RESUMEN EXPLORACION DE LA EXTREMIDAD INFERIOR

ANTES DE EMPEZAR

Como todo es **bilateral** procurar hacer la mayoría de cosas de forma **simultanea**
El enfermo siempre en la **posición correcta**.
Seguir siempre el **mismo orden** en la palpación para no saltarse nada
Es mejor hacerla **por zonas** y terminar con la exploración neurológica y vascular de toda la extremidad

1-. CADERA

A) INSPECCION

1. Fijarse en el aspecto de la pelvis y caderas, alineación de las extremidades
2. Fijarse en la posición de la extremidad y de las articulaciones en reposo y la actitud del paciente
3. Fijarse en el aspecto de los músculos atrofias o hipertrofias
4. Buscar **lesiones superficiales:** bultos, lesiones dérmicas, cambios color, etc.

B) PALPACION ARTICULACIONES-HUESOS-TENDONES-MUSCULOS

5. Compresión antero-posterior y lateral del **anillo pelviano**
6. Palpación de la **sínfisis del pubis**
7. Palpación de la **bolsa ileopectinea** (lateral al pulso femoral)
8. Palpación de la bolsa **trocantérica** (sobre el trocánter mayor)
9. Palpación de la bolsa isquioglutea (sobre la **tuberosidad isquiática**)
10. Palpación de la zona entre el trocanter y la tuberosidad isquiática (ciático)

C) MOVIMIENTOS PRIMERO ACTIVA LUEGO CONTRARESISTENCIA

11. Valorar la **flexión (sobre el abdomen) y la extensión**
12. Valorar la **abducción y aducción** con la pierna recta
13. Valorar la **rotación interna y externa** con la pierna recta

D) PRUEBAS ESPECIALES

14. Medir la **longitud** de las piernas (desde espina iliaca anterosuperior hasta maleolo interno
15. Maniobra de **Ortolani** (niños): abducción y rotación externa bilateral con el muslo flexionado
16. **Compresión del trayecto del ciático** en muslo y pierna
17. Elevación de pierna recta extendida hasta que ocurra dolor (Lasegue)
18. **Ingle** (estudio aparte)

2-. RODILLA

A) INSPECCION ANTERIOR Y POSTERIOR

1. Fijarse en el aspecto de las rodillas, rotula y de la tuberosidad tibial
2. Fijarse en la posición genu varo o genu valgo
3. Fijarse en la actividad, posición de la articulación y aspecto de los músculos
4. Buscar **lesiones superficiales:** bultos, lesiones dérmicas, cambios color, etc.

B) PALPACION ARTICULACIONES-HUESOS-TENDONES-MUSCULOS

5. Palpar la **rotula superficie**, laterales y tendón rotuliano
6. Palpar **la zona suprarotuliana e infrarotuliana**
7. Palpar la **zona lateral** (meniscos y ligamentos) con la pierna cruzada
8. Localizar y palpar la **interlinea articular**
9. Palpar el **hueco poplíteo**
10. **Presionar la rotula contra el fémur**, comprobar si hay peloteo; desplazarla en sentido distal
11. Palpar los **músculos** flexores, extensores y aductores del muslo

C) MOVIMIENTOS PRIMERO ACTIVA LUEGO CONTRARESISTENCIA

12. **Flexión y extensión** de la rodilla
13. Rotación interna y externa (con la rodilla a 90º de flexión)
14. **Flexión y extensión de la muñeca**

D) PRUEBAS ESPECIALES

15. Valorar los Ligamentos Laterales: **forzar el varo y valgo** con la rodilla en ligera flexión empujarla con una mano y el tobillo (en dirección contraria)
16. Valorar los **ligamentos cruzados**: con la rodilla flexionada y las manos agarrando toda la pierna, los pulgares apoyados en la línea media tirar hacia delante y después hacia detrás, para comprobar la integridad de los ligamentos
17. Valorar los **meniscos McMurray**: rodilla en flexión y rotación externa máxima, se va extendiendo la pierna despacio al tiempo que se palpa la interlinea articular (buscar chasquido, no dolor), luego lo mismo en rotación interna

3-. TOBILLO-PIE

A) INSPECCION **ANTERIOR Y POSTERIOR**

1. Aspecto del tobillo y **maleolos**
2. Aspecto de la **bóveda** plantar y dedos.
3. Revisión cuidadosa **planta del pie** y espacios **interdigitales**
4. Buscar **lesiones superficiales:** bultos, lesiones dérmicas, cambios color, etc.

B) PALPACION **ARTICULACIONES-HUESOS-TENDONES-MUSCULOS**

5. Palpar la **articulación** del tobillo
6. Palpar la **articulación** calcáneo-astragalina
7. Palpar las **articulaciones metatarsofalangicas e interfalángicas**, comprimiéndolas entre pulgar e índice
8. Palpar los **maleolos** interno y externo
9. Palpar el **calcáneo**
10. Palpar apófisis **estilóides** y la cuña
11. Palpar los **metatarsianos** y las falanges
12. Palpar los **ligamentos laterales** en reposo y forzando la inversión y eversión
13. Palpar el tendón de **Aquiles**
14. Palpar la **superficie plantar**

C) MOVIMIENTOS **PRIMERO ACTIVA LUEGO CONTRARESISTENCIA**

15. **Flexión dorsal y plantar del pie** (hacerlo con el pie **colgando** y no tumbado) **MUY IMPORTANTE**
16. **Inversión y eversión** del pie
17. **Flexión y extensión del dedo gordo**
18. Flexión de las articulaciones metatarsofalangicas

D) PRUEBAS ESPECIALES

19. **Cajón anterior y posterior del tobillo**
20. Comprobación del **valgo y varo forzado** en tobillo

4-. NEUROLOGICO

21. El **Tono muscular** se ha valorado al palpar los músculos
22. La **movilidad** muscular ya se ha valorado
23. **Reflejo Rotuliano** (L2-L4)
24. Reflejo **Aquileo** (S1)
25. Reflejo **Plantar** (L5-S1)
26. Reflejo Cremastérico
27. Sensibilidad **Superficial** en cara interna-posterior y externa
28. Sensibilidad **Dolorosa** en cara interna-posterior y externa
29. Sensibilidad **Propioceptiva** (posición del dedo gordo y dirección del movimiento)

5-. VASCULAR

30. Siempre valorar **pulso femoral y tibial** posterior.
30. Siempre valorar la presencia de **edema**
30. Siempre valorar la **insuficiencia valvular**
31. Ante la mínima anomalía hacerlo completo incluyendo las maniobras especiales vasculares

5 Low Back, Hip, and Shooting Leg Pain

First Thoughts, Basic (and a Little Not-So-Basic) Pathophysiology

Because the underlying pathologies of low back, hip, and shooting leg pain (radicular pain) reside within the low back and/or hip, essentially the same physical examination is performed for each complaint. Therefore, all three complaints are discussed in this chapter. As in the cervical spine, because the diagnostic and therapeutic approach to radicular and nociceptive pain is very different, it is important to distinguish them during the history and physical examination. Understanding the language of low back pain is as important as understanding the language of neck pain. You may wish to briefly review the principles and terminologies discussed at the beginning of Chapter 1.

In the lumbosacral spine, radicular symptoms are caused by an intervertebral disc bulge, protrusion, extrusion, or sequestration that compresses and inflames a nerve root in approximately 98% of all cases. Other causes of radicular symptoms emanating from the lumbosacral spine include disc osteophytes, a buckled ligamentum flavum, zygapophysial (Z)-joint hypertrophy, and other causes of lumbosacral spinal stenosis.

Axial low back pain is defined as "pain perceived within a region bounded superiorly by a transverse line through the T12 spinous process, laterally by the lateral borders of erector spinae muscles and posterior superior iliac spinous processes, and inferiorly by a transverse line through sacrococcygial joints." In the low back, referral pain patterns commonly present in the hip or leg. A classic example of a referral pain pattern in the lumbosacral spine is low back pain associated with aching buttock pain. The lumbosacral region and buttocks are both innervated by L4–S1. However, the buttock is innervated by the ventral rami of

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By: G. Cooper © Humana Press Inc., Totowa, NJ

these nerve roots (the superior and inferior gluteal nerves), and the lumbosacral region is innervated by the dorsal rami. The brain is sometimes unable to distinguish whether axial low back pain is actually originating from the buttocks or low back (because both fibers use the L4–S1 nerve roots). Low back pain is therefore sometimes perceived in a poorly defined distribution in *both* the low back and buttocks.

Acute low back pain lasts less than 3 months. Numerous potential causes of low back pain, including more vague diagnoses, such as "muscle strain," "muscle tightness," and "myofascial pain," have been reported. Evidence to support these assertions is often limited and anecdotal. Conventional wisdom has been that 90% of cases of acute low back pain spontaneously resolve. The true story is somewhat more complicated. In fact, systematic evaluation of the data has revealed that anywhere from 40 to 90% of acute low back pain may initially resolve prior to 3 months. A more common picture of low back pain may be one of periodic remissions and relapses.

However, when low back pain becomes chronic (lasting more than 3 months), the evidence regarding its etiology and pathophysiology is much more scientific and complete. In fact, research has shown that there are three common causes of chronic low back pain. Each of these causes has been scientifically validated and each is readily identified when the proper diagnostic investigations are rigorously pursued.

Chronic low back pain has been shown to be caused by a painful intervertebral disc (discogenic low back pain) in approximately 39% of cases, a diseased Z-joint in up to 30% of cases, and sacroiliac joint disease in approximately 15% of cases.

History

Ask the patient the following questions:

1. Where is your pain?

This question will help you distinguish nociceptive pain from radicular pain (hip pain and axial low back pain are both nociceptive pain and must ultimately be distinguished during the physical examination). Hip pain is often perceived in the hip and/or groin, although it may also be perceived in the knee. Common causes of hip pain include dislocation, fracture, and osteoarthritis. Axial low back pain with a referral pain pattern may also occur in the hip. It is more common, however, for axial low back pain with referral pain to occur in the buttocks and/or leg(s) in a pattern that is difficult to

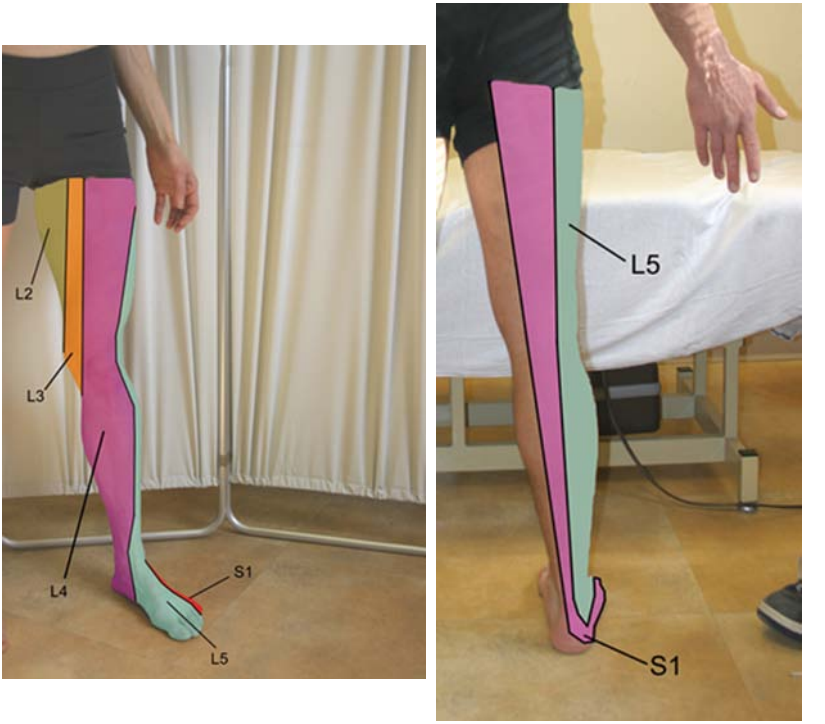

Photo 1. Lower extremity dermatome patterns. (A) Anterior, (B) posterior.

localize. Radicular pain, by contrast, is band-like and more easily localized as it radiates down the leg. Radicular symptoms over the anterior thigh that end at the knee are typically associated with the L3 nerve root. Radicular symptoms that extend over the medial knee, medial calf, and medial malleolus are typically associated with the L4 nerve root. Radicular symptoms that occur over the dorsum of the foot are typically associated with L5. Radicular symptoms that occur along the back of the thigh and the lateral heel are typically associated with S1. It is rare to have radicular symptoms from S2 or below. Photo 1 demonstrates the characteristic dermatomes of the lower extremity (Photo 1). Although knowing the location and distribution of pain is helpful, further questioning is necessary to determine if the pain is truly radicular, axial low back (with or without a referral pattern), or hip pain.

2. **What is the quality of your pain (e.g., shooting, electric, dull, aching, etc.)?**

   This is the question that will definitively tell you if the patient has radicular pain or axial pain. Radicular pain is sharp, shooting, and electric. Nociceptive pain (axial low back and hip pain) and referred pain are *not* sharp, shooting, or electric. This is an easy, and very important, distinction to make.

3. **How long have you had pain?**

   This is a particularly important question for low back pain. Acute low back pain is defined as low back pain lasting less than 3 months and is much more likely to spontaneously resolve than chronic low back pain. Therefore, aggressive diagnosis and treatment of acute low back pain may not be necessary.

