Our musculoskeletal system is a complex machinery of bones, joints, muscles, and their auxiliaries, which serve as the body’s supporting structure and give the body the ability to move. Our skeletal muscles provide the moving strength and may be low or high in their muscle tone. They have different courses from origin to insertion and also differ in their function. In the following article, you will receive a concise overview of 10 important muscles of our musculoskeletal system.

Deltoid Muscle

The deltoid muscle was named after the Greek letter “delta” because of the similar triangular shape they both share.

Location:

It is the muscle forming the round contour of the shoulder and is located on the outer aspect of the shoulder. The outside and center of the upper arm is the top of the muscle triangle, the base is on the spina scapulae and the acromion is fixed to the clavicular.

Origin:
The muscle has three heads:

- Pars clavicularis (collarbone part) – anterior muscle portion that originates from the lateral third of the clavicle.
- Pars acromialis (acromial part) – middle muscle portion
- Pars spinalis (spinal part) – posterior muscle portion that arises from the scapula.

Insertion:

- They all insert laterally on the humeral shaft on the deltoid tuberosity.

Function:

- The deltoid muscle is the strongest abductor (moving away from an extremity from the midline of the body) in the shoulder joint.

Nerve supply:

- The muscle is supplied by the brachial plexus via the axillary nerve.

![Deltoid muscle](image)
The patient lies on his back and has his arm abducted to 90° at the shoulder joint as well as flexed at the elbow (lat. flexion = bend), then the **examiner immobilizes the shoulder** and applies resistance on the distal upper arm towards the table.

**Pars acromialis:**

![Image](https://example.com)  
*Image: “Position of the examiner for isometric testing of m. deltoideus.” by Openi. License: CC BY 2.0*

The patient is seated and the arm to be tested is flexed to 90° at the elbow joint. To test the part of the muscle, the **examiner applies pressure on the distal upper arm** in the direction of the adduction. The test can be performed simultaneously with both arms.

**Pars spinalis:**

In the prone position, the patient abducts his arm at the shoulder joint to 90° and lays his upper arm on the examination table and lets his forearm hang vertically over the edge of the table. The **examiner immobilizes the scapula with one hand and, with the other, he applies pressure on the elbow** in the direction of the table in order to test this part of the deltoid muscle.

**Function and Innervation of the Deltoid Muscle**

With its three different parts, the deltoid muscle is **involved in all acromioclavicular movements**. Due to a very complex pinnation and a very large physiological cross-section at a relatively small volume, it is the most important abductor.

In the event of isolated tension, the **pars clavicularis causes an anteversion** (lat. ante = before; vertere = turn) and internal rotation of the humerus in the shoulder joint.

The **pars spinalis of the deltoid muscle, on the other hand, causes a retroversion (lat. retro = back) in isolated tension** (lat. retro = back) and outward rotation of the humerus in the shoulder joint. In conjunction with the pars spinalis, they can, therefore, act antagonistically (Greek antagonistēs = opponents, adversaries) in an adducted arm (move an extremity towards the midline of the body) to the pars acromialis and therefore as strong adductors. With an insufficient pars acrominalis as an abductor, they continue to lead in the abduction the already abducted arm.

**Abduction of the arm is made possible by the pars acromialis** with the supraspinatus muscle centralizing the head of the humerus in the joint socket.

In summary, the **functions of the deltoid muscle** are as follows:
Pars clavicularis
- Anteversion
- Internal rotation
- Adduction

Pars spinalis
- Retroversion
- External rotation
- Adduction

Pars acromialis
- Abduction

The axillary nerve is responsible for the innervation of the deltoid muscle.

**Note:** The deltoid muscle is a segment-indicating muscle for the spinal cord segment C5, i.e., in the event of a failure, a clear conclusion can be drawn to the location of a nerve lesion.

Infraspinatus Muscle

Localization of the infraspinatus muscle

![Image](Image: "A picture of both shoulders from the back showing muscle atrophy on the left side (arrow) obtained at the patient’s six-month follow-up examination." by Openi. License: CC BY 2.0)

The infraspinatus muscle is one of the four muscles that comprise the rotator cuff, it covers the larger part of the infraspinous fossa of the scapula where it originates and inserts over the back side of the shoulder joint capsule into the greater tubercle of the humerus. Only a small part of its belly (venter) comes up to the surface in the triangle between the trapezius, deltoid and teres minor muscles. Frequently, the infraspinatus is fused with the teres minor, which extends along its bottom rim.

