

## ***Section 4***

### **Muscles and Movements**

## HIP FLEXORS

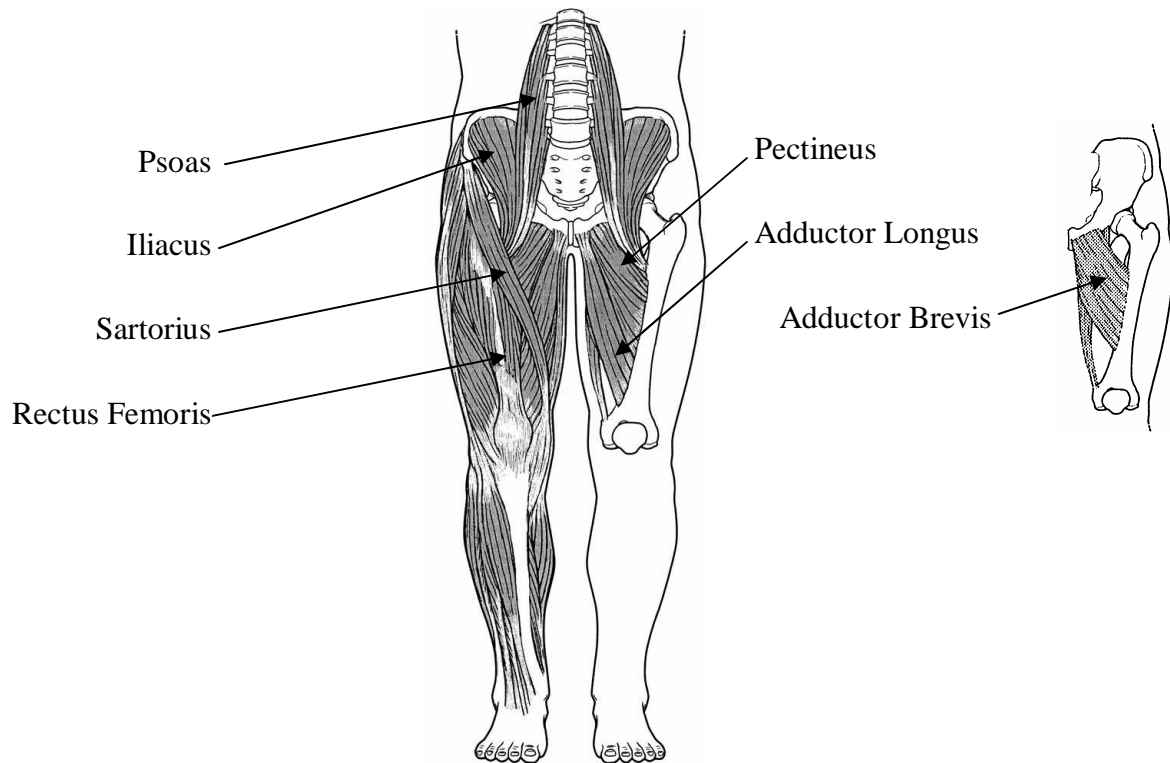


Figure 4-1a. Hip Flexors.

The hip flexor muscles (also known as thigh flexors) are a group of seven muscles located on both sides of the body. Their names are: 1) Psoas, 2) Iliacus, 3) Sartorius, 4) Vastus Rectus (a.k.a Rectus Femoris), 5) Adductor Longus, 6) Adductor Brevis and 7) Pectineus. See Figure 4-1a above.

The hip flexors main function is to flex the thigh upon the pelvis. This occurs during activities such as running, jumping, and walking. This is illustrated below in Figures 4-1b and 4-1c.



Figure 4-1b. Neutral hip position.



Figure 4-1c. Hip flexion.