4. **Do any positions aggravate or relieve your symptoms?**

   Patients with radicular symptoms caused by spinal stenosis will classically complain of pain aggravated by leaning backward. These patients also have improved symptoms with trunk flexion. This is often referred to as the "shopping cart sign." In this sign, the patient reports improvement of symptoms while shopping because the patient leans forward while pushing the shopping cart. By contrast, patients with a disc herniation causing radicular symptoms will report *increased* symptoms with trunk flexion. This is because trunk flexion increases the intradiscal pressure.

5. **Have you tried anything to help your pain?**

   This question is most useful for when you are deciding which diagnostic studies to order, if any, and for selecting treatment options.

6. **Have you experienced any recent night sweats, weight loss, hematuria, urinary retention, frequency, hesitancy, or cough? Do you have a history of cancer, overseas travel, recent surgery, fever, or increased pain at rest? Has your pain ever woken you from sleep?**

   These questions should be asked of every patient with low back, hip, or radicular symptoms in order to help screen more serious underlying conditions such as a tumor or infection.

7. **Have you had any recent change in bowel or bladder habits? Do you have any altered sensation in your groin, buttocks, or inner thighs?**

   These questions should be asked of every patient with suspected spinal pathology to help rule out cord impingement, conus medullaris, and cauda equina syndrome.

Physical Exam

Having completed the history portion of your examination, you have distinguished whether or not your patient has nociceptive pain (remember that low back and hip pain must be distinguished during the physical examination) or radicular pain. You have also begun to narrow your differential diagnosis. It is now time to perform your physical exam.

Begin by observing the patient's gait. Is the gait antalgic (i.e., does the patient limp or favor one leg over the other)? Instruct the patient to stand on one foot and then the other. This is the Trendelenberg test, and it is performed to examine the integrity of the gluteus medius muscle. If one gluteus medius muscle is weak, when the patient stands on the weak side, the patient's pelvis will shift upwards to the ipsilateral side of weakness and the patient's trunk will lurch to the contralateral side in order to maintain the patient's center of gravity (Photo 2).

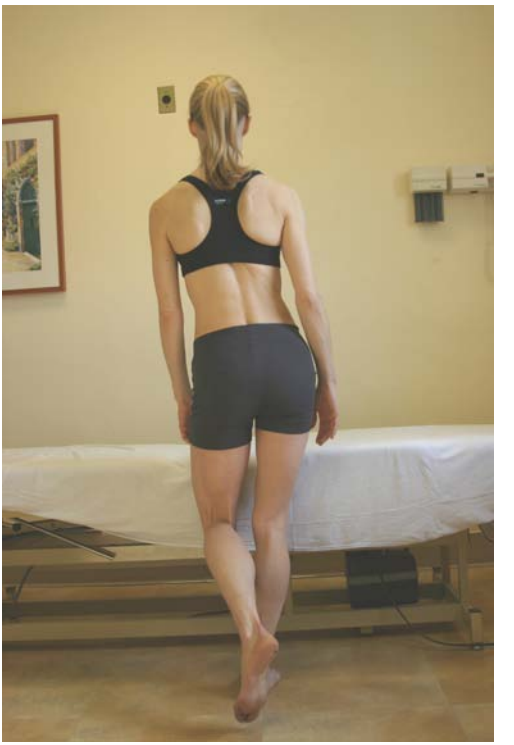

Photo 2. Stimulated positive Trendelenberg sign.

Standing behind the patient, observe for any apparent leg length discrepancy (the true leg length may be measured from the anterior superior iliac spine to the medial malleolus; however, using a tape measure is not generally necessary unless leg length discrepancy is suspected on general observation).

Palpate the vertebral bodies. Tenderness over the vertebral bodies should prompt further investigation for a vertebral metastasis or compression fracture. Palpate the paraspinal muscles for any muscle spasms, tender points, or trigger points (**Note:** trigger points are defined as discrete areas of tenderness that also have a referral pain pattern when palpated; tender points are tender but have *no* referral pain pattern). Palpate the soft tissues over the posterior portion of the greater trochanter (Photo 3). Tenderness in this region may indicate trochanteric bursitis.

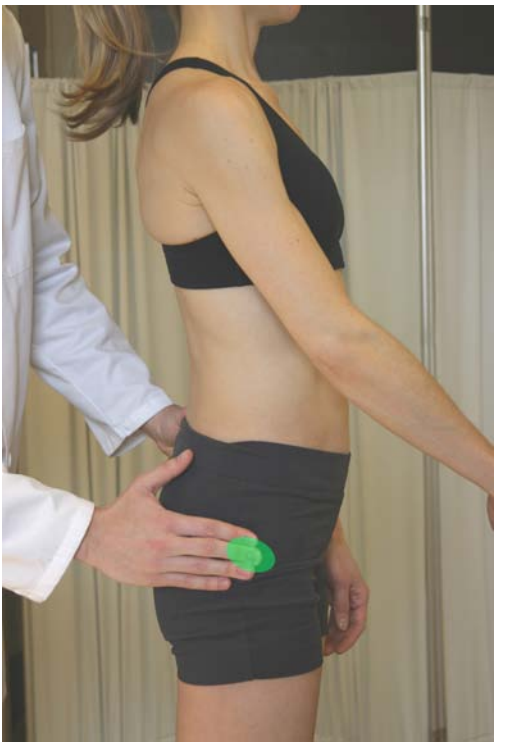

Photo 3. Greater trochanter bursa palpation.

Photo 4. Gillet's test.

Remain standing behind the patient and place one thumb on the posterior superior iliac spine and the other thumb on the patient's sacrum. Instruct the patient to stand on one leg and have the patient pull the opposite leg to the chest (Photo 4). This is Gillet's test, and it is used to test for sacroiliac joint involvement. In a patient with a normal sacroiliac joint, the ipsilateral posterior superior iliac spine should move inferiorly. If the posterior superior iliac spine is felt to move superiorly, then the joint is described as hypomobile, and may be contributing to the patient's pain. Repeat the test in the opposite leg.

Next, instruct the patient to bend over as far as the patient can comfortably go. Observe the patient's spine for any asymmetry or scoliosis. Trunk flexion increases intradiscal pressures. If bending over reproduces shooting leg pain or other radicular symptoms (e.g., numbness or tingling), the patient may have a herniated disc.

Next, instruct the patient to lean backwards as far as is comfortable. Then, obliquely extend the patient's spine first to the right, and then to the left (Photo 5). This maneuver stresses the posterior elements of the spine. If extension or oblique extension reproduces the patient's low back pain, the patient may have Z-joint pain. If extension or oblique extension reproduces shooting leg pain or other radicular symptoms, the patient may have foraminal stenosis.

Photo 5. Passive obique extension.

Ask the patient to stand on one leg and extend backward toward the supporting leg (Photo 6). Repeat the test with the patient standing on the other leg. This is the Stork Standing test, and if pain is reproduced with the test, the patient may have a pars interarticularis stress fracture (spondylolisthesis). If the stress fracture is unilateral, standing on the ipsilateral leg and bending backwards toward that leg will be most painful.

Next, have the patient sit down. Instruct the patient to lean forward and touch the chin to the chest. Then, slowly extend the leg (Photo 7). This is a dural tension test. If this reproduces radicular symptoms radiating down the patient's leg, the patient may have nerve root compression and/or inflammation.

With the patient still seated, internally and externally rotate the patient's hip using the ankle as a lever (Photos 8 and 9). If this maneuver

Photo 6. Stork test.

Photo 7. Seated dural tension sign.

Photo 8. Hip internal rotation.

Photo 9. Hip external rotation.

reproduces the patient's pain, the patient's hip (or even back) pain may be originating from the hip. If this does not reproduce the patient's pain, the patient probably does not have hip pathology causing the pain.

Next, have the patient flex the hip against resistance (Photo 10). This tests the patient's iliopsoas muscle, which is innervated by the femoral nerve (L1–L3).

Have the patient extend the knee against resistance (Photo 11). This tests the patient's quadriceps, which are innervated by the femoral nerve (L2–L4).

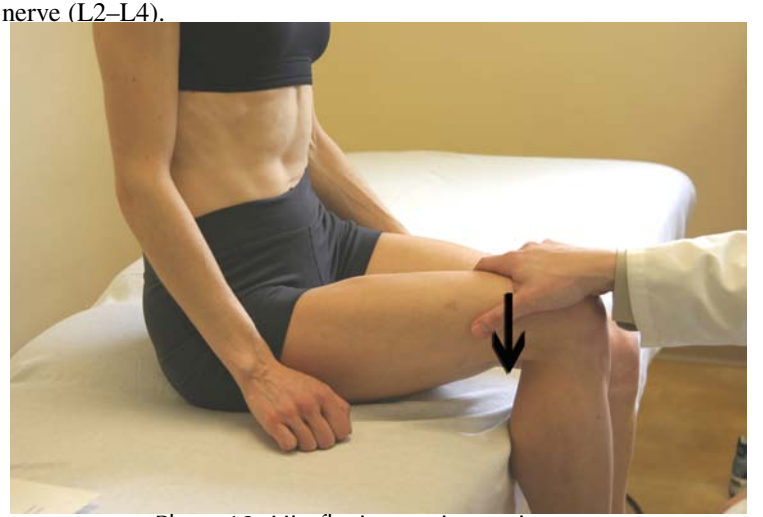

Photo 10. Hip flexion against resistance.

Photo 11. Knee extension against resistance.

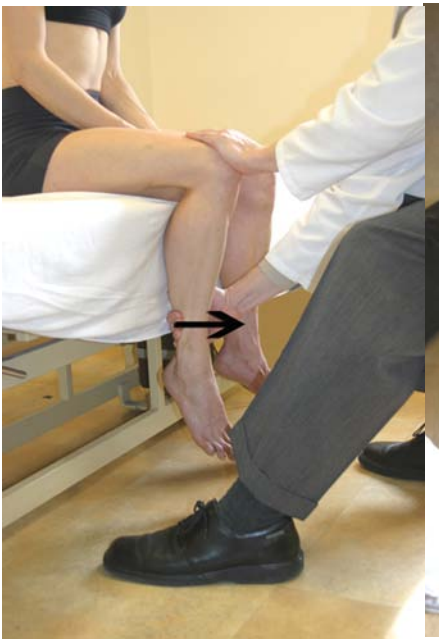

Photo 12. Knee flexion against resistance.

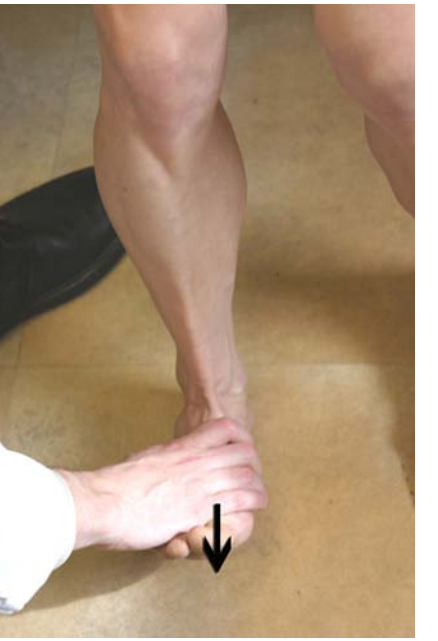

Photo 13. Ankle dorsiflexion against resistance.

Next, have the patient flex the knee against resistance (Photo 12). This tests the patient's hamstrings, which are innervated primarily by the tibial portion of the sciatic nerve (L5, S1; the short head of the biceps femoris is innervated by the common peroneal division of the sciatic nerve, L5–S2).

With the patient's heel planted on the ground, instruct them to dorsiflex the ankle against resistance (Photo 13). This tests the patient's tibialis anterior, which is innervated by the deep peroneal nerve (L4, L5).

Next, have the patient plantarflex against resistance (Photo 14). This tests the patient's gastrocnemius and soleus muscles, which are innervated by the tibial nerve (S1).

Have the patient extend the big toe against resistance (Photo 15). This is an important test because the big toe (hallucis longus) is

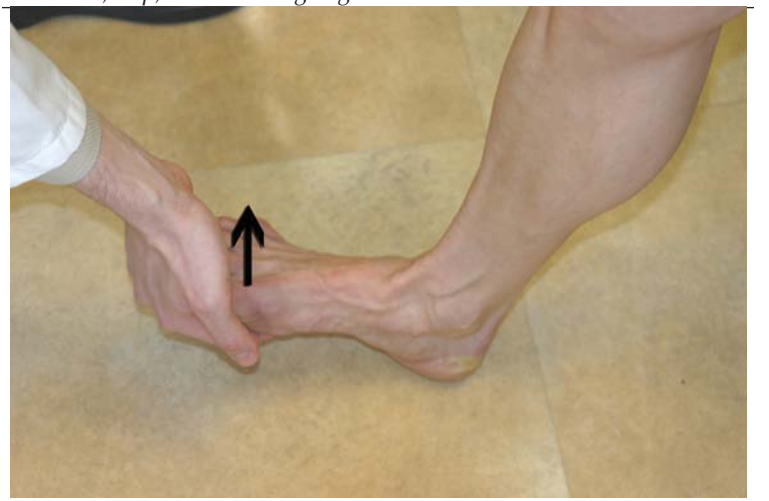

Photo 14. Ankle plantar flexion against resistance.