Muscle Performance Test of the Infraspinatus Muscle

The muscle performance test of the infraspinatus muscle can be done sitting, standing, in a prone and supine position. The patient moves the arm in a 90° abduction with a 90° flexion in the elbow and maximum external rotation of the humerus. The examiner then applies pressure with a soft touch on the dorsal side of the patient’s forearm towards the internal rotation and stabilizes the elbow with the other hand.
Function and Innervation of the Infraspinatus Muscle

The infraspinatus muscle is used for external rotation. It carries out a strong external rotation, especially in the last stage of the abduction when the insertion of the muscle is turned outwards so that it does not hamper the continuation of the abduction by touching the coracoacromial arch (fornix humeri). With its cranial part, it abducts the upper arm and adducts with its caudal fibers.

The suprascapular nerve is responsible for the innervation of the infraspinatus muscle.

The infraspinatus tendon is found in close association with the shoulder joint with a bursa separating the two.
Pectoralis Major Muscle

Location of the Pectoralis Major Muscle

The pectoralis major is the large chest muscle of our skeletal muscles. It takes up the anterior chest wall, between the front axillary folds and the breastbone (sternum) and between the rectus sheath and the collarbone (clavicle). The outline of the muscle is very easily recognized in men and children due to its superficial location, whereas in women it lies covered under the breast.

According to the origin, a distinction is made between the 3 parts of the pectoralis major:

- Pars clavicularis (clavicular — collarbone part)
- Pars sternocostalis (sternocostal — breastbone-rib part)
- Pars abdominalis (abdominal part)

Origin:

The clavicular head originates from the anterior surface of the medial head of the clavicle.

The sternal head originates from the lateral aspect of the manubrium sterni, upper six costal cartilages and the aponeurosis of the abdominal oblique muscle. This forms the main part of this muscle.

The abdominal part is the smallest part. This one originates in the extension of the anterior axillary fold from the cranial end of the rectus sheath.

On the crest of greater tubercle (crista tuberculi majoris humeri), all parts of the muscle arise with a common aponeurosis.

Muscle Performance Test of the Pectoralis Major Muscle

Pectoralis clavicularis (PMC)

The pectoralis clavicularis (PMC) originates from the anterior surface of the medial half of the clavicle. The main part of the muscle that comes from the sternal border and from the adjacent costal cartilages forms the pectoralis sternalis (PMS). The abdominal part is the smallest part. This one originates in the extension of the anterior axillary fold from the cranial end of the rectus sheath.

On the crest of greater tubercle (crista tuberculi majoris humeri), all parts of the muscle arise with a common aponeurosis.
Muscle Performance Test of the Pectoralis Major Muscle

**Pectoralis Clavicularis (PMC):**

To test the part of the muscle, the supine position is the most appropriate, but also standing, sitting or the prone position are adequate for this muscle performance test.

1. The patient begins the test with an **anteflexion in the shoulder joint until he reaches 90°** with maximum extension in the elbow and stretches out the arms with a maximum internal rotation so that the thumbs point to the toes. Testing of the arms can also be done unilaterally.

2. To perform the test, the patient is asked to **press the arm towards the contralateral shoulder** and the examiner makes a soft contact on the distal forearm and pushes towards the abduction with minimal extension of the shoulder.

**Note:** If the patient tries to flex the arm at the elbow in order to activate the long biceps tendon, it indicates a sign of weakness.

**Pectoralis Sternalis (PMS):**
The pectoralis sternalis is best to test in the supine position. Again, the patient begins the test with an anteflexion in the shoulder joint until he reaches 90° with a maximum extension in the elbow and extends the arm with a maximum internal rotation so that the thumb points to the toes. To test this muscle part, the patient presses the straight arm towards the contralateral hip and the examiner presses with soft contact on the distal forearm towards abduction and flexion.

**Pectoralis Abdominalis:**

The patient is in a supine position and abducts the arm at the shoulder joint about 120°, then the examiner holds the shoulder with one hand and applies pressure on the distal upper arm towards the examination table with the other. To test the muscle, the patient now pulls the arm against the resistance of the examiner on his abdomen and holds the end position.

**Function and Innervation of the Pectoralis Major Muscle**

For better understanding, we assume that the pectoral girdle stiffens and the muscles take action from this punctum fixum of the shoulder joint.

