This video format is designed to help you prepare for objective structured clinical examinations, or OSCEs.

You are going to observe and participate in the clinical encounter of a 45-year-old patient who comes to the office with a complaint of pain in her left knee. As you observe the encounter, you will be asked to answer questions while the image on the screen freezes. These questions will allow you to practice history taking and physical examination skills as well your clinical reasoning skills in developing an assessment or differential diagnosis, and a plan—that is, an appropriate next diagnostic workup.

You will have time to record your findings and receive feedback.

Health History

Mrs. Garcia, can you tell me your special concerns today.

Sure, yesterday I was playing kickball with my 4th grade students and I suddenly felt this pain in my left knee. It felt like my knee was giving out. It hurts to walk so I decided to come in and see you.

What are your diagnostic considerations at this point?

- Anterior cruciate ligament, or ACL, tear.
- Meniscus tear.
- Collateral ligament tear.

Can you point to the pain?

Yeah, it started here...and it actually still hurts.

And how bad is the pain, on a scale of 1 to 10?

Ooh, right now it’s about an 8.

Do you remember what movement you were doing when the pain first started?

I think I was twisting to make a kick.

And did you hear any popping sound?

I think there was a pop right when the pain started.

What about any swelling?
It started swelling almost right away. My knee just seemed to lock right up. I think the swelling is a little better now, but it still hurts to walk. I’ve been putting my leg up on a chair when I can and putting ice on my knee.

Has it been red or hot?

Not hot, but...a little red, maybe a little warm.

And have you had any fever or chills?

No, not really.

And how about stiffness?

Well, it was stiff when I woke up this morning but I thought maybe that was because of the swelling.

Did you have any pain during the night?

No.

Does climbing stairs make the pain worse?

Yes, actually when I climb the stairs it does seem to feel worse.

Have you ever had any joint problems or injuries in the past?

No, I’ve really been in good health. I jog three times a week and I’ve never had a problem before.

Does anyone in the family have any joint problems or arthritis?

Well, my mom is quite overweight and I know lately her knees have been bothering her. But no other joint problems in the family that I know of.

Let’s go over your medications. What prescribed medicines, herbal or over the counter, do you take?

Right now, I’m just taking ibuprofen, which I started last night. About two tablets every four hours, plus the ice.

Let’s do your physical examination and check out your knee.

Okay, you might have to help me bend my left knee.

I’ll help you throughout the exam.

Okay.

What areas of physical examination are important in this patient?

Bilateral knee examination.

Hip, ankle, and lower leg examination.
Physical Examination

With the patient’s concerns and health history in mind, and after good hand hygiene, you are ready for the physical examination.

Examine the patient’s lungs.
Examine the patient’s heart.

Your lungs are clear and your heart sounds fine. I do not hear any murmurs. Now I would like you to rest both feet on the end of the table, please.

Inspect both knees, observing contours and looking at infrapatellar spaces.

Press lightly into the medial and lateral infrapatellar spaces on both knees.

This video shows the examination of the left knee. You should begin by examining the unaffected right knee, which will not be shown.

There may be a little swelling here…so I am going to check for fluid around your knee, what we call an effusion.

First, I am going to compress here at the suprapatellar bursa, and then press down on your kneecap.
Okay.
Compress 10 cm above the superior border of the patella, well above the pouch, and look for movement of fluid toward the patella.

Compress the soft tissues between the thumb and fingers going down to the sides of the patella and look for fluid.

Then as second test, “ballotte” (or push) the patella sharply against the femur, watching for fluid returning to the suprapatellar pouch.

I’m not finding any fluid on those two tests. You have a bursa here, too, the pes anserine bursa. Do you have any tenderness here when I push?

Palpate over the posteromedial side of the knee, between the medial collateral ligament and the tendons inserting on the medial tibial plateau, distal to the knee over the medial tibia.

Any tenderness here?
No, that seems fine.

To check for any swelling I am going to look for the “bulge sign.” So please keep your leg straight.

Place your hand above the knee, milking any fluid downward. Use your medial fingers and press any fluid toward the lateral side of the knee. Tap the lateral knee just behind the patella and look for a fluid wave on the medial side.
What do you see?