Photo 15. Big toe extension against resistance.

extended by the extensor hallucis longus, which is innervated almost exclusively by the L5 nerve root. In a patient with a suspected radiculopathy, extensor hallucis longus weakness is a specific clinical indicator for involvement of the L5 nerve root.

With the patient still seated, it is convenient to test the reflexes. Test the patella reflex (L4) and the Achilles reflex (S1) (Photos 16 and 17). Test for an upper motor neuron deficit by evaluating for a Babinski reflex. To evaluate for this reflex, the examiner runs a sharp instrument along the plantar surface of the foot, starting at the calcaneus and moving along the lateral border and then curving around to the big toe (Photo 18). The patient has a Babinski reflex if the patient extends the big toe and flexes the rest of the toes. If the patient flexes the big toe or if there is no reaction, then there is no Babisnki reflex. In patients without an upper motor neuron lesion, the Babinski reflex disappears around the first year of life. The presence of a Babinski reflex therefore indicates an upper motor neuron lesion.

It is now appropriate to perform a quick test of sensation (Photo 19). The L3 dermatome is tested over the medial femoral condyle; the L4 dermatome is tested over the medial malleolus; the L5 dermatome is tested over the dorsal aspect of the third or fifth digit; and the S1 der-

Photo 16. Patellar reflex.

Photo 17. Achilles reflex.

Photo 18. Babinski reflex elicitation.

matome is tested over the lateral aspect of the heel. Compare both sides of the body for symmetry and note any numbness or dysethesias.

Finally, with the patient still seated, check for pulses behind the knees in the popliteal arteries bilaterally and the posterior tibial arteries behind the medial malleolus bilaterally.

Now have the patient lie in the supine position. Instruct the patient to adduct the hips against resistance (Photo 20). This tests the patient's adductor longus muscle, which is innervated by the obturator nerve (L2–L4).

The Hoover test is helpful in identifying potential malingering patients. With the patient supine, cup your hands underneath both of the patient's heels. Instruct the patient to lift one heel off the table. When the patient is truly attempting to lift the leg off the table, he or she will automatically put downward pressure on the opposite heel (which you will feel in your palm). If the patient states that pain prevents them from

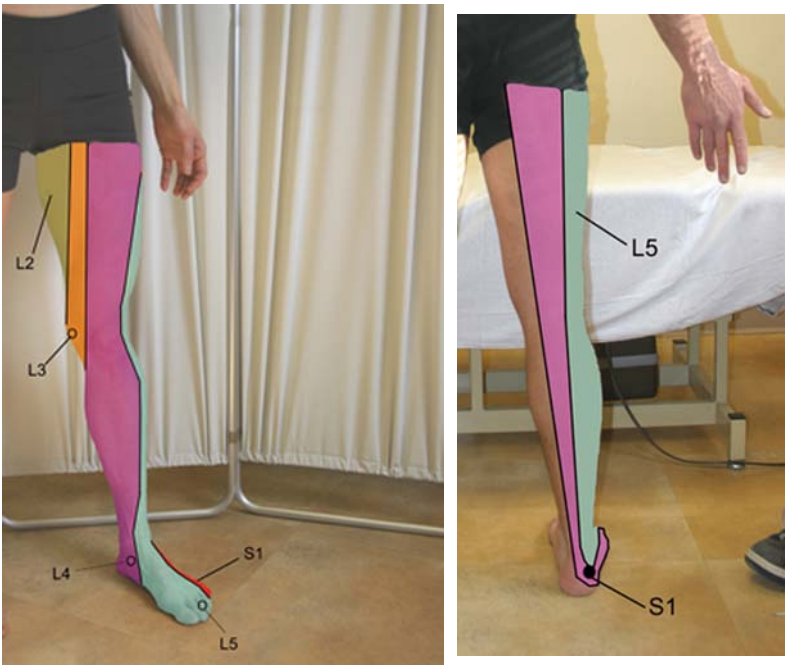

Photo 19. Lower extremity dermatomes with dots indicate where to test for sensation. (A) Anterior, (B) posterior.

raising the leg, but you do not feel downward pressure in the contralateral palm, the patient is probably not really attempting to raise the leg.

Next, take the patient's extended leg and slowly raise it (flexing the patient's hip; Photo 21). This is the straight leg-raise test. If this maneuver reproduces the patient's radicular symptoms shooting down the leg, the patient may have a pathological process (most commonly a disc protrusion) compressing and inflaming the nerve root. Typically, the maneuver reproduces radicular symptoms at 35–70° of hip flexion. It is at this amount of flexion that the nerves are maximally stretched. If the patient complains of pain but is unclear if the pain is radicular in nature, dorsiflex the ankle. If ankle dorsiflexion does not increase the symptoms, then the symptoms are more likely to be the result of hamstring tightness. If radicular symptoms are "reproduced" after 70° of flexion, the result is more likely to be a false positive.

Photo 20. Hip adduction against resistance.

Photo 21. Straight leg raise.

Now take hold of the patient's knee and ankle, and with the hip and knee flexed to approximately 90°, move the hip into internal and then external rotation. This is a convenient and effective way to test for hip pathology again. If this maneuver reproduces the patient's pain, the hip may be the underlying cause of the symptoms. If this fails to reproduce the patient's pain, the hip is unlikely to be involved.

With the patient still lying in the supine position, perform the Thomas test to assess for tight hip flexors. To perform the Thomas test, have the patient lie in the supine position and flex one hip so that the patient is hugging one knee to the chest. If the patient has a tight hip

Photo 22. Stimulated positive Thomas test.

Photo 23. Negative Thomas test.

flexor, the extended leg (the leg being tested) will lift off the table (Photo 22). If the patient does not have a tight hip flexor, the extended leg will remain flat on the table when the patient hugs the other knee to the chest (Photo 23).

Next, test for a sacroiliac joint or hip injury by performing the Faber test. Faber is an acronym for flexion, abduction, and external rotation. To perform this test (the patient should be supine), place the foot of the involved side onto the opposite knee in a "figure-4" position (thus flexing, abducting, and externally rotating the affected hip. If this produces pain in the inguinal region, the hip joint may be involved. Further stress the sacroiliac joint by pushing down on the flexed knee, as well as on the contralateral superior iliac spine. If this maneuver produces pain, the sacroiliac joint may be involved.

Next, have the patient lie on his or her side. Instruct the patient to abduct the hip against resistance (Photo 24). This tests the patient's gluteus medius, which is innervated by the superior gluteal nerve (primarily L5).

Next, with the patient still lying on his or her side, test for a tight iliotibial band by performing Ober's test. In this test, flex the patient's hip and knee that are lying on the table (this is done for stability). Then, take the patient's other leg (the one not in contact with the table) and

Photo 24. Hip abduction against resistance.

Photo 25. Negative Ober test.

Photo 26. Stimulated positive Ober test.

Photo 27. Hip extension against resistance.

passively abduct and extend the hip with the knee flexed to 90°. Next, slowly allow the upper leg to fall to the table. If the iliotibial band is not tight, the leg will fall to the table (Photo 25). If the iliotibial band is tight, the upper leg will not fall to the table but instead, will remain in the air (Photo 26). This test also places stress on the femoral nerve, and if it invokes paresthesias in the leg, femoral nerve pathology should be considered. If the test is performed with the knee extended, less stress is placed on the femoral nerve. Have the patient roll onto the other side and repeat testing of the hip abductor and Ober's test.

Have the patient lie in the prone position and instruct the patient to extend the hip against resistance (Photo 27). This tests the gluteus maximus, which is innervated by the inferior gluteal nerve (S1).

Table 1 lists the major movements of the hip and leg, along with the involved muscles and their innervation.

Next, test for a tight rectus femoris by performing Ely's test. In this test, passively flex your patient's knee (Photo 28). If the patient's ipsilateral hip spontaneously flexes, this is an indication that the rectus femoris is tight (Photo 29).

With your patient still in the prone position, passively extend the hip and flex the knee. If this maneuver reproduces shooting leg pain, there may be a radiculopathy involving L2–L4.

Table 1
Primary Muscles and Innervation for Hip, Knee, Ankle, and Big Toe Movement

Major muscle movement	*Primary muscle(s) involved*	*Primary innervation*
Hip flexion	Iliopsoas.	Femoral nerve (primarily L3).
Hip extension	Gluteus maximus.	Inferior gluteal nerve (primarily S1).
Hip adduction	Adductor longus.	Obturator nerve (L2–L4).
Hip abduction	Gluteus medius and gluteus minimus.	Superior gluteal nerve (primarily L5).
Knee flexion	Hamstrings (semimembranosus, semitendinosus, biceps femoris).	Primarily tibial but also peroneal portion of sciatic nerve (primarily L5).
Knee extension	Quadriceps (vastus lateralis, vastus medialis, vastus intermedius, rectus femoris).	Femoral nerve (primarily L4).
Ankle dorsiflexion	Tibialis anterior.	Deep peroneal nerve (primarily L4).
Ankle plantarflexion	Gastrocnemius, soleus.	Tibial nerve (primarily S1).
Big toe extension	Extensor hallucis longus.	Deep peroneal nerve (primarily L5).

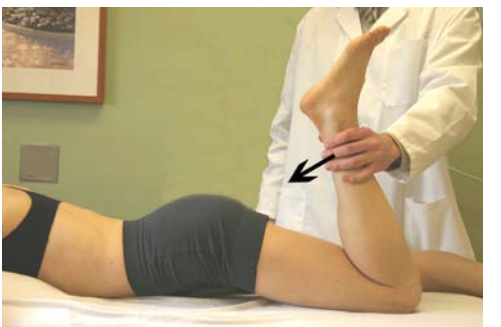

Photo 28. Negative Ely's test.

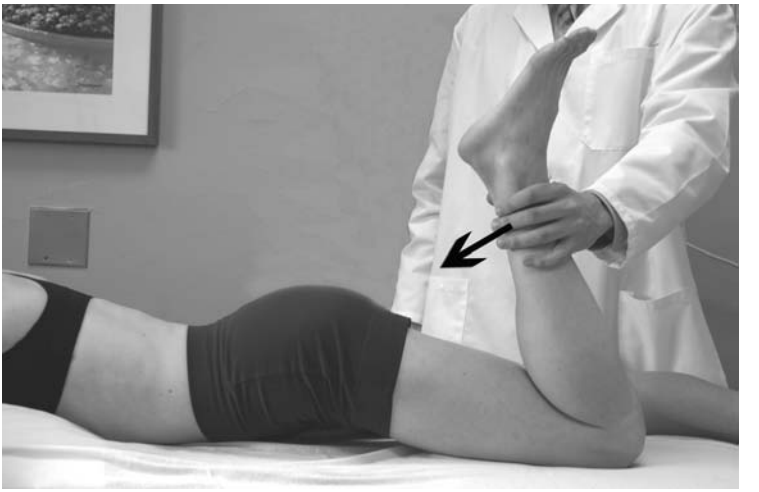

Photo 29. Stimulated positive Ely's test.

Plan

Having completed your history and physical examination, you have a good idea of what is causing your patient's symptoms. Here is what to do next:

- **Suspected lumbosacral radiculopathy**

Additional diagnostic evaluation: X-rays, including anteroposterior (AP) and lateral views, are indicated. Magnetic resonance imaging (MRI) is also indicated. Electrodiagnostic studies may be used to better localize the exact lesion and evaluate for a potential peripheral neuropathy.

Treatment: Conservative treatment, including physical therapy, nonsteroidal anti-inflammatory drugs (NSAIDs), and fluoroscopically guided epidural steroid injections, have shown good efficacy for treating most radiculopathies. Surgery is reserved for refractory cases or cases with progressive neurological deficiencies (i.e., bowel or bladder changes).

- **Suspected acute low back pain**

Additional diagnostic evaluation: Unless a more serious underlying cause is suspected (e.g., fracture, tumor), no imaging is necessary.

Treatment: Physical therapy, ergonomic training, heat, activity modification, and NSAIDs may be used as first-line therapy. Instructions on good back hygiene, including sleeping with a pillow beneath the knees when supine and using a pillow between the knees when sleeping on the side, should also be offered. If any specific muscle tightness was identified during the exam, special attention should be paid to stretching for those muscles. If trigger points are identified, trigger point injections of a local anesthetic and normal saline with or without corticosteroids may be helpful.

- **Suspected chronic low back pain**

Chronic low back pain is a diagnosis that deserves special mention. The physical exam may suggest a particular cause for chronic low back pain, but the physical exam will *not* be able to offer a conclusive diagnosis in the majority of cases of chronic low back pain. To diagnose most cases, it is necessary to perform a needle procedure. For example, in order to diagnose discogenic chronic low back pain (which accounts for approximately 39% of all chronic low back pain), it is necessary to perform a discogram (a needle procedure in which dye is injected into the intervertebral disc). In order to diagnose sacroiliac joint disease (which accounts for approximately 15% of all chronic low back pain), it is necessary to anesthetize the sacroiliac joint. In order to diagnose chronic low back pain caused by Z-joint disease (which accounts for approximately 30% of chronic low back pain), it is necessary to perform controlled blocks of the nerves innervating the putative joint(s). All of these diagnostic procedures are routinely done by an orthopedist, interventional physiatrist, or pain medicine specialist. Your history, physical exam, and radiographic findings are important in helping to guide your decision of which needle procedure to perform first.