The pectoralis major muscle then deploys the following **effects:**

- Adduction
- Anteversion
- Retroversion
- Internal Rotation

From any joint position, the pectoralis major is the **strongest adductor** of the arm. Without its participation, we would not be able to cross our arms in front of our chest or to put a hand on the contralateral shoulder. The arm stroke while swimming breaststroke would be unthinkable.

During **anteversion**, all muscle parts (pars clavicularis, pars sternocostalis, and pars abdominalis) pull the arm from the most extreme retroversion into the zero position. Lifting the arm further to the 90° mark, starting with the lowest (pars abdominalis) more and more upper parts drop out and are extended. The clavicular manages to approach the 90°.

In **retroversion**, the following applies: The pars abdominal and the pars sternocostalis can, for instance, retrovert the arm against resistance from anteversion into a neutral...
position. Furthermore, due to its insertion on the humerus, the abdominal part can indirectly lower the scapula and, with fixed arms, it can be used as respiratory muscle.

Internal rotation is possible in all parts of the muscle and in all joint positions.

The medial pectoral nerve innervates the abdominal and the sternocostal part. Additionally, the sternocostal and clavicular parts are stimulated by the lateral pectoral nerve.

**Note:** The pectoralis major muscle is also the so-called “hugging muscle” as all of its possible actions are carried out in an embrace. Anteversion is followed by the transition to retroversion, adduction and internal rotation.

## Latissimus Dorsi Muscle

### Localization of the Latissimus Dorsi Muscle

The latissimus dorsi muscle originates from a broad aponeurosis (flat structure of connective tissue that serves as a tendon to attach one or more muscles), which extends from the spinous processes of the lower six thoracic vertebrae over the lumbar vertebrae to the posterior rim of the os ilium. In addition, the muscle also originates from the lower three to four ribs and the inferior angle of the scapula.

The crest of the lesser tubercle of the humerus is the insertion point of the latissimus dorsi. The muscle approaches this point as it turns spirally around the teres major as part of the rear axillary fold, moves on between the trunk and the humerus thereby twisting around itself.

### Muscle Performance Test of the Latissimus Dorsi Muscle

The muscle function test can be performed while standing, sitting, as well as in the supine and prone positions. The patient extends his arm to a maximum and rotates it internally so that his thumbs points to the body and his arm is approx. 20° away from the
body. The patient now moves towards abduction and the examiner with light contact against the distal forearm in the direction of abduction. There should be no pain caused by the examiner.

**Function and Innervation of the Latissimus Dorsi Muscle**

The latissimus dorsi muscle is an important muscle for being able to use walking aids and with regard to any kind of activity in which the body is pulled in the direction of the arms, for example, climbing.

The latissimus dorsi muscle has **3 essential functions:**

- Retroversion
- Adduction
- Internal rotation

Internal rotation occurs because this muscle pulls the humerus towards the trunk. It thus supports the internal rotation and adduction of the humerus. Furthermore, the muscle is used for retroversion by lowering the elevated arm forcefully, for example, when wood chopping.

The muscle is also needed for forced **expiration** (coughing and sneezing) as well as deep **inspiration** (inhalation).

The latissimus dorsi muscle is innervated by the thoracodorsal nerve.

**Iliopsoas Muscle**

**Localization of the Iliopsoas Muscle**

The iliopsoas muscle is actually made up of two muscles, each having a different origin but a common insertion point just distal of the **lesser trochanter** and similar functions.

Almost on the very inside lies the iliopsoas, made up of two heads coming from the
iliacus muscle and the psoas major muscle. The iliacus covers with one head the entire inner side of the iliac bone like a thick muscle plate; while the other head, the psoas major, is located adjacent to the inside of the posterior wall of the abdominal cavity next to the spine. This is also where the psoas major has its origins since it lies in the angle between the vertebral body and the transverse processes. The iliacus arises from the upper two-thirds of the iliac fossa inside the upper pelvic rim, the ala of the sacrum, as well as the sacroiliac, lumbosacral and iliolumbar ligaments.

The already merged iliopsoas passes from the anterior iliac spine between the upper pelvic rim and the inguinal ligament, leaves the inner body to extend across the arch of the hip joint, and finally reaches its point of insertion on the lesser trochanter.

Muscle Performance Test of the Iliopsoas Muscle

The perfect position for the iliopsoas muscle performance test is the supine position.