Well, I am not finding any fluid.

In summary, to test for effusions:

Palpate the infrapatellar spaces adjacent to the patella, which are normally “hollow.”

Assess the suprapatellar bursa.

Ballotte, or compress, the patella and listen for normal tap against the femoral condyle.

For minor effusions—check the “bulge” sign.

For major effusions—check the “balloon” sign.

For major effusions, not present here, check the “balloon sign.” Place the thumb and index finger of the right hand on each side of the patella. With the left hand, compress the suprapatellar pouch against the femur, which compresses fluid downward toward the patella. Feel for fluid entering (or “ballooning” into) the spaces next to the patella under your right thumb and index finger. A fluid wave confirms an effusion.

Now I’m going to check what I call the seven structures of the knee.

What are the seven major stabilizing structures of the knee?

The seven major stabilizing structures of the knee are: the medial meniscus, lateral meniscus, anterior cruciate ligament, posterior cruciate ligament, medial collateral ligament, lateral collateral ligament, and patellar tendon.

Note that the cruciate ligaments are in the transverse plane, limiting anterior and posterior movement, or slippage, of the femur on the tibial plateau.

Now I am going to press a little harder to check for tenderness over your medial meniscus and lateral meniscus.

The medial meniscus and lateral meniscus are fibrous discs that act like shock absorbers between your femur and the tibial plateau.

It hurts there, right when you press the inside of my left knee.

I am going to do a test now, called the McMurray test, to check for a tear in your medial meniscus.

Flex the knee in question to a maximum pain-free position, at least 90 degrees. Hold the knee with the right hand in that position with the fingers and thumb over the joint line, then grasp the heel with the left hand and gradually extend the leg while externally rotating the tibia and foot.

I’m feeling a click when I straighten out your leg. Any pain?

Yeah, that hurts.
Rotate the lower leg internally to check the lateral meniscus.

You may have a tear of your medial meniscus. Now I am going to check your medial and lateral collateral ligaments.

Perform the abduction or valgus stress test for the medial collateral ligament, which opens the medial joint line of the knee and stresses the medial collateral ligament.

That hurts on the inside when you push like that.

Perform the adduction or varus stress test for the lateral collateral ligament, which stresses the lateral collateral ligament. Be sure to test the other knee.

That side is okay.

These two ligaments are fine. Now I am going to check for a tear in your anterior cruciate ligament, since you had a twisting injury and heard a popping sound too.

The anterior and posterior cruciate ligaments keep the upper leg, especially the rounded end of the femur, from sliding in and out on the lower leg, mainly the flat plateau of the tibia.

Perform the Lachman test to assess the integrity of the anterior cruciate ligament.

Be sure to repeat the test on the other knee.

It looks like your ACL might be injured on the left. Sometimes your type of injury involves both the ACL and the medial meniscus.

That sounds bad. Will I need surgery?

Possibly, but first I’d like to do a few more tests.

Perform the anterior drawer sign, a second useful test of the anterior cruciate ligament.

So again, everything looks fine on the right. But, on your left it looks like your ACL is injured because the lower leg slides forward a little.

I guess that’s why it hurts to walk.

So please bend your left leg to 90 degrees.

Check the posterior drawer sign for the posterior cruciate ligament.

I don’t see any sag there. The posterior cruciate ligament looks good.

Now assess patellar tenderness and the patellar tendon.

How does it feel when I move your patella?

That doesn’t hurt.
So far it looks like you have a left ACL tear and a possible medial meniscus tear. So now I’m going to examine your hips and ankles to be complete.

Check the internal and external rotation of both hips.

Palpate both calves and ankles for swelling.

Perform flexion and extension of ankles.

Any problems as I check your hips, calves, or ankles?

No, those all seem fine.

**Diagnostic Considerations**

List your diagnostic considerations in order of importance and explain your rationale.

Press pause and list your answers. Resume when you are ready to receive feedback.

