

#### Grades 0, 1 & 2

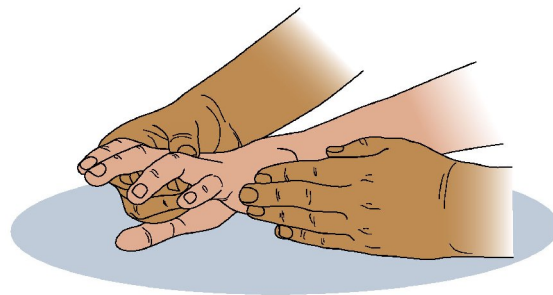
**Patient Position:** The shoulder is in neutral rotation, neutral flexion/extension, and adducted. The elbow is in full extension. The forearm is in full pronation and the wrist in neutral flexion-extension. The MCP joint is stabilized.

An alternate position is with the shoulder in internal rotation, adducted, and neutral flexion/extension. The elbow is in 90° of flexion, the forearm and wrist are in neutral flexion /extension, and the MCP joint is stabilized.

**Examiner Position:** Stabilize the dorsal wrist and hand by pressing down lightly on the back of the hand. Be sure that the MCP joints are stabilized to prevent hyperextension. Palpate the abductor digiti minimi muscle and observe the muscle belly for movement.

**Instructions to Patient:** “Move your little finger away from your ring finger.”

**Action:** The patient attempts to abduct the little finger through the full range of motion.



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#### T1 Common Muscle Substitution

Finger extension can mimic 5th finger abduction. Proper positioning and stabilization will minimize this error.

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## L2 Hip Flexors | Iliopsoas

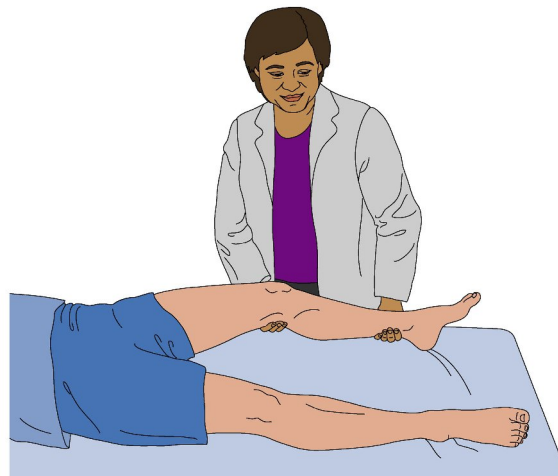
#### Grade 3

**Patient Position:** The hip is in neutral rotation, neutral adduction/abduction, with both the hip and knee in 15° of flexion.

**Examiner Position:** Support the dorsal aspect of the distal thigh and leg. Do not allow flexion beyond 90° when examining acute thoraco-lumbar injuries due to the kyphotic stress placed on the lumbar spine.

**Instructions to Patient:** “Lift your knee towards your chest as far as you can, trying not to drag your foot on the exam table.”

**Action:** The patient attempts to flex hip to 90° of flexion.



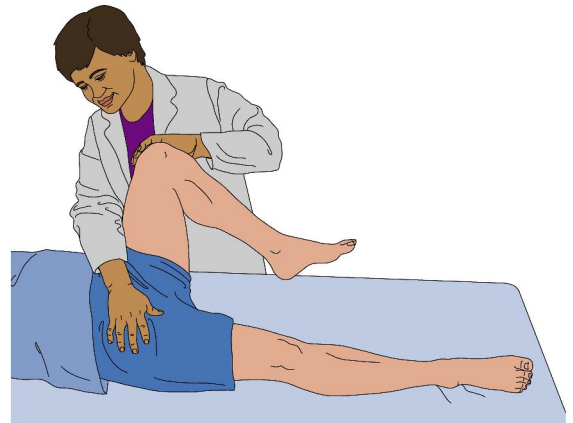
**Grades 4 & 5**

**Patient Position:** The hip is in 90° of flexion with the knee relaxed.

**Examiner Position:** Brace the anterior superior iliac spine on the opposite side and place a hand on the distal anterior thigh, just above the knee. Pressure is applied in the direction of hip extension

**Instructions to patient:** “Hold your knee in this position. Don’t let me push it down.”

**Action:** The patient attempts to resist the examiner’s push and keep the hip flexed at 90°.



**Grade 2**

**Patient Position:** Place the patient in the gravity eliminated position with the hip in external rotation and 45° of flexion. The knee is flexed at 90°.

**Examiner Position:** Support the leg.

**Instructions to Patient:** “Try to bring your knee out to the side,” or “Try to flex your thigh toward the side of the body.”