Additional diagnostic evaluation: Needle procedures should be performed as mentioned. X-rays, including AP and lateral views, are indicated. Oblique X-ray should be obtained if a pars interarticularlis fracture is suspected. MRI is also indicated.

Treatment: Conservative care similar to that for acute low back pain may be tried if the patient has not previously had a trial of conservative modalities. If a discogram reveals that the disc is the source of pain, intradiscal electrothermal annuloplasty is a minimally invasive needle procedure that has been shown to help more than half of all patients. Surgical options, including fusion surgery, are also available. If con-

trolled blocks reveal the Z-joint to be the source of pain, radiofrequency neurotomy is an effective needle procedure for denervating the joints and relieving the pain.

- **Suspected spondylolysis**

Additional diagnostic evaluation: AP-, lateral-, and oblique-view X-rays (**Note:** an oblique lumbar view is necessary in this instance, but also note that oblique views require significantly more radiation when compared with AP and lateral views and so should be obtained only when indicated). Computed tomography (CT) may also be necessary, particularly if the lesion is suspected (e.g., young gymnast with low back pain that is worse with activity and worse with lumbar extension) but not seen on X-ray.

Treatment: Physical therapy with emphasis on posture and body biomechanics training is instituted. Activity modification is also important. Bracing may be used. Surgery should generally be considered only in those patients who have failed conservative care. If surgical fusion of the lesion is considered, a successful diagnostic block of the pars defect is a good predictor of a successful response to fusion.

- **Suspected trochanteric bursitis**

Additional diagnostic evaluation: X-rays, including AP and lateral views, may be used to rule out a fracture or bony lesion.

Treatment: Ice, NSAIDs, heat, and physical therapy with emphasis placed on stretching the iliotibial band, hip flexors, and hip extensors may be used. A trochanteric bursa injection of anesthetic and corticosteroid injection should be considered.

- **Suspected hip osteoarthritis**

Additional diagnostic evaluation: X-rays, including AP and lateral views, are indicated.

Treatment: Treatment is based on degree of morbidity. The cornerstone of conservative care includes reducing stressful activities, resting, weight reduction (when appropriate), using ambulatory aides (e.g., cane), heat modalities, and physical therapy, including nonimpact exercises (e.g., swimming). Oral glucosamine sulfate (1500 mg) and chondroitin sulfate (1200 mg) are useful when taken daily. Intra-articular injections of anesthetic and corticosteroid may also be helpful. The

decision to treat surgically is largely guided by the patient's comorbidities, expectations, and degree of symptoms. The most common surgery for hip osteoarthritis is total hip replacement.

- **Suspected hip fracture**

More common hip fractures include femoral neck fractures, intertrochanteric fractures, and subtrochanteric fractures. Acetabular fractures are less common and typically require a high energy trauma.

Additional diagnostic evaluation: X-rays, including AP and lateral views, are indicated. CT and/or MRI are also generally indicated.

Treatment: Surgery is indicated, and the sooner the fracture is reduced, the better.

- **Suspected hip dislocation**

Additional diagnostic evaluation: X-rays, including AP and lateral views are indicated. CT and/or MRI are also indicated.

Treatment: Surgery is indicated, and the sooner the hip is reduced, the better.

6 Knee Pain

First Thoughts

When your patient complains of "knee pain," without hearing another word, your differential diagnosis includes four basic etiologies:

1. Osteoarthritis.
2. Ligament damage.
3. Meniscus damage.
4. Patellofemoral disorder.

Pes anserinus bursitis, Osgood-Schlatter disease, osteochondritis dissecans, and fractures are among the other less likely causes you will need to consider. A basic history will help you narrow the diagnosis.

History

Ask the following questions:

1. Where is your pain?

This is a very high-yield question. Have your patient point to the most painful point, if possible. Pain at the joint line is the result of a collateral ligament or meniscus problem (or both) until proven otherwise. Pain at the tibial tuberosity in a young patient is Osgood-Schlatter's syndrome until proven otherwise; anterior knee pain may be a patellofemoral disorder; pain over the medial tibial plateau, approximately 2 inches below the joint line, may be pes anserinus bursitis; and pain and swelling in the posterior knee may be a Baker's cyst.

2. When did your pain begin, what were you doing at the time, and what were the initial symptoms?

This is another high-yield question. In fact, having already ascertained the location of pain, knowing the mechanism of injury and

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initial symptoms will give you the diagnosis in more than half of all cases of knee pain. If the patient has a ligament injury, the patient will report a deceleration injury or twisting the knee that led to immediate symptoms of swelling and pain. In fact, 30 to 50% of patients will report actually hearing a "pop" at the time of injury. In contrast, patients with meniscus injuries may have a similar mechanism of injury (twisting or deceleration), but the patient will not notice swelling (if swelling occurs at all) until minutes or hours after the injury. There is also no "popping" sensation or sound in meniscus injuries. In an older patient, a meniscus injury may be more insidious and the patient may not recall an inciting traumatic event. Likewise, patients with osteoarthritis, patellofemoral syndrome, and Osgood-Schlatter's syndrome have a more chronic onset of symptoms. Patients with fractures will generally report a history of trauma.

3. **Do you experience any grinding, locking, catching, or giving way of the knee?**

   This question is the last general high-yield question for most cases of knee pain. Grinding is characteristic of osteoarthritis; locking and catching are characteristic of meniscus injuries and osteochondritis dissecans (meniscus injuries are much more common than osteochondritis dissecans); and giving way is more characteristic of ligamentous injuries.

4. **Are there any positions that make your knee more or less comfortable?**

   This question is specifically targeting the diagnosis of patellofemoral syndrome. Patients with patellofemoral disorders classically report pain with prolonged knee flexion, and pain relief with knee extension. The "movie theater sign"—in which the patient complains of aching knee pain while sitting with the knees flexed in the theater for a prolonged period of time—is classic for patellofemoral syndrome. Often, to relieve the pain, the patient will report extending the leg into the aisle.

5. **What is the quality of your pain (sharp, shooting, dull, etc.)?**

   The answer to this question is most useful for gathering a general gestalt for the patient's complaint. It may not add any specific diagnostic utility, but it will give a better overall picture for the patient's problem.

6. **Have you tried anything to help the pain and, if yes, has that been successful?**

   This question is more useful for when you are contemplating diagnostic tests and treatment strategies.

7. **Other important questions to remember to ask include: Have you ever had surgery on your knee? Do you have any hip or ankle pain (both hip and ankle pain can refer pain to the knee, and vice versa)?**

Physical Exam

Having completed the history portion of your clinical exam, you are ready for the physical examination.

Observe the patient's gait as the patient walks back and forth across the room. Is the gait antalgic (does the patient favor one leg over the other)? This may not actually help you with the diagnosis, but it will help you gage the degree of impairment, guide what imaging studies to order, and help form your ultimate treatment plan.

With the patient seated, fully extend the patient's knee and determine the quadricep (Q)-angle. The Q-angle is formed by drawing an imaginary line from the anterior superior iliac spine to the center of the patella. This line is intersected by a second line from the tibial tuberosity to the center of the patella and continues superiorly along the center of the anterior thigh (Photo 1). The intersection of these two lines is called the *Q-angle*. A normal Q-angle in males is 10–15°, and in females it is 10–19°. Do not split hairs over angles. After examining several knees, you will begin to get a feel for a "normal" Q-angle and appreciate an abnormal angle. An abnormal Q-angle reflects abnormal patellar tracking and suggests an underlying patellofemoral disorder.

Next, flex and extend the patient's leg and note the tracking of the patella. Excessive lateral tracking is another indication of patellofemoral syndrome. Palpate under and around the patella with the knee in full extension (the knee must be in extension to allow palpation under the surface of the patella). Tenderness in this region is indicative of patellofemoral syndrome.

Then, flex and extend the patient's leg with one hand and palpate the patient's knee joint with the other hand. Crepitus may be an incidental finding, but it is also consistent with osteoarthritis and patellofemoral syndrome.

Next, palpate the patient's tibial tubercle. Pain and tenderness at the tibial tubercle in young individuals is consistent with Osgood-

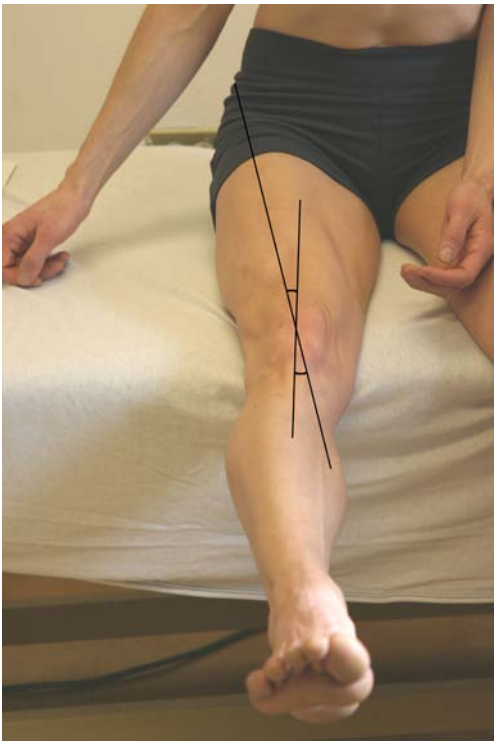

Photo 1. Q-angle.

Schlatter's syndrome. Palpate posteromedial to the tibial tubercle approximately 2 inches below the joint line (Photo 2). This area is the pes anserinus, and it is the point at which the tendons of the sartorius, gracilis, and semitendinosus muscles attach to the tibia. These muscles can be remembered by the convenient pneumonic: Say Grace Before Tea. A bursa overlies the insertion of these tendons and can become inflamed. Tenderness at this point reflects inflammation in the bursa.

While the patient is still seated with legs hanging off the examining table, palpate the patient's joint line between the femoral condyles and tibial plateau. Tenderness along the medial joint line suggests an injury of the medial meniscus or medial collateral ligament. Tenderness along the lateral joint line suggests a lateral meniscus or lateral collateral ligament injury.

Photo 2. Pes anserinus palpation.

Next, palpate the popliteal fossa and appreciate the pulsation of the popliteal artery. A small swelling in the fossa may indicate a Baker's cyst.

Following this, test the muscles of the patient's knee by having the patient extend the knee against resistance (Photo 3). This tests the quadriceps, which are innervated by the femoral nerve (L2–L4).

Next, have the patient bring the ankle underneath the table (flexing the knee) against resistance (Photo 4). This tests the patient's hamstring muscles, which are innervated primarily by the tibial portion of the sciatic nerve (L5, S1). The common peroneal portion of the sciatic nerve (L5–S2) innervates the short head of the biceps femoris.

Table 1 lists the major movements of the knee, along with the involved muscles and their innervation.

Photo 3. Knee extension against resistance.

Photo 4. Knee flexion against resistance.

Table 1
Primary Muscles and Innervation for Knee Movement

Major muscle movement	*Primary muscles involved*	*Primary innervation*
Knee flexion	Hamstrings (semimembranosus, semitendinosus, biceps femoris).	Primarily tibial, but also peroneal portion of sciatic nerve (primarily L5).
Knee extension	Quadriceps (vastus lateralis, vastus medialis, vastus intermedius, rectus femoris).	Femoral nerve (primarily L4).

Next, test the patellar reflex (L4).

With the patient still seated, test for stability of the medial collateral ligament (MCL). Do this by flexing the patient's knee to 30°. Next, secure the patient's ankle in one hand and cup the patient's knee with the other hand so that your thenar eminence is against the patient's fibular head. Place a firm valgus stress on the patient's knee by pushing medially against the patient's knee and pulling laterally against the patient's ankle—this maneuver is performed in an attempt to open the medial side of his knee (Photo 5). If there is an MCL injury, there will be medial joint-line gapping that you will appreciate with the fingers that are cupped around the patient's knee. When the valgus stress on the patient's leg is relieved, the patient's knee may be felt to "clunk" back together if there is an MCL tear.

To test for a lateral collateral ligament (LCL) tear, apply a varus stress to the patient's joint by pushing the patient's ankle medially while pulling the patient's knee laterally. Remember to keep your hand cupped around the lateral aspect of the joint in order to appreciate gapping, if present (Photo 6). MCL injuries are much more common than LCL injuries.

Next, have the patient lie in the supine position while you check for an effusion. Look for a large effusion by pushing the patient's patella superiorly and then quickly releasing it. If there is a large amount of fluid, the fluid will redistribute and push the patella into its former position. If this happens, it is called a *ballotable patella*. A ballotable patella is a sign of a major effusion. To check for a smaller effusion,

Photo 5. Valgus stress to test the medial collateral ligament.

Photo 6. Varus stress to test lateral collateral ligament.

you may need to milk the fluid from the suprapatellar pouch and the lateral side of the knee over to the medial side of the knee. Then, you would release the fluid and tap the medial aspect of the knee. In the next few seconds, if an effusion is present, then the fluid will redistribute laterally and a fullness will develop on the lateral side of the knee.

Now, test for an anterior cruciate ligament (ACL) tear. The most *sensitive* clinical test for an ACL tear is the Lachman test. The Lachman test is performed by flexing the patient's knee to 20° and stabilizing the patient's femur with one hand and pulling the tibia toward you with the other hand. First, test the normal leg to establish the baseline endpoint. This is important because a few degrees of anterior glide of the tibia on the femur may be normal. Next, test the pathologic leg. Increased glide or a loose endpoint suggests an ACL tear.