The patient lies down on the table and extends the fully externally rotated leg at about 45° of flexion and abduction. The examiner places a stabilizing hand softly but firmly on the contralateral side of the pelvis in order to prevent the patient from rolling across to the side of the tested muscle.

With the other hand, the examiner has contact with the distal femur, the medial knee joint or the medial condyle of the tibia. A larger lever can be chosen, especially with strong patients, by placing the contact distally on the lower leg.

The test is carried out towards extension and light abduction, whereby the patient presses in the direction of flexion and adduction.

Alternatively, with appropriate stabilization, the muscle can also be examined while standing or sitting.

Function and Innervation of the Iliopsoas Muscle

The iliopsoas muscle is the strongest flexor of the hip joint and therefore an irreplaceable walking muscle; without it, one would not be able to lift a leg (anteflexion in the hip). Altogether, a failure of the muscle cannot be compensated by any other muscle. Consequently, it is one of the most important muscles.

Additionally, the iliopsoas muscle can abduct the leg from the abducted position up to the neutral position. Normally, its rotation is directed inwards; however, a minimum external rotation is also possible in other joint positions.

The femoral nerve is responsible for the innervation of the iliac muscle. The psoas major, however, is supplied by ventral rami.

Note: The iliopsoas muscle is the most important hip flexor. Failure of this muscle cannot be compensated by any other muscle.

Tensor Fasciae Latae Muscle (TFL)

Localization of the Tensor Fasciae Latae
The tensor fasciae latae muscle, also called the sprinter muscle, lies laterally to the gluteus maximus muscle in the upper layer of the gluteal muscles and is separated from it by the iliotibial tract. The iliobibial tract is, at the same time, the insertion point of the muscle. The muscle originates lateral from the anterior superior iliac spine, on the upper rim of the iliac bone. In its course from the anterior superior iliac spine to the anterolateral surface of the femur, the muscle is characterized by its elongated flat muscle belly, which is clearly visible through the skin in many people.

**Muscle Performance Test of the Tensor Fasciae Latae Muscle**

The perfect position for the tensor fasciae latae performance test is the supine position.

The patient extends his knee maximally and is brought by the examiner into a position of abduction, internal rotation and flexion of about 30° at the hip joint.

Subsequently, the patient pushes his leg outward and upward, in the direction of further abduction and flexion. The examiner has contact with one hand on the distal lower leg and the other hand on the table for stabilization and he applies a test pressure in the direction of adduction and extension in the direction of the other leg.

The contact to the ankle joint should be avoided.

**Function and Innervation of the Tensor Fasciae Latae**

In order to flex and to abduct the leg at the hip joint, the tensor fasciae latae muscle supports the movement. However, there are much stronger synergists, such as the gluteus medius or gluteus minimus that are readily available for carrying out the movement of abduction.

The TFL is especially important as a strong internal rotator on the hip, whereby it can also balance the external rotation effect of the gluteus maximus at the iliotibial tract.
If necessary, the muscle can, at least partially, replace a paralyzed quadriceps femoris, as the extension on the knee joint, which is mediated through the tract, is strong enough.

The tensor fasciae latae muscle is innervated by the superior gluteal nerve.

**Rectus Femoris Muscle**

**Localization of the Rectus Femoris Muscle**

![Image: "Rectus Femoris" by Uwe Gille. License: Public Domain](image)

The **rectus femoris muscle** represents one of the four parts of the **quadriceps femoris muscle**, the strongest muscle in the body.

As the only head of the quadriceps that has two articulations, it has its origin on the **anterior superior iliac spine**. A small transverse portion also extends to the upper edge of the **acetabulum and to the hip joint capsule**.

The muscle inserts together with other parts of the quadriceps femoris on the **patella as the tendon of the quadriceps femoris**.

In spite of its large overall length, the muscle has short muscle fibers that are only a few centimeters long. Due to the physiology of the fibers, the muscle may be in certain combinations of positions either actively or passively insufficient.

An **active insufficiency** occurs when the rectus has extended the knee so that its remaining capacity for shortening is no longer sufficient to flex the hip joint as well. A **passive insufficiency** occurs when the hip and knee joint, subject to an extension of the rectus, move beyond a certain degree. The rectus’ fibers are too short and would tear if extended all the way up to the end of both joints. Anatomically, it is not possible to extend the hip to a maximum and have the knee completely flexed at the same time.