## HIP EXTENSORS

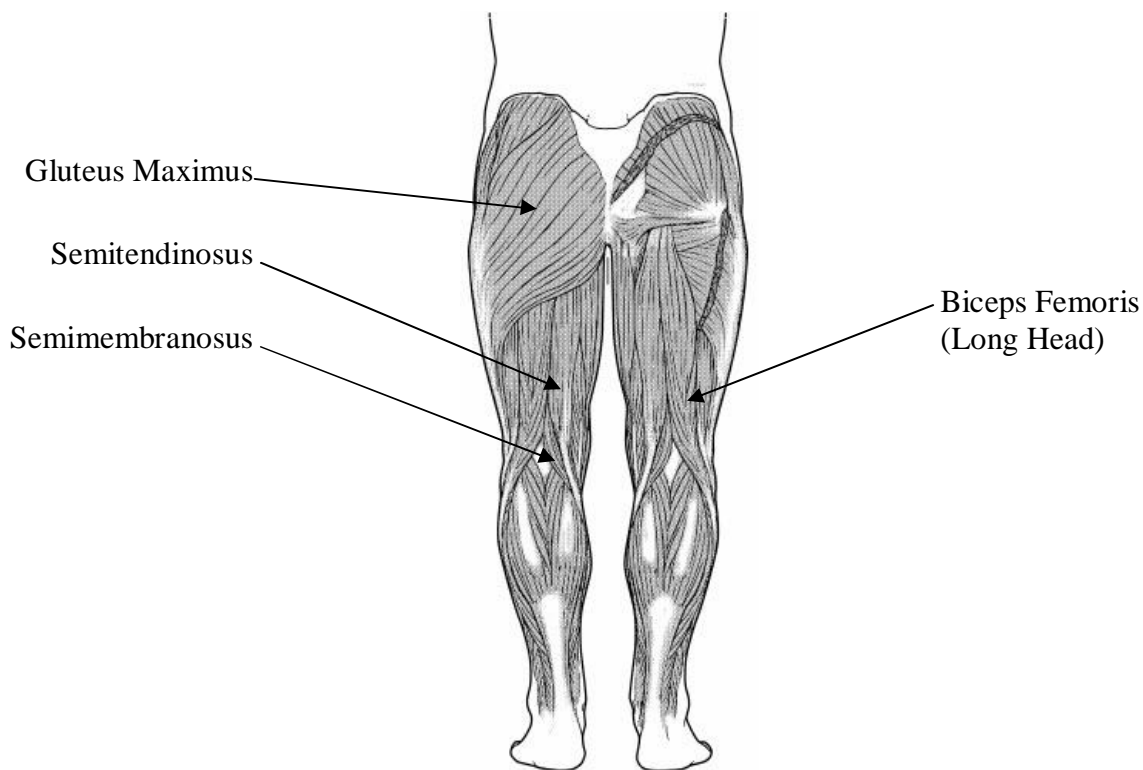


Figure 4-2a. Hip Extensors.

The hip, or thigh, extensors consist of 4 muscles located in the buttocks region and posterior thigh. Their names are: 1) Gluteus Maximus, 2) Semimembranosus, 3) Semitendinosus, and 4) Long Head of Biceps Femoris. See Figure 4-2a above. Note: The Semimembranosus, Semitendinosus and Biceps Femoris are commonly known as the hamstrings.

The main function of the hip, or thigh extensors, is to extend the thigh behind your body. This occurs during activities such as running, jumping, kicking, walking, skating, and swimming. This is illustrated below in Figures 4-2b and 4-2c.



Figure 4-2b. Neutral hip position.



Figure 4-2c. Hip extension.