The anterior drawer test is a similar test that should also be performed to evaluate for an ACL injury. In this test, the patient's knee is flexed to 90° with the feet flat on the table. The examiner sits on the patient's foot to stabilize it, and with the examiner's hands cupped around the back of the patient's upper calf, the tibia is pulled toward the examiner (Photo 7). If the tibia slides forward from under the femur more than a few degrees, there may be a tear in the ACL.

Photo 7. Anterior drawer test.

Photo 8. Posterior drawer test.

If the patient has a positive anterior drawer sign or Lachman test, repeat the maneuver with the patient's leg in external and internal rotation. Repeating the maneuver with the leg in external rotation should tighten the posteromedial portion of the capsule. If the patient's tibia glides forward as much as it did with the leg in the neutral position, an MCL tear may be accompanying the potential ACL tear. Repeating the test with the leg in internal rotation tightens the posterolateral capsule. If the patient's tibia again glides forward as much as it did with the leg in the neutral position, an LCL tear may be accompanying the potential ACL tear.

To test for a posterior cruciate ligament (PCL) tear, the examiner stays seated on the patient's foot as for the anterior drawer test. However, instead of pulling the patient's tibia toward the examiner, the tibia is pushed posteriorly (Photo 8). If the patient's tibia glides posteriorly on the femur, it is likely torn, although the PCL is rarely torn. The posterior sag sign is also used to evaluate for a PCL injury. In this sign, the patient's hip is flexed to 45° and the knee is flexed to 90°. The examiner supports the limb by holding the patient's ankle (Photo 9). In a patient with a PCL tear, the tibia will posteriorly translate on the femur.

A torn meniscus is a common injury. Tenderness to palpation at the joint line (which you have already assessed) is a good indication that

Photo 9. Posterior sag sign.

the meniscus is injured. A few special tests are very useful to further investigate the menisci. The McMurray test was designed to diagnose a tear in the posterior medial meniscus because the posterior horn of the medial meniscus is difficult to palpate. To perform the McMurray test, the examiner instructs the patient to lie supine with legs extended. The examiner then takes hold of the patient's heel and fully flexes the leg. Using the ankle as a fulcrum, the examiner rotates the patient's leg internally and externally to loosen up the knee joint. With the knee joint loose and fully flexed, the examiner continues to use the ankle as a fulcrum and puts the leg into external rotation at the same time as the examiner uses the other hand to push the patient's knee medially, applying a valgus stress. The examiner then slowly extends the knee, maintaining the leg in external rotation and under valgus stress (Photo 10). If this maneuver elicits a palpable or audible click in the patient's knee, the posterior half of the medial meniscus is probably torn.

Another good test to help differentiate between a meniscus tear and a collateral ligament tear is the Apley compression and distraction test. To perform this test, the patient is instructed to lie in the prone position. The examiner stabilizes the thigh with one hand and flexes the patient's knee to 90° with the other hand. The examiner then applies downward pressure to the patient's heel as the examiner internally and

Photo 10. McMurray test.

Photo 11. Apley compression test.

Photo 12. Apley distraction test.

externally rotates the patient's leg (using the patient's heel as the fulcrum) (Photo 11). This is the Apley Compression test. When this maneuver elicits medial pain, the patient may have a medial meniscus or ligament tear. When this maneuver elicits pain on the lateral side, the patient may have a lateral meniscus or ligament tear.

To help differentiate a torn meniscus from a torn ligament, the Apley distraction test is performed next. In the distraction test, the examiner and patient remain in the same position as for the compression test, but in this test the examiner *pulls upward* on the patient's ankle and, still using the ankle as a fulcrum, continues to rotate the patient's leg into internal and external rotation (Photo 12). This maneuver unloads the pressure from the meniscus. Therefore, if this maneuver also elicits pain, the pain is likely coming from an injured ligament and not the meniscus.

Finally, test for osteochondritis dissecans (OCD) of the medial femoral condyle of the knee using Wilson's sign. OCD is a condition in which a fragment of cartilage and subchondral bone separates from an intact articular surface. In the knee, OCD occurs at the medial femoral condyle approximately 80% of the time. To test for Wilson's sign, the examiner has the patient return to lying in the supine position. The examiner takes the patient's knee and ankle and flexes the hip and knee to 90°. Using the patient's ankle as a fulcrum, the examiner internally rotates the leg and then slowly extends the knee (Photo 13). At approximately 30° of flexion, this maneuver most closely abuts the tibial spine against the medial femoral condyle. When this maneuver elicits pain at approximately 30° of flexion, the patient has a positive Wilson's sign. When a positive Wilson's sign is elicited, the examiner next externally

Photo 13. Wilson's sign.

rotates the leg, moving the tibial spine away from the medial femoral condyle. This external rotation should alleviate the patient's pain in a true positive Wilson's sign. If the patient's pain is not alleviated with external rotation, it may be a false positive Wilson's sign.

Plan

Having completed your history and physical examination, you have a good idea of what is wrong with your patient's knee. The following are some general recommendations for what to do next:

- **Suspected ACL tear**

Additional diagnostic evaluation: X-rays, including anteroposterior (AP), lateral, and sunrise views, are taken to rule out fracture. Magnetic resonance imaging (MRI) may be ordered to better delineate the injury.

Treatment: Bracing, nonsteroidal anti-inflammatory drugs (NSAIDs), and physical therapy emphasizing strengthening and stretching the quadriceps and hamstrings, is first-line treatment. Depending on the extent of injury, surgical reconstruction may be necessary.

- **Suspected PCL tear**

Additional diagnostic evaluation: X-rays, including AP, lateral, and sunrise views, should be obtained. MRI may be ordered to delineate the injury.

Treatment: First-line treatment includes rest, ice, physical therapy emphasizing quadriceps strengthening and stretching, and bracing. Depending on the extent of injury, surgery may be required.

- **Suspected MCL injury**

Additional diagnostic evaluation: X-rays, including AP and lateral views, should be obtained. MRI may be ordered when an associated injury is suspected.

Treatment: First-line treatment includes rest, ice, elevation of the joint, physical therapy emphasizing stretching and strengthening exercises, bracing, and crutches until weight-bearing is comfortable. Surgery is rarely necessary.

- **Suspected LCL injury**

Additional diagnostic evaluation: X-rays, including AP and lateral views, should be obtained. MRI may also be helpful.

Treatment: First-line treatment includes rest, ice, NSAIDs, and physical therapy emphasizing stretching and strengthening the quadriceps. Surgery may be required depending on the extent of injury.

- **Suspected meniscus tear**

Additional diagnostic evaluation: X-rays, including AP weight-bearing, AP in 45° extension, lateral, and sunrise views, should be obtained. MRI should also be obtained to better evaluate the extent of injury. Arthroscopy is the gold standard diagnostic tool for meniscal tears but may not be necessary.

Treatment: Small tears may be treated conservatively with rest, ice, bracing, and physical therapy. Larger tears and tears in patients who are competitive athletes and wish to return to competitive sport may require surgery.

- **Suspected patellofemoral disorder**

Additional diagnostic evaluation: X-rays, including AP, lateral, and sunrise views, should be obtained.

Treatment: Rest, NSAIDs, patellar bracing and/or taping, and physical therapy that emphasizes quadriceps stretching and strengthening and straight leg-raising with the leg externally rotated to particularly focus on the vastus medialis oblique, is first-line treatment. Surgery should be reserved for patients who fail to respond to at least several months of aggressive conservative care.

- **Suspected osteoarthritis**

Additional diagnostic evaluation: X-rays, including AP, lateral, sunrise, and posteroanterior views with the knee flexed to 45°, should be obtained.

Treatment: Conservative care, including rest, weight loss (when appropriate), physical therapy—including nonimpact exercises, such as swimming—acetaminophen, NSAIDs, heat modalities, activity modification, ambulatory aids, such as a cane, should be used. Topical analgesic therapy with methylsalicylate or capsaicin cream may be beneficial. Oral glucosamine sulfate (1500 mg) and chondroitin sulfate (1200 mg) taken daily are also helpful. Intra-articular injections of hyaluronic acid improve symptoms temporarily but typically need to be repeated periodically (about once every 6 months). Intra-articular injec-

tions of corticosteroid and anesthetic may also be helpful. Surgical options are reserved for persistent or severe symptoms and include arthroscopy, osteotomy, and total knee replacement.

- **Suspected prepatellar bursitis**

Additional diagnostic evaluation: X-rays, including AP and lateral views, may be obtained to rule out a more serious underlying process.

Treatment: NSAIDs, activity modification, knee pads, and a corticosteroid and anesthetic injection may be helpful.

- **Suspected pes anserine bursitis**

Additional diagnostic evaluation: X-rays, including AP and lateral views, may be obtained to rule out a more serious underlying disorder.

Treatment: NSAIDs, rest, activity modification, physical therapy emphasizing stretching and strengthening of the hamstrings and quadriceps and a corticosteroid and anesthetic injection may be helpful.

- **Suspected OCD**

Additional diagnostic evaluation: X-rays, including AP and lateral views, and MRI should be obtained.

Treatment: Conservative care includes physical therapy and bracing. Depending on the age of the patient and extent of injury, surgery may be necessary. Adults generally require surgery, whereas children and adolescents with skeletally immature bones may be treated conservatively.

- **Suspected Osgood-Schlatter's disease**

Additional diagnostic evaluation: X-rays, including AP and lateral views, may be obtained.

Treatment: Activity restriction and/or modification, an infrapatellar strap, and physical therapy emphasizing stretching and strengthening of the quadriceps and hamstrings, are generally sufficient for treatment.

7 Ankle Pain

First Thoughts

When a patient complains of "ankle pain," without hearing another word your differential diagnosis includes the following three common etiologies:

1. Ligament injury.
2. Achilles tendonitis.
3. Ankle fracture.

Less common problems that you must still consider include capsular injury, posterior tibial tendonitis, tarsal tunnel syndrome, osteochondritis dissecans (OCD), and anterior impingement syndrome. The history and physical examination will help you narrow your differential diagnosis.

History

Ask the following questions:

1. Where is your pain?

This is a high-yield question. Lateral pain suggests a ligament injury or a possible fracture. Medial pain suggests a ligament injury (rare on the medial side), possible fracture, or posterior tibial tendonitis. Anterior pain suggests anterior capsule injury or anterior bony impingement. Posterior pain suggests Achilles tendinitis. OCD may occur on the lateral or medial aspect of the ankle, but it is a relatively uncommon disorder.

2. When did your pain begin and what were you doing at the time?

This is another high-yield question. In fact, between knowing the location of the patient's pain and how the pain started, you may be

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able to diagnose the pathology of many, if not most, of your patients with ankle pain before even laying hands or eyes on their ankles. Almost all ankle sprains are lateral sprains and occur after an inversion injury. The typical history a patient will give is falling over a turned-in (inverted) ankle while playing a sport or walking in the street.

However, if the patient suffered an ankle fracture, he or she will give a history of a more significant trauma, such as participation in a sporting event in which another player fell on the ankle. If the patient has an anterior capsular strain, the patient may be a softball or baseball player who was injured during a hook-slide into a base. If the patient has Achilles tendonitis, he or she may be a runner, dancer, or other athlete who complains of gradually increasing pain in the Achilles tendon that is made worse with activity. If the patient has posterior tibial tendonitis, the patient is probably a young runner who presents with a complaint of pain at the medial aspect of the ankle with weight-bearing. The patient will report that the pain is worse in the morning and also increases with activity. If the patient has anterior bony impingement syndrome, the patient may be a dancer or basketball player who recalls a history of trauma leading to acute pain followed by chronic, vague pain that is made worse on landing from jumps.

3. **Do you experience any locking or catching in your ankle?**

   This question most directly focuses on OCD. Patients with ankle OCD may have locking and/or catching. OCD is a condition in which a fragment of cartilage and subchondral bone separates from an intact articular surface. In contrast to OCD in other parts of the body, ankle OCD is more typically precipitated by a traumatic insult.

4. **Have you ever had surgery on your ankle?**

   This question is important for many reasons including that patients with a history of ankle surgery are predisposed to premature osteoarthritis in the ankle.

5. **What is the quality of your ankle pain (sharp, shooting, dull, aching, burning)?**

   Patients with tarsal tunnel syndrome may have shooting pains, tingling, and burning radiating from the tarsal tunnel (posterior to the medial malleolus) to the sole of the foot. The answer to this question is also useful for obtaining a gestalt of the patient's pain.

6. **Other questions include: Is there anything you have done for your ankle that has helped the pain? Are you able to bear weight on your ankle?**

   These questions are more important for when you consider what imaging studies to order and what treatment to offer the patient.

Physical Exam

Having completed taking your patient's history, you are ready to perform your physical exam.

Observe the patient walking back and forth in the examining room. Is the gait antalgic (i.e., is the patient limping)? Is the patient able to bear weight on the ankle? The patient's weight-bearing status is more important for prognosis, imaging, and treatment considerations than it is for diagnosis, but it should be noted.