**Action:** The patient attempts to move through the full range of motion in hip flexion.



#### Grades 0 & 1

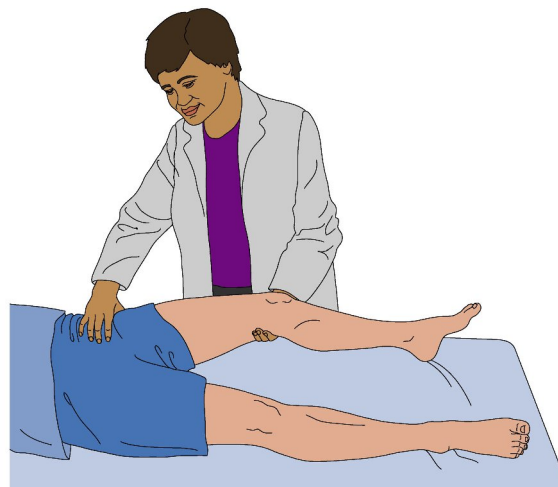
**Patient Position:** Place the patient in the grade 3 position, with the hip in neutral rotation, neutral adduction/abduction and the hip and knee flexed to 15°.

**Examiner Position:** Support the thigh to eliminate friction while palpating the superficial hip flexors just distal to the anterior superior iliac spine.

**Instructions to Patient:** Ask the patient to “lift your knee towards your chest as far as you can.”

**Action:** The patient attempts to flex the hip.

**Note:** For Grade 1, the examiner is actually palpating the more superficial hip flexors, i.e. sartorius and rectus femoris rather than the iliopsoas. The insertion of the iliopsoas is too deep to be seen or felt when it possesses only Grade 1 strength. When examining a patient with an acute traumatic lesion below T8, the hip should not be allowed to flex passively or actively beyond 90°. Flexion beyond 90° may place too great a kyphotic stress on the lumbar spine.



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#### L2 Common Muscle Substitution

Any muscle of the trunk that can elevate or rotate the pelvis can trick the examiner into thinking that the hip flexor muscles are active. This could include the rectus abdominus, the adductor muscles, obliques, or the quadratus lumborum. With accurate palpation, correct patient instructions, and observation of any trunk movement, this substitution can be avoided.

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### L3 Knee Extensors | Quadriceps

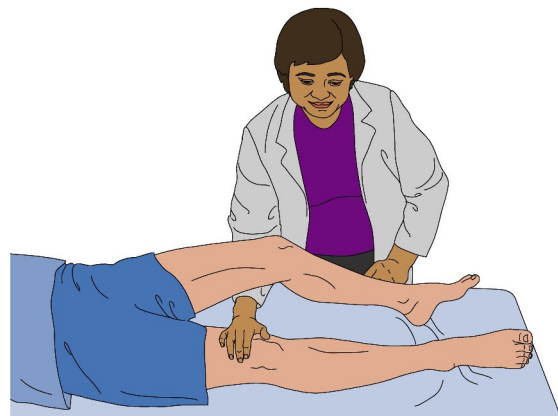
#### Grade 3

**Patient Position:** The hip is in neutral rotation, neutral adduction/abduction and 15° of flexion. The knee is in 30° of flexion.

**Examiner Position:** Place the arm under the tested knee and rest the hand on the patient's distal thigh. This causes the tested knee to flex to approximately 30°.

**Instructions to Patient:** “Straighten your knee.”

**Action:** The patient attempts to straighten the knee through the full range of motion in extension.



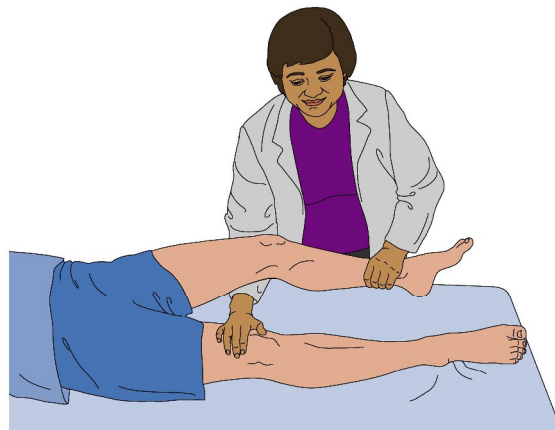
### **Grades 4 & 5**

**Patient position:** Same as grade 3, except the knee is in 15° of flexion.

**Examiner Position:** Place the arm under the tested knee and rest the hand on the patient's opposite thigh. Grasp the leg to be tested, just proximal to the ankle.

**Instructions to Patient:** "Hold this position. Don't let me bend your knee."

**Action:** Examiner exerts downward force into knee flexion while the patient attempts to hold the knee in 15 degrees of flexion.



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### **Grade 2**

**Patient Position:** The hip is in external rotation and 45° of flexion. The knee is flexed at 90°.

**Examiner position:** Support the distal thigh and leg.

**Instructions to Patient:** "Straighten your knee."

**Action:** The patient attempts to move through the full range of motion.



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### **Grades 0 & 1**

**Patient Position:** Place the patient with the hip in neutral rotation, neutral adduction/abduction with both the hip and knee in 15° of flexion.

**Examiner Position:** Support the leg. Palpate the patellar tendon or the belly of the quadriceps muscle for trace function. The muscle belly may also be observed for movement.

**Instructions to Patient:** "Straighten your knee."

**Note:** In this position, asking the patient to push the back of the knee downward toward the exam table may be better to elicit trace contraction in the quadriceps.

**Action:** The patient attempts to straighten the knee.