## HIP ABDUCTORS

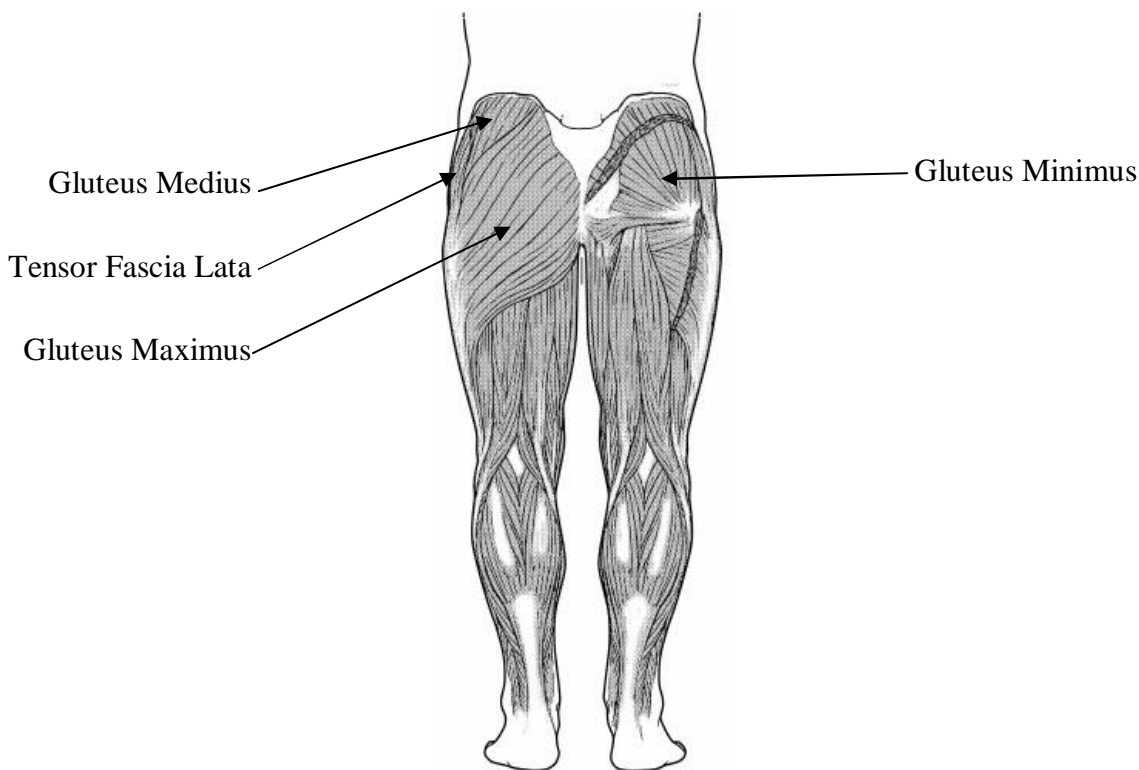


Figure 4-3a. Hip Abductors.

The hip abductors are a group of four muscles located in the buttocks region and lateral hip on both sides of the body. Their names are: 1) Gluteus Maximus, 2) Gluteus Medius, 3) Gluteus Minimus and 4) Tensor Fascia Lata. See Figure 4-3a above.

The hip abductors main function is to abduct, or separate, your legs away from the midline of the body. This occurs during any athletic movement requiring you to move from side to side such as playing the infield in baseball, defense in soccer, basketball and football, and ice skating. This is illustrated below in Figures 4-3b and 4-3c.



Figure 4-3b. Neutral hip position.



Figure 4-3c. Hip abduction.

## HIP ADDUCTORS

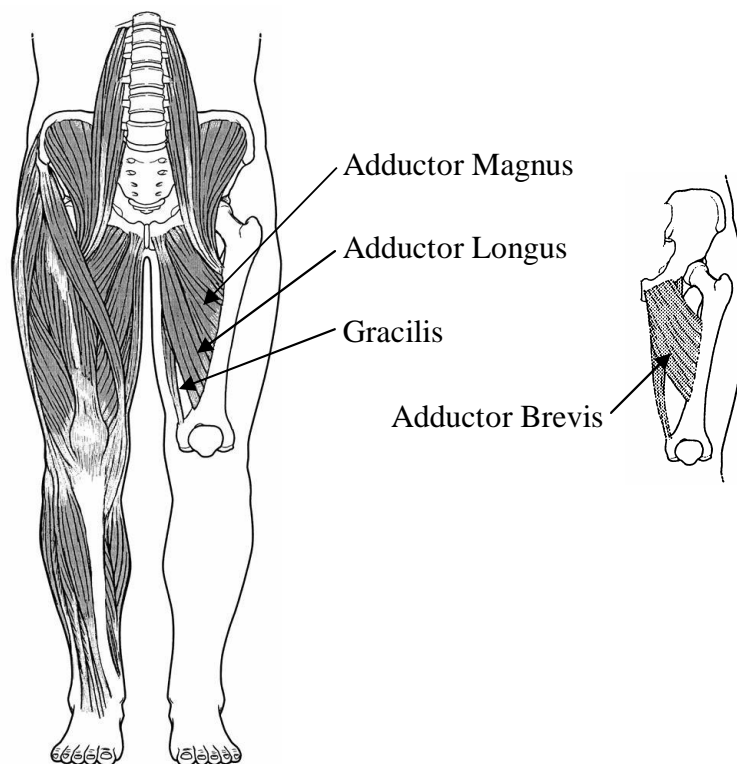


Figure 4-4a. Hip Adductors.

