

How to Test the Hips for a Perfect Squat Every Time



A report prepared by Ryan DeBell special for the Personal Trainer
Development Center (the PTDC)

The squat is a movement that has many moving parts and demands sufficient range of motion at the hips, knees, and ankle joints and associated soft tissue components.

When the squat is done as an exercise, either under heavy load or for high repetitions, the “correct” form for health, longevity, and injury prevention is principle based rather than based on a predetermined appearance of correct form.

The basic principles that a person should meet when performing a squat as an exercise are as follows:

- Pain free
- Knees track over the middle to the outside of the foot
 - Not inside or way outside the foot
- Heels stay down
- The spine stays neutral

If a person can meet those basic principles while getting to their desired squatting depth, a detailed assessment may not be the most important aspect of their training.

However, that isn't most people.

When evaluating someone's squat who can't meet the principles above, the squat needs to be broken down into its component pieces. Each joint needs to be assessed to determine what the limiting factor is for the person.

Assessing the Hip Joints

The first area to be assessed is the hip joints. Different people have different shaped femurs and different shaped hip sockets. Just looking at someone, you can't tell how their hip is shaped

and what it is functionally capable of doing.

The different shaped hip sockets can be coupled with different shaped femurs. These measurements can be combined into an aggregate measurement. These measurements are typically detailed in surgical research. We can take a more surface level approach to this topic.

Hip Scouring

The first assessment of the hip is called hip scouring.

In hip scouring, the person is lying on their back and their hip joint is moved through a full circular range of motion, looking for the position where they achieve greatest hip flexion (which functionally is where they could get the best depth in the squat).

For some people, their ‘deepest’ hip position will be with the knee going directly to their chest. For other people, the knees will have to be out to their side farther to achieve best hip motion.

Hip scouring, when performed well, can demonstrate huge variations from one person to another and is one piece of information used to help the person determine their best squat stance.

The question that comes up at this point is ‘are we assessing someone’s limitation due to their hip structure or due to muscle tightness?’

We have a way to try and sort that out. Watch the video below to see.



<https://youtu.be/Aj5MDtOIfvk>

Rotation Testing

We can test rotation of the hip joints in different positions to bias muscle versus joint.

In the first position the person will be face down. Their knee is bent to 90 degrees and then the hip is internally and externally rotated as far as it can go without the hips coming up off the ground. Check both sides to see if there is a side to side difference.

In the second part of this test the person lies on his/her back. Their hip is then flexed to 90 degrees with the knee bent at 90 degrees.

Check their hip internal and external rotation here to compare rotation of the hip flexed versus neutral.

If the overall amount of rotation is similar in both positions, it is less likely there are muscular restrictions around the joint and more likely you have true information about the joint.

Why is that?

Some hip rotators will be tight with the hip flexed and others will be tight with the hip in neutral (the face down test).

If the range of motion is similar both flexed and more neutral, the muscles were unlikely to be restricting the range of motion.

Face down:



<https://youtu.be/BhuvNOmSskM>

Face up:



<https://youtu.be/u2zYovBoSVo>

Rock Back Test

The third test to perform is called the rock back test.

In the rock back test, the person is placed on all 4's on the ground in a quadruped position. They are instructed to maintain a neutral low back while taking their hips to their heels.

If the person can perform this test while keeping their lumbar spine neutral, we know functionally both hips can flex to 90 degrees (or greater) independent of the spine and pelvis.

If they can't achieve this hip position standing (which would be 90 degrees or deeper in a squat), it isn't due to the hip joints being 'tight'.



<https://youtu.be/6jqwElkWbOU>

Adductor length test

After the rock back test, we can test the adductor length by straightening one leg out to the side from the rock back position and perform the same test (pushing the person's hips toward the heels).

This biases tension into the adductors. When the adductors cannot lengthen well, they'll either pull the knees inward while squatting or create low back rounding while squatting due to their attachments.



<https://youtu.be/BDheB5khF5U>

Lateral Lunge Test

The lateral lunge test is a way to functionally test the squatting pattern while biasing the adductors. In some circles, this movement is better known as a Cossacks squat.

The person in this test performs a Cossacks squat with a dowel placed on their back (or you can eyeball the spine position) to ensure they maintain a neutral lumbar spine.

If the person passes the adductor length test, but not the lateral lunge test, we know that either their adductors don't lengthen well under load, their knee joints are an issue, or the ankles are an issue.