Have the patient sit down on the examining table. After an initial survey of the patient's ankles for symmetry and swelling, take the affected ankle in your hand. With your fingers, trace the tibia inferiorly until it ends in the medial malleolus. Palpate the strong medial collateral ligament (MCL; deltoid ligament) that is just inferior to the medial malleolus. Note that this strong ligament is harder to palpate than its lateral counterparts. Tenderness over the MCL may indicate a ligamentous tear from an eversion injury.

Next, move your fingers to the soft tissue depression between the medial malleolus and the calcaneus (heel). The tarsal tunnel is in this depression. The tendons of the flexor hallucis longus muscle, flexor digitorum longus muscle, tibialis posterior muscle, the posterior tibial artery, and posterior tibial nerve run in the tarsal tunnel. Check for the posterior tibial artery's pulse.

To accentuate the tibialis posterior tendon, have the patient invert and plantarflex the foot. Tenderness over this tendon may reflect tibialis posterior tendonitis (Photo 1). Also, check for tibialis posterior tendonitis at its origin in the medial superior half of the tibia. This disorder is sometimes termed "shin splints." To check for this disorder, have the patient invert the foot against resistance. When this maneuver elicits pain along the proximal or middle tibia, the patient may have tibialis posterior tendonitis. When the patient localizes the pain with resisted inversion to the posterior medial malleolus, the patient may have tibialis posterior tendonitis at the point of pain elicitation.

To evaluate for tarsal tunnel syndrome, check for a positive Tinel's sign. To elicit this sign, the tarsal tunnel is repetitively tapped. When

Photo 1. Ankle inversion and plantarflexion accentuating the tibialis posterior tendon.

this tapping elicits radiating pain, burning, numbness, and/or tingling in the distribution of the posterior tibial nerve along the medial malleolus and/or sole of the foot, the sign is positive and indicates that the patient may have tarsal tunnel syndrome. Manual compression of the nerve at the tarsal tunnel for 60 seconds is also used to diagnose tarsal tunnel syndrome (Photo 2). When compression of the nerve for 60 seconds reproduces your patient's symptoms, the test is positive for tarsal tunnel syndrome.

Now, move your fingers to the posterior ankle and palpate the large Achilles tendon (this is the thickest and strongest tendon in the body). Tenderness over the Achilles tendon implicates Achilles tendonitis as the source of pain. Trace the Achilles tendon inferiorly and note

Photo 2. Tarsal tunnel compression.

the insertion of the Achilles tendon into the calcaneus. A bursa lies between the anterior surface of the Achilles tendon and the calcaneus. Another bursa lies between the insertion of the Achilles tendon and the overlying skin. Either of these two bursae may become inflamed and cause pain. Tenderness over the bursa implicates bursitis as the cause of pain. These bursae are discussed more fully in Chapter 8.

If the patient has complained of trauma to the Achilles tendon or a sudden exertion in which pushing off from the patient's toes resulted in severe pain, swelling, and weakness in the calf, then the patient may have ruptured the Achilles tendon. If a defect in the Achilles tendon is present, you may be able to palpate it. Another good test for a rupture of the Achilles tendon is to have the patient lie in the prone position with the patient's legs dangling off the edge of the examining table. Next,

Photo 3. Thompson test.

squeeze the patient's calf (Photo 3). If the foot fails to plantarflex or only partly plantarflexes, the patient probably has a ruptured Achilles tendon. This maneuver is called the Thompson test.

Test the muscles of the ankle by first having the patient dorsiflex the foot against resistance (Photo 4). This tests the tibialis anterior muscle, which is innervated by the deep peroneal nerve (L4).

Next, have the patient plantarflex the foot against resistance (Photo 5). This tests the patient's gastrocneumius and soleus muscles, which are innervated by the tibial nerve (primarily S1).

Then, test the Achilles reflex (S1).

Assess the integrity of the ligaments of the patient's ankle joint. The anterior talofibular ligament (ATFL) attaches from the anterior portion of the lateral malleolus to the lateral aspect of the talar neck in the

Photo 4. Ankle dorsiflexion against resistance.

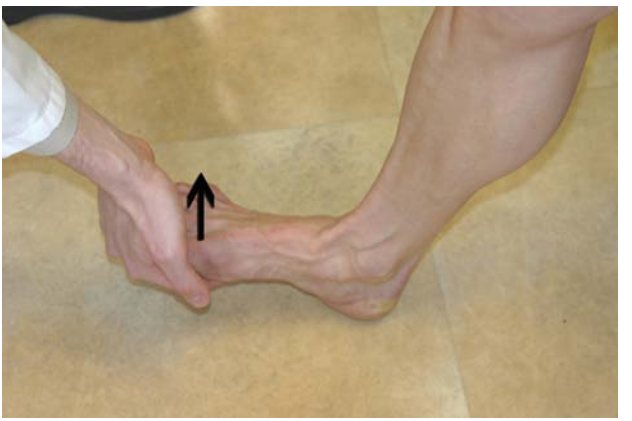


Photo 5. Ankle plantarflexion against resistance.

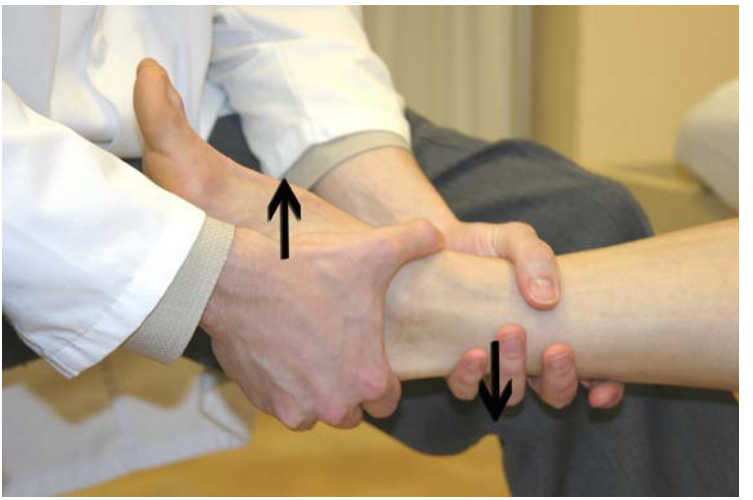


Photo 6. Anterior drawer test.

foot. The ATFL is the most commonly sprained ankle ligament in part because it is the first to be stressed during inversion and plantar flexion. To test the ATFL, first check for ATFL tenderness. Next, put the ankle into plantar flexion and inversion. If this causes pain, the ATFL is probably injured. To further test the ATFL, perform the anterior drawer test. To perform this test, with the patient's foot in a few degrees of plantar flexion, take hold of the patient's lower tibia with one hand and grip the patient's calcaneus with the palm of the other hand. Pull the patient's calcaneus (and talus) anteriorly toward you while you simultaneously push the patient's tibia posteriorly away from you (Photo 6). The ATFL is the only ligament resisting this anterior talar subluxation. Increased subluxation and/or a clunking sensation with subluxation reflect a torn ATFL.

The calcaneofibular ligament (CFL) attaches the fibula to the lateral wall of the calcaneus. The CFL is the second ligament to be torn in an ankle sprain. For an ankle to be unstable, both the ATFL and the CFL must be torn. To test for the integrity of the CFL and ATFL, invert the patient's calcaneus and assess for gapping of the talar joint (Photo 7). Increased gapping (compared with the unaffected limb) indicates a torn ATFL and CFL and reflects ankle instability.

Photo 7. Talar tilt test.

The posterior talofibular ligament (PTFL) is the third ligament in the lateral ankle to be sprained. The PTFL attaches from the posterior edge of the lateral malleolus to the posterior aspect of the talus. Because of its position and strength, the PTFL is rarely torn except in severe ankle injuries, such as dislocation.

Having assessed the integrity of the lateral ligaments, next assess the integrity of the MCL. Stabilize the patient's leg by holding the patient's tibia and calcaneus and evert the foot (Photo 8). Increased gapping at the medial ankle reflects a tear in the medial collateral ligament.

Finally, if you are concerned about a possible stress fracture in the lower leg or foot, place a tuning fork onto the painful area or area of localized tenderness *over the bone*. Vibration causes increased pain in a stress fracture. Confirm your findings with imaging studies (usually X-rays).

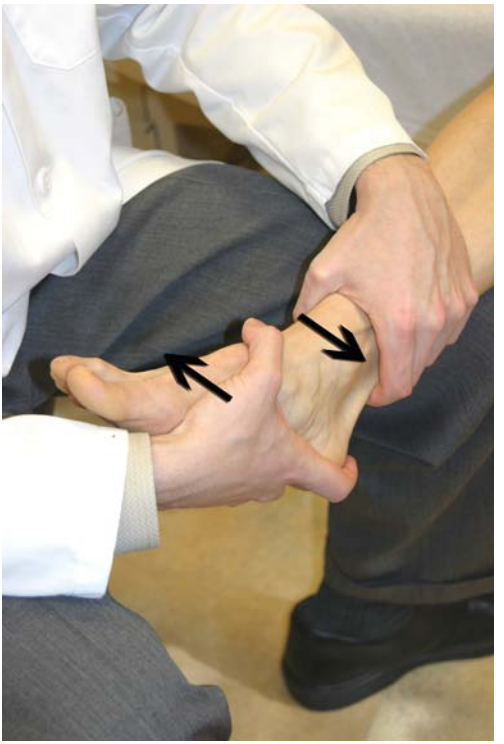


Photo 8. Eversion stress to test the deltoid ligament.

Plan

Having completed your history and physical examination, you have a good idea of what is wrong with your patient's ankle. Here is what to do next:

- **Suspected ankle sprain**

Additional diagnostic evaluation: The Ottawa ankle rules were designed to offer an evidence-based approach to determine which patients with a suspected ankle sprain require X-rays and which do not. All patients with a suspected ankle sprain require radiographs *except* patients who are younger than 55 years old, able to walk four steps at

the time of injury and at the time of evaluation, and who do not have tenderness over the posterior edge of the medial malleolus. If the diagnosis is in doubt, or concomitant injury to the soft tissues is suspected, magnetic resonance imaging (MRI) may also be very helpful.

Treatment: most ankle sprains may be managed conservatively with rest, ice, compression, and protective devices, such as an air cast (or other brace). Physical therapy that emphasizes range of motion, proprioceptive, and strengthening exercises is also helpful. Return to sport is governed primarily by symptoms. In general, once a patient can run, jump 10 times on the injured foot, stand for 1 min with eyes closed on the injured foot, and pivot quickly without significant pain, the patient is ready to return to sport. Most ankle sprains do not require surgery. Indications for surgery may include severe MCL sprains.

- **Suspected Achilles tendonitis**

Additional diagnostic evaluation: X-rays, including anteroposterior (AP) and lateral views, may reveal a spur at the Achilles tendon insertion. However, X-rays are not always necessary.

Treatment: Conservative care is first-line therapy and includes rest, orthotics, ice, and physical therapy.

- **Suspected retrocalcaneal bursitis**

See Chapter 8 for discussion.

- **Suspected anterior impingement syndrome**

Additional diagnostic evaluation: None necessary.

Treatment: Conservative care is first-line therapy with ice, rest, nonsteroidal anti-inflammatory drugs (NSAIDs), and physical therapy. Surgery is occasionally necessary.

- **Suspected tarsal tunnel syndrome**

Additional diagnostic evaluation: X-rays, including AP and lateral views, may be obtained to rule out other pathological processes. Electrodiagnostic studies may be used to confirm the diagnosis.

Treatment: Rest, ice, NSAIDs, lidocaine patch, and/or a steroid and anesthetic injection are helpful. Surgical release is reserved for severe cases that are not responsive to conservative care.

- **Suspected osteoarthritis**

Additional diagnostic evaluation: X-rays, including standing AP and lateral views, should be obtained.

Treatment: Conservative care, including weight loss, rest, activity modification, nonweight-bearing exercises, acetaminophen, and NSAIDs, may be used. Intra-articular injection of corticosteroid and anesthetic may also be helpful. Surgery is rare and reserved for severe cases that are not responsive to more conservative measures.

- **Suspected Achilles tendon rupture**

Additional diagnostic evaluation: X-rays, including standing AP and lateral views, should be obtained to rule out associated injury. Ultrasound and/or MRI may be obtained to confirm the diagnosis.

Treatment: Surgical repair is often necessary and is recommended for most patients who can tolerate the surgery. Repair is particularly recommended in young and/or active patients wishing to return to an active lifestyle. More conservative measures include bracing. Physical therapy is started after surgical repair or a period of bracing.

- **Suspected ankle fracture**

Ankle fractures include fracture of the medial malleolus, lateral malleolus, or both malleoli. When both malleoli are involved, the fracture is unstable. Associated ligamentous injury may also make the fracture unstable.

Additional diagnostic evaluation: X-rays, including AP, lateral, and mortise views with the foot in 15–20° of rotation, should be obtained. Occasionally bone scan and/or computed tomography may be necessary.

Treatment: If the fracture is stable, casting for 1–2 months may be sufficient. Unstable or displaced fractures require surgical intervention.

8 Foot Pain

First Thoughts

When a patient complains of "foot pain," your differential diagnosis of most common causes is fairly broad and includes fracture, interdigital (Morton's) neuroma, tarsal tunnel syndrome, hallux valgus, hallux rigidus, retrocalcaneal or calcaneal bursitis, sesamoiditis, and plantar fasciitis. Do not be intimidated by the relatively large differential diagnosis. Thankfully, a brief history and physical exam will differentiate most common etiologies of foot pain. In addition, the most common underlying causes of foot pain are generally identifiable and easily corrected. The most common causes are footwear, footwear, and/or footwear. Indeed, most cases of foot pain can be blamed, at least in part, on the ergonomically challenged fashion sensibilities of the modern world: narrow shoes with poor arch supports and small toe-boxes. Luckily, many cases of foot pain can be treated with sensible shoes and quality orthotics.