The hip adductors are a group of four muscles located in the medial thigh region on both sides of the body. Their names are: 1) Adductor Longus, 2) Adductor Brevis, 3) Adductor Magnus and 4) Gracilis. See Figure 4-4a above.

The hip adductors main function is to adduct or bring your legs towards the midline of the body as well as to cross one leg over the other. This occurs during any athletic movement requiring you to move from side to side such as playing the infield in baseball, defense in soccer, basketball and football, and ice skating. They are also used in activities such as horseback riding where inward pressure by your thighs is required to maintain a firm and stable riding posture. This is illustrated in Figures 4-4b and 4-4c.



Figure 4-4b. Neutral hip position.



Figure 4-4c. Hip adduction.



## HIP ROTATORS, EXTERNAL

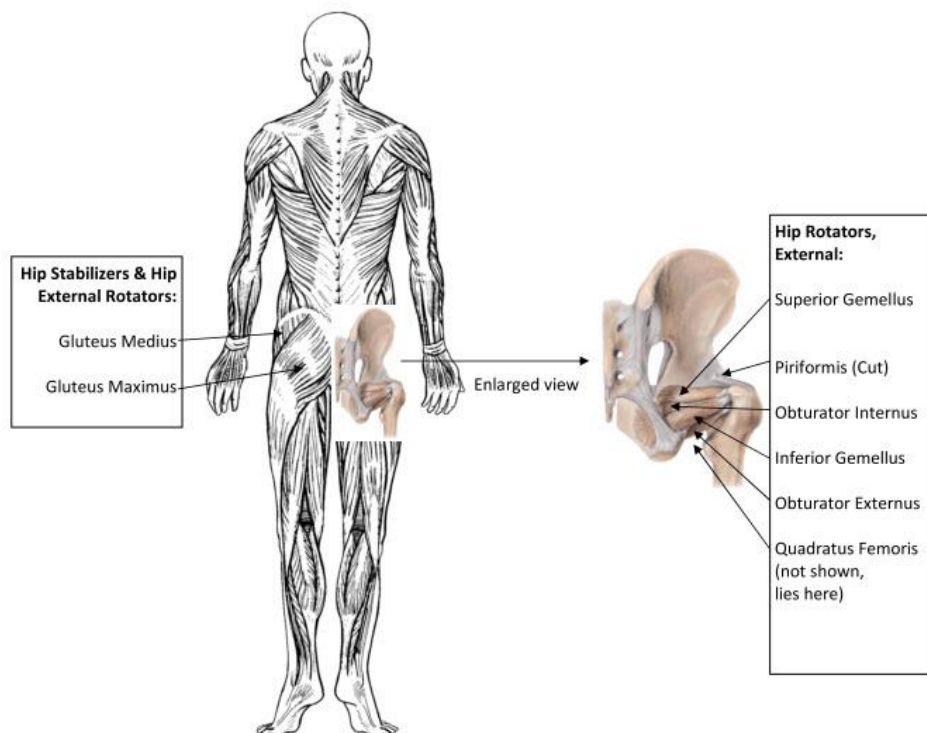


Figure 4-5a. Hip Rotators, External

The external hip rotators are a group of eight muscles located in the buttocks region on both sides of the body. Their names are: 1) Gluteus Medius, 2) Gluteus Maximus, 3) Superior Gemellus, 4) Piriformis, 5) Obturator Internus, 6) Inferior Gemellus, 7) Obturator Externus, and 8) Quadratus Femoris. See Figure 4-5a above.

The external hip rotators function to rotate the front, or anterior region, of your thigh outward, away from the midline of your body, as shown below in Figures 4-5b and 4-5c.



Figure 4-5b. Neutral hip position.



Figure 4-5c. External Hip Rotation.