The ACL is the primary stabilizer of the knee, limiting displacement of the tibia on the femur during forward movement. This patient reports all three of the classic symptoms: sudden left medial knee pain, give-away weakness, and an audible pop. On examination she has a positive anterior drawer sign and her Lachman test, the most sensitive test for an ACL tear, is also positive. The sensitivity for combined maneuvers testing the ACL is over 80%, and specificity, 94% with a likelihood ratio of 25.0 when testing is positive.

Meniscus tears usually arise from sudden twisting injuries of the knee or from trauma. Swelling and stiffness gradually arise over 2 to 3 days, with pain on the medial side of the knee, especially during squatting. However the patient has more abrupt onset of symptoms and examination findings, but does have tenderness over the medial meniscus, a small effusion, and a positive McMurray test, pointing to a combined ACL and medial meniscus tear. Meniscus tears often accompany ACL tears, as seen in this case.

Patellofemoral pain syndrome is one of the most common causes of knee pain. Patients complain of aching anterior knee pain exacerbated by activities that change the loading mechanics on the patellofemoral joint, like running, kneeling, or prolonged sitting. Usually there is no history of trauma although some may report a direct blow to the patella. Although the syndrome is more common in women, it is unlikely in this patient due to her history of locking and give away of the knee and examination findings pointing to medial ACL and meniscus injuries.

Acute gout presents with monoarticular joint pain, usually in the great toe, the ankle, or the knee, caused by precipitation of monosodium urate crystals in the synovial fluid. Pain often occurs at night when the extremities are cooler. On examination the inflamed joint is warm, swollen, and tender with overlying erythema. Although trauma may precipitate a gout attack, in this patient the diagnosis is unlikely given the onset of acute knee pain from a sudden twisting motion and lack of erythema, warmth, or significant effusion on examination coupled with evidence of joint instability.
Pes anserine bursitis can be confused with meniscal injuries since patients report anteromedial knee pain exacerbated by activities like climbing stairs, which involve flexion and extension of the knee.

However, unlike meniscal injuries, on examination swelling and palpable tenderness are localized below the joint line. Commonly affected patients are obese and have an abnormal gait, knee overuse, or osteoarthritis, which make this diagnosis in this patient unlikely given her acute presentation while playing sports.

**Diagnostic Workup**

List 5 next steps for your diagnostic workup.

Press pause and list your answers. Resume when you are ready to receive feedback.

X-rays are important for ruling out fractures, including avulsion fractures of the femur, tibia, and fibula. They are also helpful for detecting osteoarthritis and joint pathology from gout. (Note that joint aspiration is not indicated since suspicion of gout is low and there is minimal effusion from hemarthrosis or synovial fluid.)

MRI is superior for soft tissue pathology, including ACL tears, meniscal tears, collateral ligament injuries, and effusions.

Rest, ice, compression (with taping), and elevation, known as RICE. These common measures for joint injury reduce soft tissue swelling and pain.

Non-steroidal anti-inflammatory agents. These agents reduce pain and swelling in joint injuries and arthritis when prescribed at scheduled intervals for a specified length of time.

Rehabilitation exercises are therapeutic unless surgery is indicated, which may be the case here. Physical therapy improves muscle strength and range of motion.

**Summary**

In sum, Mrs. Garcia is a 45-year-old teacher with acute left medial knee pain triggered by a twisting movement while playing kickball. She had pain, give-away weakness of the knee, and an audible pop and had to stop playing. The next day there was mild swelling. On examination of the seven stabilizing structures of the knee there was mild swelling, tenderness over the medial joint line, a positive Lachman test and anterior drawer sign for an ACL tear, and a positive McMurray’s test for an associated medial meniscus tear.

Diagnostic considerations include:

ACL tear—most likely.

Medial meniscus tear—also likely. (This commonly accompanies ACL tear.)
Patellofemoral syndrome.

Gout.

Pes anserine bursitis.

The diagnostic workup includes:

X-rays of the knee with AP, lateral, and tunnel views.

MRI of the knee.

Rest, ice, compression, and elevation (RICE).

Non-steroidal anti-inflammatory agents (NSAIDs).

Rehabilitation exercises.