History

Ask the following questions:

1. **Where is your pain?**

   This high-yield question, in combination with a glance at your patient's footwear, will give you the diagnosis in many cases. If the patient points at the first metatarsophalangeal joint, then the patient probably has hallux rigidus caused, in part, by ill-fitting shoes. If the patient points at the first metatarsocuneiform joint, the patient probably has hallux valgus (bunions) that are usually caused by a small toe-box in the shoe. If the patient points to the second or third interdigital

From: *Pocket Guide to Musculoskeletal Diagnosis*
By: G. Cooper © Humana Press Inc., Totowa, NJ

space, the patient has an interdigital neuroma that is generally caused by a narrow shoe toe-box. Pain in the metatarsals (particularly the second metatarsal) may be metatarsalgia. If the patient points to the bottom of the foot, the patient may have a stress fracture, tarsal tunnel syndrome, plantar fasciitis, calcaneal bursitis, or retrocalcaneal bursitis. Pain beneath the first metatarsal head may be sesamoiditis. Pain at the ball of the foot may be a contusion or stress fracture of one of the sesamoid bones. Further questioning will help distinguish these disorders.

2. **How and when did your pain begin?**

   If the patient has plantar fasciitis, the patient will give a history of insidious onset of *medial* plantar heel pain that begins on taking the first step of the morning. Classically, the pain alleviates after a few steps but tends to return later in the evening.

   Patients with sesamoiditis complain of pain that began or became more pronounced during jumping or pushing off to run. Patients with calcaneal or retrocalcaneal bursitis may complain of pain with running. Patients with stress fractures complain of progressively worsening pain that usually is precipitated by an increase in activity intensity. For example, if the patient begins training for a marathon and is running more than usual, the patient may develop a stress fracture. Patients with an interdigital neuroma, metatarsalgia, hallux valgus, or hallux rigidus may complain of pain that began with a change in footwear. The pain will be worse after wearing the new shoes for a whole day. An insidious onset of intractable heel pain is indicative of tarsal tunnel syndrome.

3. **What is the quality of your pain (e.g., sharp, dull, aching, burning, electric)?**

   Patients with tarsal tunnel syndrome will complain of numbness and burning in addition to pain behind the medial malleolus and at the sole of the foot.

4. **Other important questions to ask include: What makes the pain better or worse? Are you able to bear weight? These questions are most helpful when deciding on imaging studies and treatment.**

Physical Exam

Having completed taking your patient's history, you are ready to perform your physical exam.

Instruct the patient to stand barefoot in front of you. Note any asymmetry in the arches of the feet. Next, palpate the patient's foot beginning with the first digit (hallux). Instruct the patient to dorsiflex as you dorsally palpate the first digit. Tenderness with this maneuver indicates an underlying sesamoiditis. Tenderness and decreased range of motion of the first metatarsalphalangeal (MTP) joint may indicate hallux rigidus. Pain elicited by resisted plantarflexion of the first digit may indicate flexor hallucis longus tenosynovitis. Tenderness to palpation over the fifth MTP indicates a Jones fracture, until proven oth-erwise with radiographs.

Squeezing the metatarsal bones together while simultaneously palpating a painful web space is the compression test for interdigital neuroma. If an interdigital neuroma is present, the involved web space should be tender to palpation with this maneuver.

Allow the patient's history to further guide your physical examination. Palpate the bones of the foot, paying particular attention to any painful areas. Tenderness over a bone may indicate a stress fracture. Place a vibrating tuning fork over the bony tender spot. Stress fractures will have increased pain with vibration. Palpate the calcaneal and retrocalcaneal bursae (Photo 1). Tenderness over one of the bursae indicates a bursitis.

Tarsal tunnel syndrome may cause pain, tingling, burning, and/or numbness in the sole of the foot. This exam and the management of this syndrome are discussed in Chapter 7.

Passive dorsiflexion will stretch the plantar fascia and pain with this maneuver reveals plantar fasciitis (Photo 2). Medial heel tenderness at the plantar fascia attachments may also indicate plantar fasciitis.

Part of the physical examination of a patient with foot pain includes examining the patient's footwear. As you examine the footwear, ask yourself the following questions: are the shoes causing the foot pain? Note the size of the toe-box. Is there enough room for the toes? Is there enough of an arch support for the patient's feet? Is one side of the shoe being worn down more than normal? Would orthotics be helpful for this patient?

Plan

Having completed your history and physical examination, you have a good idea of what is causing your patient's foot pain. Here is what to do next:

Photo 1. Calcaneal and retrocalcaneal bursa palpation.

Photo 2. Passive dorsiflexion.

- **Suspected metatarsalgia**

Additional diagnostic evaluation: X-rays, including standing anteroposterior (AP) and lateral views, should be obtained to rule out fracture.

Treatment: Metatarsal pads are very effective. Shoes with a wider toe-box and good arch support may also be helpful.

- **Suspected hallux valgus (bunion)**

Additional diagnostic evaluation: X-rays, including standing AP and lateral views, should be obtained.

Treatment: Conservative care includes shoes with a wide toe-box and orthotics. Surgical excision of the deformity is reserved for severe cases that do not respond to conservative care.

- **Suspected retrocalcaneal bursitis**

Additional diagnostic evaluation: X-rays, including standing AP and lateral views, may be obtained.

Treatment: Conservative care, including Achilles tendon stretching, activity modification, and orthotics, is usually successful. Surgical treatment is reserved for severe cases resistant to conservative care.

- **Suspected Morton's neuroma**

Additional diagnostic evaluation: None necessary.

Treatment: Conservative treatment is the initial management and may include rest, a metatarsal pad, and/or a corticosteroid and anesthetic injection. Surgical nerve excision is reserved for severe cases that do not respond to more conservative treatment.

- **Suspected plantar fasciitis**

Additional diagnostic evaluation: None necessary.

Treatment: Conservative care is usually adequate and includes rest, passive stretching, ice and/or heat, and nonsteroidal anti-inflammatory drugs (NSAIDs). A corticosteroid and anesthetic injection may also be helpful. Surgical endoscopic plantar fascia release is reserved for severe or recalcitrant symptoms.

- **Suspected tarsal tunnel syndrome**

Discussed in Chapter 7.

- **Suspected flexor hallucis longis tenosynovitis**

Additional diagnostic evaluation: X-rays, including standing AP and lateral views, may be helpful. Magnetic resonance imaging (MRI) and/or ultrasound may be used to rule out associated pathology and evaluate the extent of injury.

Treatment: Conservative care includes rest, ice, activity modification, and NSAIDs. Surgical release is rarely necessary.

- **Suspected Jones fracture (fifth metatarsal fracture)**

Additional diagnostic evaluation: X-rays, including AP, lateral, and oblique views, should be obtained.

Treatment: Casting for 6 to 8 weeks and nonweight-bearing status is used to treat some Jones fractures. Surgery may be necessary for intra-articular tuberosity fractures.

- **Suspected stress fracture**

Additional diagnostic evaluation: X-rays, including AP, lateral, and oblique views, should be obtained, but it must be remembered that X-rays may not show changes for up to 3 weeks after a stress fracture. Bone scan and MRI may help confirm the diagnosis and may be positive as little as 2 days after stress fracture.

Treatment: Nondisplaced fractures (except in the case of a Jones fracture, navicular bone, or other high-risk location fracture) may generally be treated with rest, ice, orthotics, and a walking cast. Displaced fractures (or fractures in a high-risk location) generally require surgery.

Index

EXPLORACIÓN DE LA EXTREMIDAD INFERIOR (1)

CADERA

BASES

Inspección

ASIMETRIA
Posición de la extremidad en reposo
Alineación de las extremidades (varo, valgo)
Atrofias o asimetrías musculares
Alteraciones articulares o periarticulares

Palpación

De **TODAS** las
Articulaciones (incluyendo compresión y tracción)
Huesos, Ligamentos y Tendones
Músculos (atrofia, hipertrofia, sensibilidad, espasmo)
Tono muscular

Sensibilidad

Táctil
Dolorosa
Profunda

Marcha

Postura
Balanceo
Inclinación pelvis
Distancia entre talones

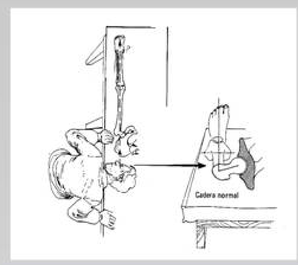
Motor

Fuerza Muscular (de 0 a 5) Activa
Fuerza Muscular (de 0 a 5) Contraresistencia
Movilidad Pasiva
Reflejos Osteotendinosos

Vascular

Femoral
Poplitea
Tibial posterior
Pedia

INSPECCIÓN



Aspecto de la pelvis, alineación de las extremidades, atrofias, bultos, deformidades y lesiones superficiales

PALPACIÓN

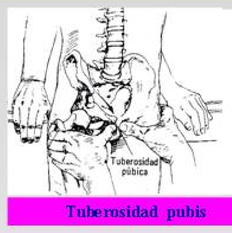
ARTICULACIONES

Compresión del anillo pelviano

Bolsa trocantérica

ESTRUCTURAS

Bolsa ileopectínea



Tuberosidad pubis

Bolsa isquioglutea

MUSCULOS

Gluteos

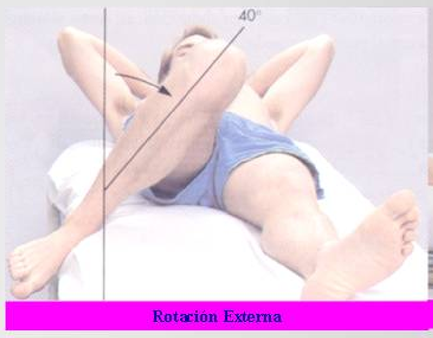
Extensores - Flexores

Aductores

MOVILIDAD ACTIVA

Flexión Extensión

Abducción - Aducción



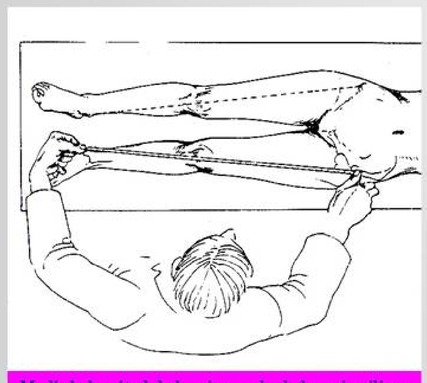
Rotación Externa

Rotación Interna

MOVILIDAD CONTRARESISTENCIA

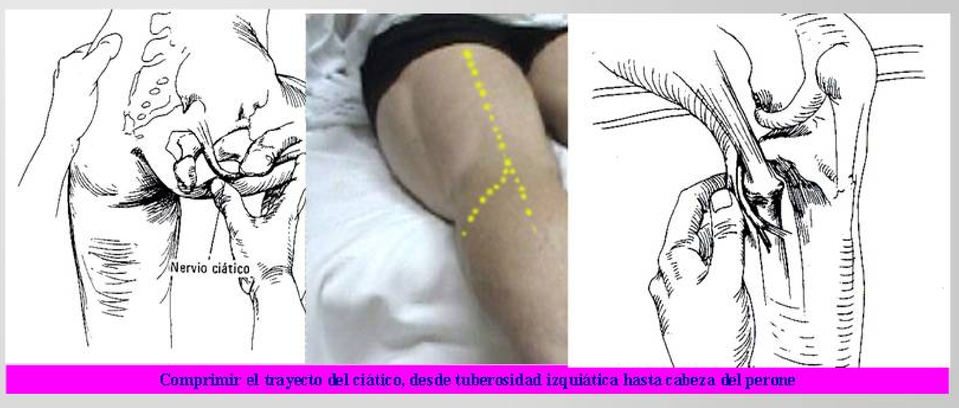
PRUEBAS ESPECIALES

Maniobra de Ortolani, muy importante en niños para descartar una luxacion congenita de cadera



Medir la longitud de las pierna, desde la espina iliaca anterosuperior al maleolo interno

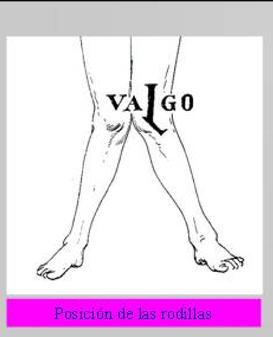
Elevación de la pierna hasta que aparezca dolor (Lasegue)



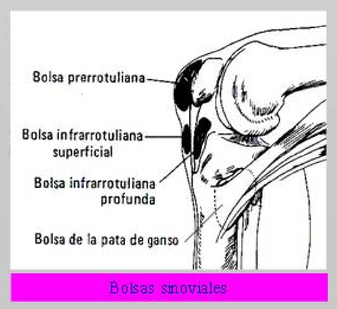
Comprimir el trayecto del ciático, desde tuberosidad izquiática hasta cabeza del perone