## HIP ROTATORS, INTERNAL

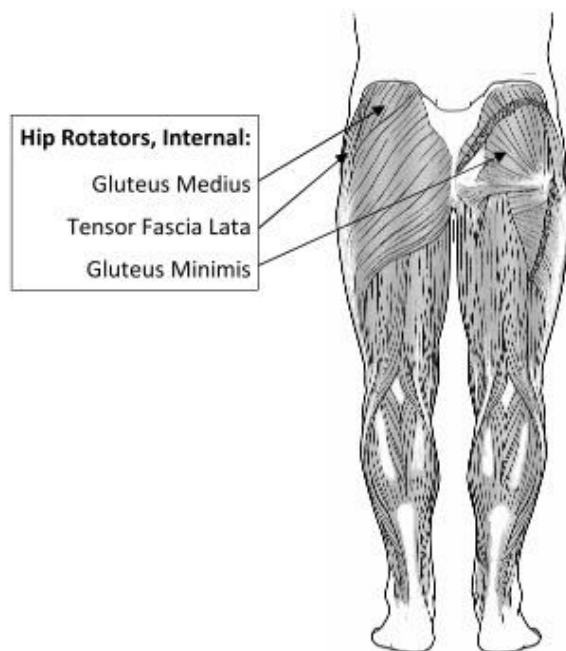


Figure 4-6a. Hip Rotators, Internal

The internal hip rotators are a group of three muscles located in the buttocks and lateral hip region on both sides of the body. Their names are: 1) Gluteus Medius, 2) Gluteus Minimus, and 3) Tensor Fascia Lata. See Figure 4-6a above.

The internal hip rotators function to rotate the front, or anterior region, of your thigh inward, toward the midline of your body, as shown below in Figures 4-6b and 4-6c.



Figure 4-6b. Neutral hip position.



Figure 4-6c. Internal Hip Rotation.

## KNEE EXTENSORS (QUADRICEPS)

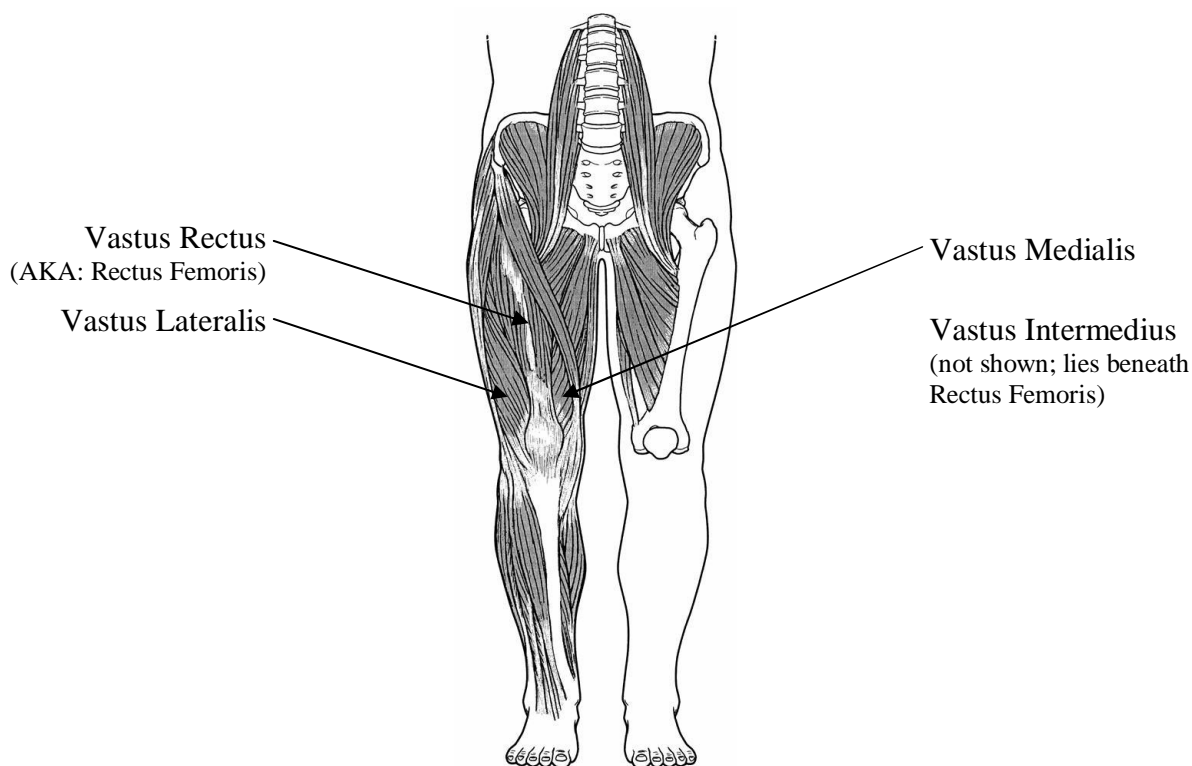


Figure 4-7a. Knee Extensors.