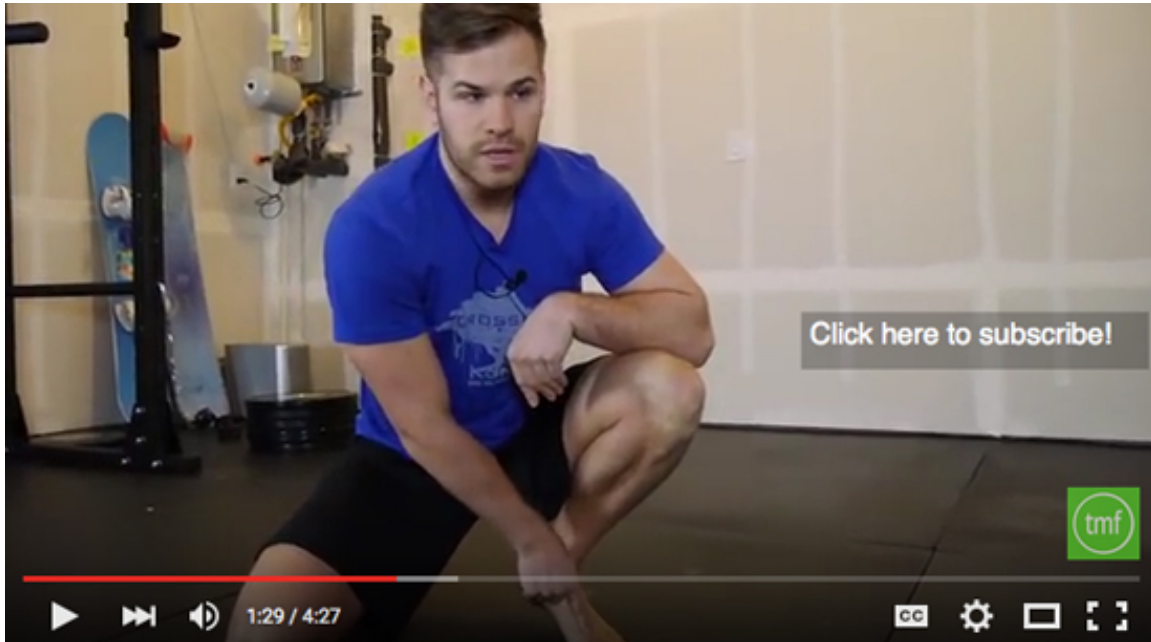


<https://youtu.be/eOx7Fmr-UPI>

Assessing Full Knee Flexion

Full knee flexion is required for deep squatting as the hamstrings approximate the calves. An easy way to test the full knee flexion is to have a person go into Japanese style sitting.

If a person can achieve this position comfortably, knee flexion isn't considered a large issue in the squat.



<https://youtu.be/yc5E5XcyMg4>

Assessing the Ankle

The ankle joints need to be assessed to rule them out as being a big limiter for a person's squat.

The easiest way to assess ankle dorsiflexion, the movement required in the ankles during squatting, is to use the inline lunge ankle dorsiflexion test.

In this test, the person faces a wall and gets down into a lunge position with the back knee resting on the ground.

A ruler is placed against the wall next to the person's front foot.

The front toes are placed against the wall and the person attempts to touch their front knee to the wall. If successful, the person continues moving his/her foot away from the wall until they can no longer touch the wall with the front foot heel staying on the ground.

The research and numbers vary on how much ankle dorsiflexion

is required in a squat. You can read that 3-5” are required for normal squatting depending on source.

In my opinion, it will vary due to several factors. For example, if someone has short legs and shallow hip sockets, they are less likely to require ankle dorsiflexion to reach a deep squat.

If a person has long femurs and a deep, retroverted hip socket, they will likely need more ankle range of motion to achieve a deep squat.



<https://youtu.be/-gwX1jepvK4>

Conclusion

There are many different squat stances that will work for different people.

So long as the squat is pain free and meets the principles listed above, having a varied width or toe out in the squat is preferred over substantially shortening depth, letting the knees collapse in, or letting the back round.

As much as we would love a standardized exam that would tell us exactly what a person needs for the squat, the world isn't so perfect and all things must be taken into context.

Want a Quick and Dirty Method?

Want an easy, less complicated way to do all of this?

Change the person's foot width and foot flare and try to directly find their most comfortable squat stance (may take up to 10 attempts) that allows the deepest position without violating the 3 principles.

There are many roads to Rome.

About the Author



Ryan DeBell, M.S., D.C. graduated summa cum laude from the University of Western States with a doctorate in chiropractic and a master's degree in exercise and sport science. He has a passion for human movement and helping people improve their health and performance. He owns and operates The Movement Fix.

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This report was compiled by Ryan DeBell (www.themovementfix.com/) for the Personal Trainer Development Center (the PTDC) to accompany the article “The Real Reason Why People MUST Squat Different” located at www.theptdc.com/2015/02/why-people-must-have-different-squat-stance/