RODILLA

RECUERDO ANATOMICO



Posición de las rodillas



Bolsas sinoviales

Ligamentos principales y Meniscos

INSPECCIÓN

Aspecto de la rodilla, rotula, tuberosidad tibial, atrofias, bultos, deformidades y lesiones superficiales

EXPLORACIÓN DE LA EXTREMIDAD INFERIOR (2)

RODILLA

PALPACIÓN

ARTICULACIONES

Rotula anterior, laterales, superior e inferior

Compresión articulación rotuliana

Interlinea en ambos laterales

ESTRUCTURAS

Bolsa sinoviales

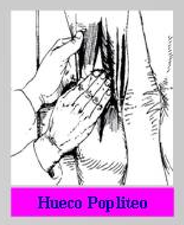
Tendones y Ligamentos

MUSCULOS

Extensores - Flexores

Muslo - Pantorrilla

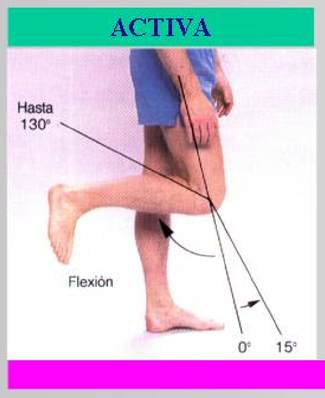
OTROS



Hueco Popliteo

MOVILIDAD

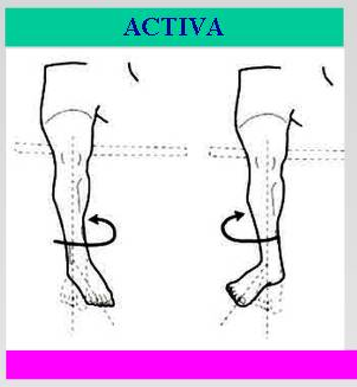
ACTIVA



CONTRARESISTENCIA

Flexión Extensión

ACTIVA

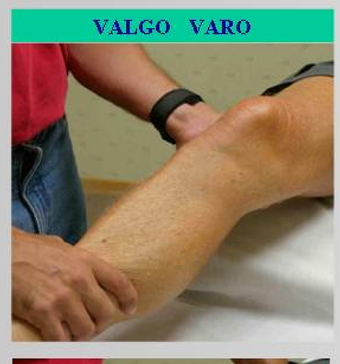


CONTRARESISTENCIA

Rotación Interna **Rotación Externa**

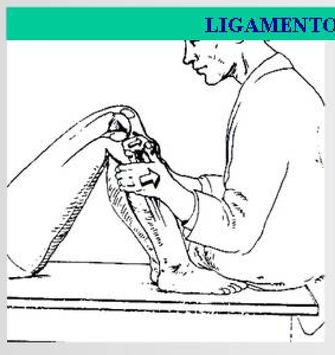
PRUEBAS ESPECIALES

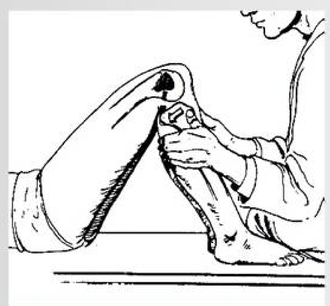
VALGO VARO



Forzar el valgo y el varo para comprobar la estabilidad de los ligamentos laterales

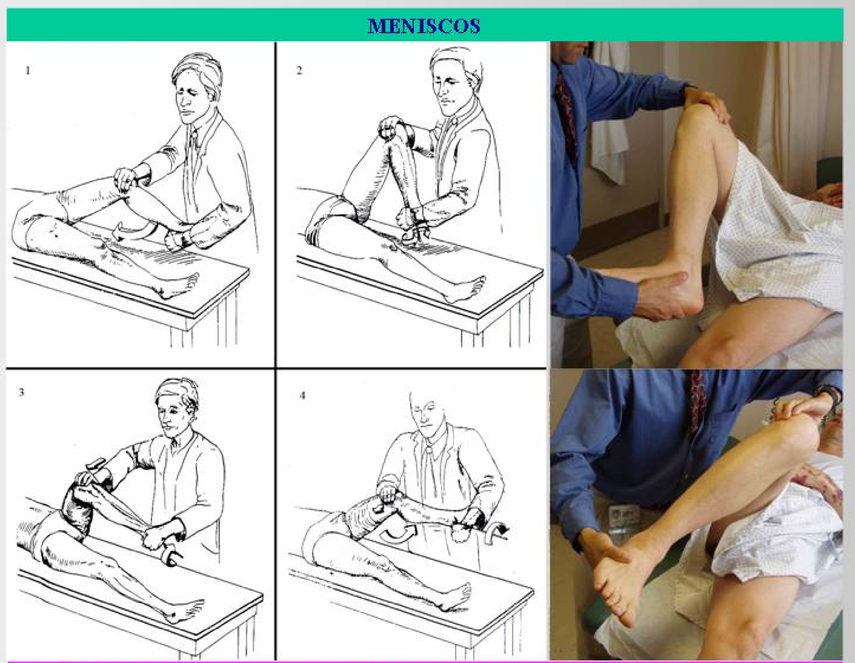
LIGAMENTOS CRUZADOS





Con la rodilla a 90° grados, traccionar de la pantorrilla o empujar de esta para comprobar la estabilidad de los ligamentos cruzados anterior y posterior

MENISCOS



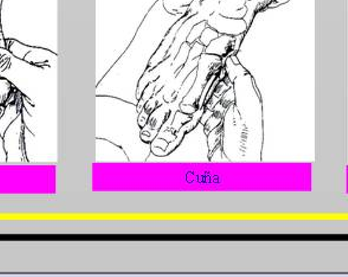
McMurray (lesión de meniscos): ME pierna flexionada, rotación interna máxima, dedos en la interlínea para notar o no un chasquido mientras se extiende la pierna forzando la rotación. MI: igual pero en rotac. externa

TOBILLO Y PIE

INSPECCIÓN

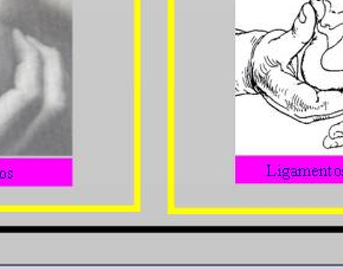
Aspecto de tobillo y maleolos

Cara interna



Cara externa

Dorso del pie



Zona plantar

Dedos y espacios interdigitales

PALPACIÓN

ARTICULACIONES

Tobillo

Bolsa sinovial anterior

Subastragalina

Metatarsofalangicas

Interfalangicas

ESTRUCTURAS

Maleolo Interno

Maleolo Externo

Calcaneo

Cuña

Apófisis Estiloides

Metatarsianos

ESTRUCTURAS

Tendón de Aquiles

Ligamentos Laterales

Zona Plantar Media

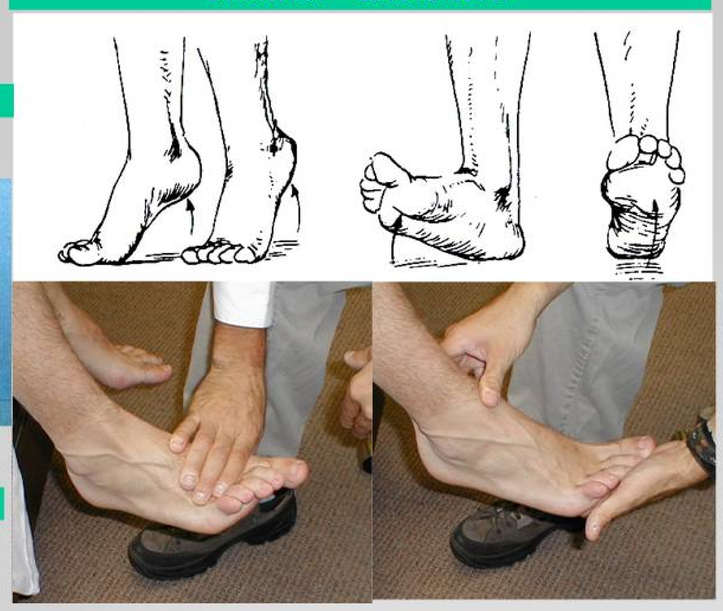
EXPLORACIÓN DE LA EXTREMIDAD INFERIOR (3)

TOBILLO - PIE

MOVILIDAD

FLEXION - EXTENSION

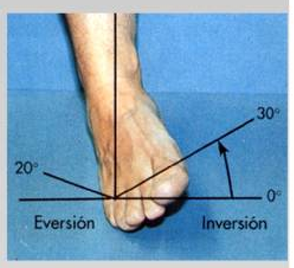
ACTIVA

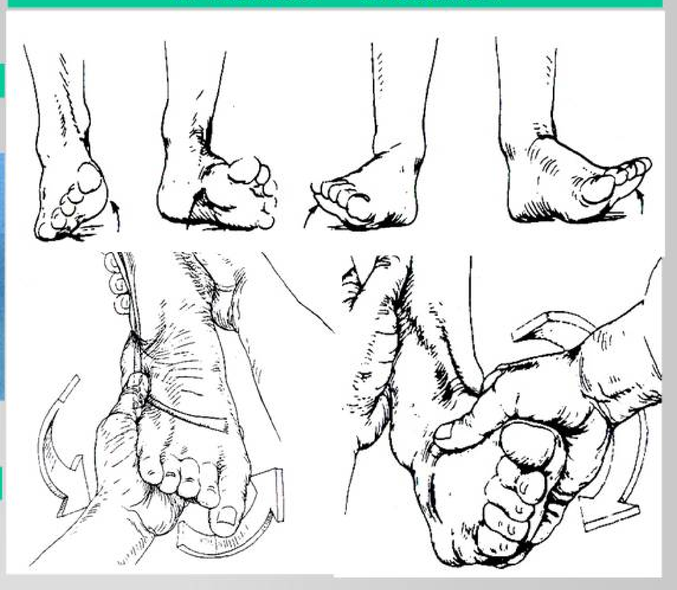


CONTRARESISTENCIA

INVERSION - EVERSION

ACTIVA

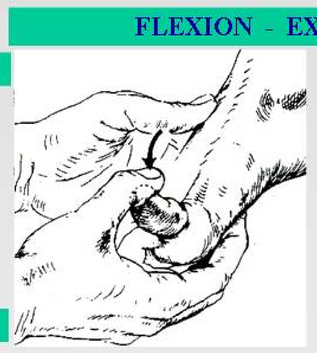




CONTRARESISTENCIA

FLEXION - EXTENSION DEDOS

ACTIVA



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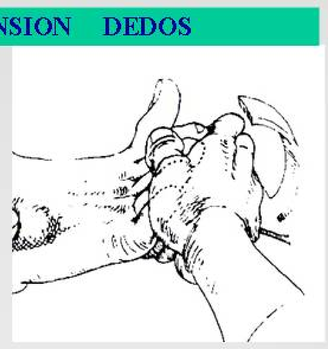
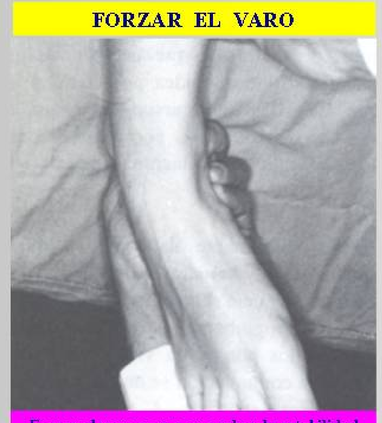


PRUEBAS ESPECIALES

FORZAR EL VARO



Forzar el varo para comprobar la estabilidad del ligamento lateral externo

PRUEBA DEL CAJON ANTERIOR / POSTERIOR

Para comprobar la estabilidad de la articulacion del tobillo

BUSCAR LA PRESENCIA DE EDEMA

Muy importante buscar la presencia de EDEMA y hacerlo siempre, mediante palpación

NEUROLOGICO

REFLEJOS

Rotuliano L2-L4; Aquileo S1; Se Gradua la respuesta: 0 - Ausente; 1 - Mínima pero presente; 2- Normal; 3- Brusca o excesiva; 4- Con clonus. Si el enfermo esta distraido realizando un esfuerzo es mas facil ver los reflejos. Plantar Babinski positivo o patológico dedos presentan extensión.

SENSIBILIDAD SUPERFICIAL

Con un objeto romo en cara externa e interna (posterior)

Igual pero con un objeto puntiagudo

El objeto frio puede ser algo metálico como el fonendoscopio o unas tijeras

SENSIBILIDAD PROPIOCEPTIVA

Con un objeto romo hacer un movimiento lineal (2-4 cms),

Con los ojos cerrados, saber hacia donde movemos la extremidad.

Mediante un diapasón, sobre una prominencia osea

VASCULAR

EN AUSENCIA DE SINTOMAS U OTRAS ENFERMEDADES ES SUFICIENTE CON

FEMORAL

Línea media inguinal, algo por debajo del pliegue inguinal.

TIBIAL POSTERIOR

Por debajo del maleólo interno.

VENOSA

Buscar siempre la presencia de EDEMA y la INSUFICIENCIA VALVULAR

ANTE LA MAS MINIMA ANOMALIA REALIZAR LA EXPLORACION VASCULAR COMPLETA INCLUYENDO PRUEBAS ESPECIALES ARTERIALES Y VENOSAS