The knee/leg extensors are a group of four muscles located in the anterior thigh region on both sides of the body. Their names are: 1) Vastus Rectus (a.k.a. Rectus Femoris), 2) Vastus Medialis, 3) Vastus Lateralis and 4) Vastus Intermedius. They are commonly known as the quadriceps, or quads. These muscles are shown in Figure 4-7a above.

The quadriceps main function is to extend the leg at the knee. This occurs during activities such as running, jumping, kicking, standing and walking. This is illustrated below in Figures 4-7b and 4-7c.



Figure 4-7b. Knee flexion while standing.



Figure 4-7c. Knee extension while standing.



## KNEE FLEXORS (HAMSTRINGS)

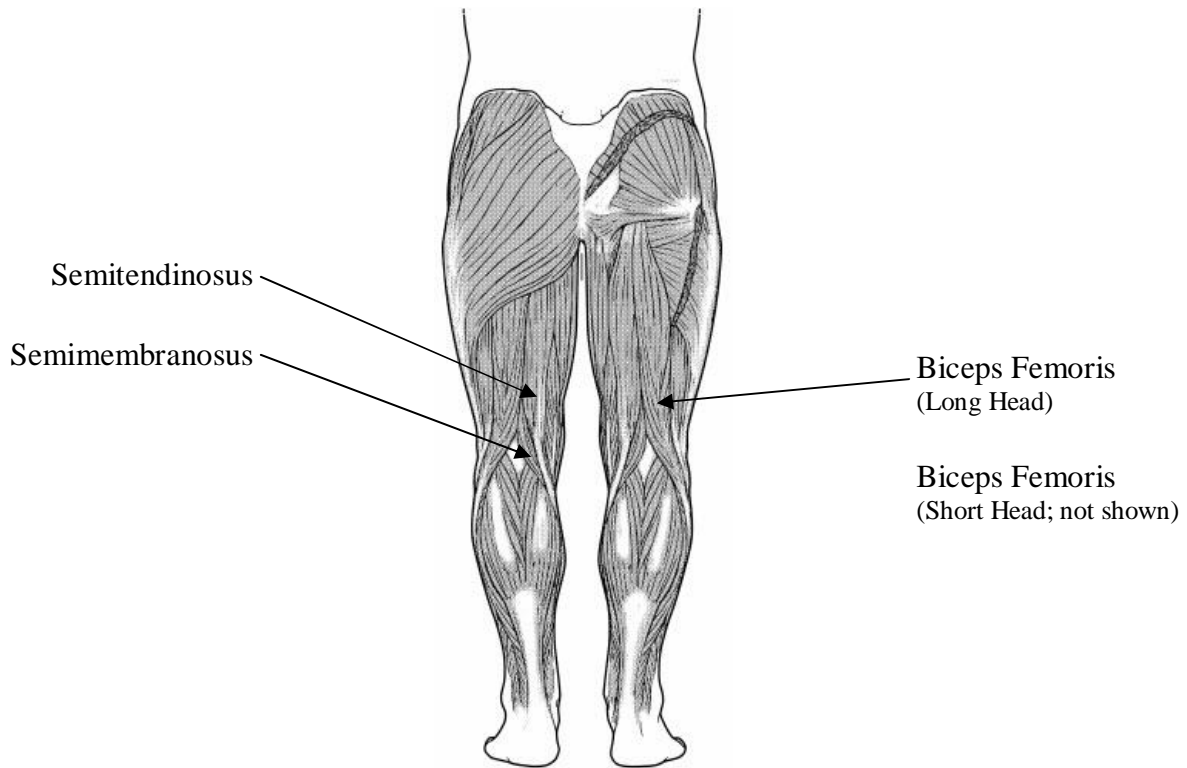


Figure 4-8a. Knee Flexors.

The knee/leg flexors are a group of three muscles located in the posterior thigh region on both sides of the body. Their names are: 1) Semitendinosus, 2) Biceps Femoris (both the long head and the short head are knee flexors since both cross the knee joint) and 3) Semimembranosus. They are commonly known as the hamstrings. See Figure 4-8a above.

