



The Thomas Test can be used as a tool for determining healthy hip function in athletes.

# Postural Screening using the Thomas Test – Part 1

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The Thomas Test was developed in the late 1800s by British surgeon, Hugh Owen Thomas, for the purpose of assessing whether or not a patient could extend his/her hip or not. The test has often been considered the standard in determining muscle function of the hip. Initially it showed the degree of hip extension possible, but was later shown to provide other indications for a range of hip movements and problems. Thus the Thomas Test can be used as a tool for determining healthy hip function in athletes. So what does it show and how can you use it?

In the shooting posture, the position of the hips and lower back play a major role in determining upper body position. If the shooter can assume good pelvic posture then the upper body tends to follow. Coaches working with shooters can use this simple muscle function test to determine hip posture and provide basic guidance to the muscles that the shooter should stretch or strengthen. In this article I will explain the different postures a coach may see when using the test with shooters. In the next issue I will explain the basic things that you can do to assist correcting some of these problems.

The Thomas Test position can be used to determine correct function of the iliopsoas muscle group, the rectus femoris, the tensor fascia latae and the sartorius muscle.

The Iliopsoas muscle group are hip flexors that allow you to bend your hip and bring your knee up to your chest.

The Rectus Femoris is a large hip flexor and knee extensor muscle on the front of the thigh that allows you to straighten the knee joint.

Tensor Fascia Latae (TFL) is a small muscle situated on the outer top thigh, is a hip abductor and also assists in hip flexion, hip internal rotation and knee extension.

Sartorius Muscle is a long tape like muscle that goes from the hip bone on the outside down and across to the inside of the knee. It functions in hip flexion, abduction, external rotation and in knee flexion.

### **The Thomas Test is performed as follows:**

Seat the subject at the end of a table and allow him/her to lower the body to a lying position on the back. The subject then uses his/her hand to bring one thigh towards the chest only enough to allow the lower back to flatten and the Sacrum to rest flat on the table. The opposite leg is then allowed to relax and the behaviour of the relaxed leg is determined.



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As there are four different muscles acting on this position there are a number of possible variations that can occur and require understanding.

## NOTE:

Normal range of movement in hip extension is 10 degrees and in subjects with normal range of hip extension, the lower back will flatten when lying supine. In order to nullify such differences the subject is asked to bring his/her raised leg up to the chest until he/she feels that his/her lower back is flat hence removing the error associated with the 10 degrees and creating consistency in testing.

### Normal length of the hip flexors



When a subject shows a normal length of the hip flexors, the lower back and sacrum should be flat on the table, which accounts for a 10 degrees posterior tilt or the equivalent of 10 degrees hip extension. The thigh should be parallel to the table and the knee should be bent at 80 degrees flexion (nearly a right angle). This shows normal length of the hip flexors and normal length of rectus femoris at 80 degrees knee flexion.

### Shortness of both one joint and two joint hip flexors



When the subject remains in the correct position, shortness of both one and two joint hip flexors is indicated by the thigh being above horizontal position and the knee being bent at less than 80 degrees.

### Normal length of one joint and shortness of two joint hip flexors



With the starting position being held and the lower back and sacrum remaining flat on the table, normal length of the one joint hip flexors will be indicated by the thigh remaining horizontal to the table. Shortness of the two joint hip flexors will be indicated by the knee being unable to achieve 80 degrees of flexion.

Further testing by the trainer can be achieved by exerting downward pressure on the thigh and determining whether the thigh can achieve a horizontal position and if this causes the knee to extend further. If this is possible, it shows how the two joint hip flexors interfere with normal one joint hip flexor length.

### Shortness of one joint and normal length of two joint hip flexors



This position is indicated by the thigh remaining above horizontal position and the knee bending further than or equal to 80 degrees. If the knee can be manually flexed beyond normal 80 degrees it shows better than normal range of the two joint flexors and if the thigh remains above horizontal, it shows limited range or tightness of the one joint hip flexors.

### Shortness of Tensor Fascia Latae during Thomas Test



Shortness of the TFL can be indicated by any combination of the following.

- ▶ Increased abduction of the hip as seen from above, as the hip is placed into extension. The more the hip is extended the amount of abduction will increase.

- ▶ The patella will tend to move laterally as the thigh extends due to the tension of the TFL on its normal position.
- ▶ The thigh may tend to rotate internally.
- ▶ If the leg is unable to abduct, the tension in TFL may cause the knee to extend more than normal

### Shortness of Sartorius



Shortness of the Sartorius muscle can be indicated by any combination of three or more of the following actions.

- ▶ Abduction of the hip taking the knee out to the side.
- ▶ Flexion of the hip causing the knee and thigh to raise above horizontal position.
- ▶ External rotation of the hip taking the knee outside that of the foot when viewed from the top.
- ▶ Increased flexion of the knee beyond its normal position if the hip does not abduct.

In Part 2, I will explain what stretches and strengthening exercises you could suggest when one of your shooters demonstrate a hip posture similar to the pictures shown above. Over the next few weeks make an effort to test your shooters and just gain a better insight into the type of posture they may have by trying to match the posture with the pictures show. Once you see the differences you will be ready to provide advice on appropriate exercises. 🔄