The insertion of the muscle is located at the upper border of the **patella in the patellar ligament** and reaches the tibial tuberosity.
Muscle Performance Test of the Rectus Femoris Muscle

It is best to test the rectus femoris in the supine position, but it can just as well be tested while sitting or standing. In the supine position, the patient brings his leg to a position of 90° knee flexion and 90° flexion in the hip joint. The examiner has contact on the distal femur, and when examining the muscle, he presses the thigh in the direction of straight extension.

**Note:** Any rotation must be avoided. Also, the angle of the knee should not be changed. With very muscular patients, the examiner can also support himself on the table or use both hands to provide support in the form of a locking mechanism.

Function and Innervation of the Rectus Femoris Muscle

The rectus femoris muscle has **3 essential functions:**
- Extension
- Flexion
- Abduction

As already mentioned, the rectus femoris strongly flexes at the hip and extends in the knee, both of which are needed in the forward swinging of the free leg. During slow walking, the muscle is the main hip flexor, whereas when standing on both feet, it is barely tensed. The rectus femoris has a weak effect as adductor in the hip.

The rectus femoris muscle is innervated by the femoral nerve.

Sartorius Muscle (the Tailor’s Muscle)

Localization of the Sartorius Muscle

The sartorius muscle originates at the **anterior superior iliac spine**, running in a slight S-shaped curve like a long belt across the front and inner part of the thigh and passing in
a dorsomedial direction (= to the back and middle of the body) over the knee towards the lower leg.

Down the knee, the sartorius merges into a fan-shaped aponeurosis, from the tibial tuberosity to the middle of the lower leg on the free tibial surface. Together with the gracilis and semitendinosus muscles, it forms part of a common tendon. The three thick main strands are connected by an aponeurotic membrane and form the pes anserinus, the insertion point of the sartorius on the medial side of the tibia.

**Muscle Performance Test of the Sartorius Muscle**

The best way to perform the performance test is in the supine position.

Taking the example of the right leg, the examiner holds with his left hand the knee from the outer side and, with his right hand, the distal lower leg from the medial side just above the malleolus (partly on the upper ankle joint).

Subsequently, the patient’s leg is brought into approx. 30° – 45° abduction with maximum external rotation, slight flexion in the hip joint and simultaneous flexion in the knee joint. According to this, the patient’s right foot is now at approximately the same level as the opposite left knee.

The examiner will start with the test pressure, and the patient will push against him with maximum resistance.

**Note:** If the patient tries to only flex in the knee over the hamstring group or use the other abductors in the hip joint for abduction, this constitutes an indication of the weakness of the sartorius muscle.

**Function and Innervation of the Sartorius Muscle**

The sartorius muscle has an important stabilizing function for the medial side of the knee, as well as for the iliac bone in an anterior direction.

Acting on the hip joint, the sartorius muscle assists as a flexor, outward rotator, and abductor. At the knee joint, the sartorius muscle helps to flex and rotate inwards.

When all these movements are carried out simultaneously, the legs will cross in a sitting position in which tailors were known to sit while working. The sartorius is therefore also known as the tailor’s muscle.

Like the rectus femoris muscle, the sartorius muscle is also innervated by the femoral nerve.

**Note:** The sartorius muscle is the only muscle that flexes the hip and knee at the same time.

**Popliteus Muscle**

The popliteus muscle is located below the lateral gastrocnemius muscle, hidden deep inside the popliteal fossa.

**Origin:**

It originates at the lateral femoral condyle and the posterior horn of the lateral meniscus.
From here it runs between the fibular lateral ligament and the lateral meniscus diagonally to the opposite side to the posterior surface of the tibia. This is the reason why the lateral meniscus, unlike its medial counterpart, cannot coalesce with its collateral ligament.

**Insertion:**

Its point of insertion is at the **medial rear of the tibia**, above the **soleal line**.

Below the knee joint cavity on the lower leg, the flat triangular muscle belly develops.

**Nerve supply.**

- Arises from the tibial nerve with spinal roots L5-S2.

**Muscle Performance Test of the Popliteus Muscle**

The muscle performance test of the popliteus muscle can be done either in a sitting, prone or supine position. The patient lies on an examination table and has his knee and his ankle flexed at 90°. Stabilizing with one hand, the examiner holds the calcaneus from the back and outside. With the other hand, the examiner has a broad contact on the inner foot.