The knee flexors function is to flex the lower leg/calf behind the thigh as shown below in Figures 4-8b and 4-8c.



Figure 4-8b. Neutral position.



Figure 4-8c. Knee flexion.

## LATERAL SPINE ROTATORS

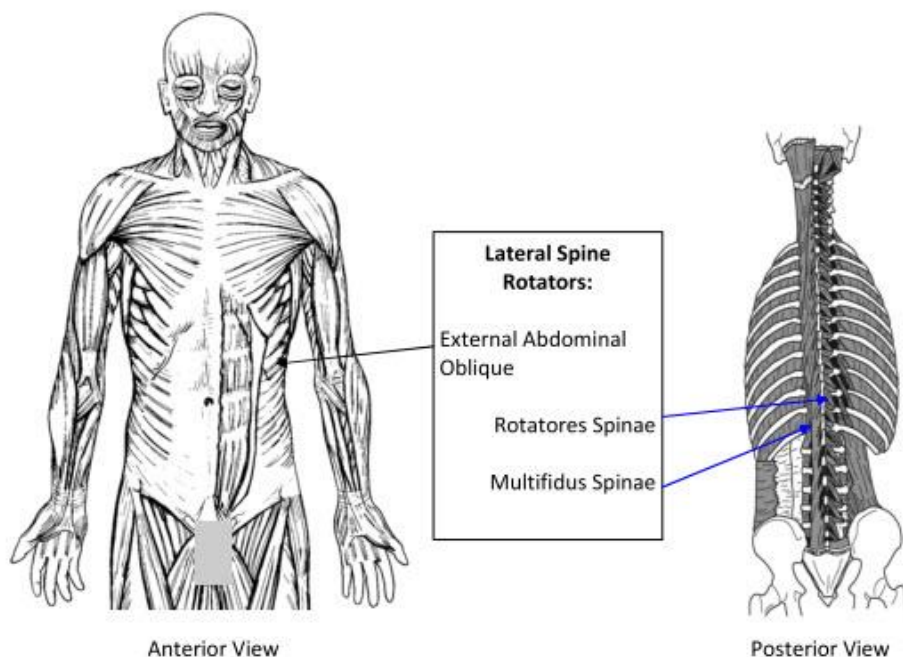


Figure 4-9a. Lateral Spine Rotators.

The lateral spine rotators are a group of three muscles located in the posterior thoracic and lumbar spines and abdomen, bilaterally. Their names are: 1) External Abdominal Oblique, 2) Rotatores Spinae (eleven small muscles on each side of body) and 3) Multifidus Spinae. See Figure 4-9a above.

The lateral spine rotators function to rotate your upper body to the opposite side of where the contraction is taking place. In Figure 4-9b below the athlete is performing a sit-up where the front of his upper body has rotated to his left. This action is caused by contraction of the lateral spine rotators on his right side.

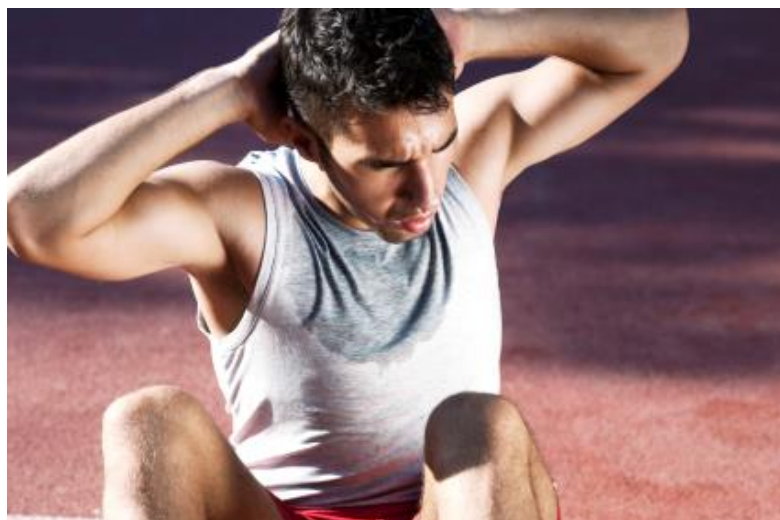


Figure 4-9b. Contraction of the lateral spine rotators on the right.