The examiner applies test pressure in the direction of the external rotation of the tibia over the lever of the foot. At this, it is not important if the examiner is able to rotate the foot, but that the tubercle of the tibia is held fix.

If the patient feels an instability or pain in the ankle area, then testing of the popliteal becomes problematic, if not impossible.

**Function and Innervation of the Popliteus Muscle**

The popliteus muscle is considered a weak medial rotator and flexor of the knee but plays an important role as the stabilizer of the **dorsal knee joint**.

The popliteus muscle has **2 essential functions:**

- **Contraction:** In a tightly expanded knee joint (e.g., in a supporting leg), it causes a contraction in order to prevent hyperextension or a snapping of the knee joint, and it thus supports the absorption of shock loads.
- **External rotation:** In a simultaneous reduction of the extensor tonus, it causes external rotation of the femur on the tibia.

For this reason, it is possible that the cruciate ligaments loosen and allow an introduced flexion of the knee joint. During the flexion, the popliteus muscle pulls the lateral meniscus dorsally to the tibia, thus preventing its entrapment; therefore, the lateral meniscus is not only passively more flexible than the medial, but it is also actively drawn dorsally in flexion.

The tibial nerve is responsible for the innervation of the popliteus muscle.

**Note:** An important task is the shock absorption of the knee joint and the posterior cruciate ligament.

**Tibialis Anterior Muscle**
Localization of the Tibialis Anterior Muscle

Image: “Tibialis Anterior 2” by Uwe Gille. License: Public Domain

The tibialis anterior muscle is the anterior shin muscle of our musculoskeletal system.

It originates in the lateral condyle of the tibia and the upper two-thirds of the lateral surface of the tibia. In addition, fibers arise from the interosseous membrane and the intermuscular septum.

The long spindle-shaped skeletal muscle runs under the superior and inferior extensor retinaculum on the medial side of the ankle to the foot and inserts on the plantar surface of the medial cuneiform and the base of the 1st metatarsal.

Muscle Performance Test of the Tibialis Anterior Muscle

The patient lies on the examination table looking at the examiner. The examiner flexes the knee at 90° and the forefoot is placed in the maximum supination position with plantar flexion of the big toe.

The peroneus muscles are excluded from the test as much as possible by bringing them into supination position.

On the back of the foot, the examiner makes contact with the test hand directly distal to the talus and the stabilizing hand is on the calcaneus. The patient pushes against the resistance of the examiner in the direction of the extension. The patient should keep his toes loose during the test so that the extensor digitorum longus muscle and the extensor hallucis muscle do not participate.

Note: Care should be taken to ensure that there will be no punctual bone contact over the metatarsal bones in order to prevent pain-related diminution. Moreover, a contraction inhibition exists in shortened calf musculature. The strength test should be performed in the knee joint with the flexed leg.
Function and Innervation of the Tibialis Anterior Muscle

An extension in the ankle joints is caused by the tibialis muscle and can lift the medial foot border. The muscle is particularly active during walking when the foot is lifted off the ground and later the heel is put back on the ground. Together with the antagonistic soleus, the tibialis anterior balances the lower leg on the talar dome while standing.

The innervation is provided by the deep peroneal nerve.

**Note:** The tibialis anterior muscle is the most important dorsal flexor but only a weak supinator and adductor of the foot in the Chopart’s joint. **Special characteristic:** Together with the peroneus longus muscle, the tibialis anterior muscle forms an antagonistic muscle sling, the so-called “stirrup.”

Review Questions

The correct answers can be found below the references.

1. **What is the name of the muscle that consists of pars clavicular, pars acromialis, and pars spinalis?**
   
   A. Pectoralis major muscle  
   B. Infraspinatus muscle  
   C. Sartorius muscle  
   D. Deltoid muscle  
   E. Popliteus muscle

2. **Which match is wrong?**
   
   A. Deltoid muscle = hugging muscle  
   B. Pectoralis major = strongest abductor  
   C. Iliopsoas muscle = most important hip flexor  
   D. Sartorius muscle = most important dorsal flexor  
   E. Tibialis anterior muscle = the only muscle that flexes the hip and knee at the same time

3. **Which muscle testing is problematic or even impossible if the patient feels an instability or pain in the ankle area?**
   
   A. Tibialis anterior muscle  
   B. Popliteus muscle  
   C. Tibialis posterior muscle  
   D. Iliopsoas muscle  
   E. Sartorius muscle

References


Correct answers: 1D, 2C, 3B

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