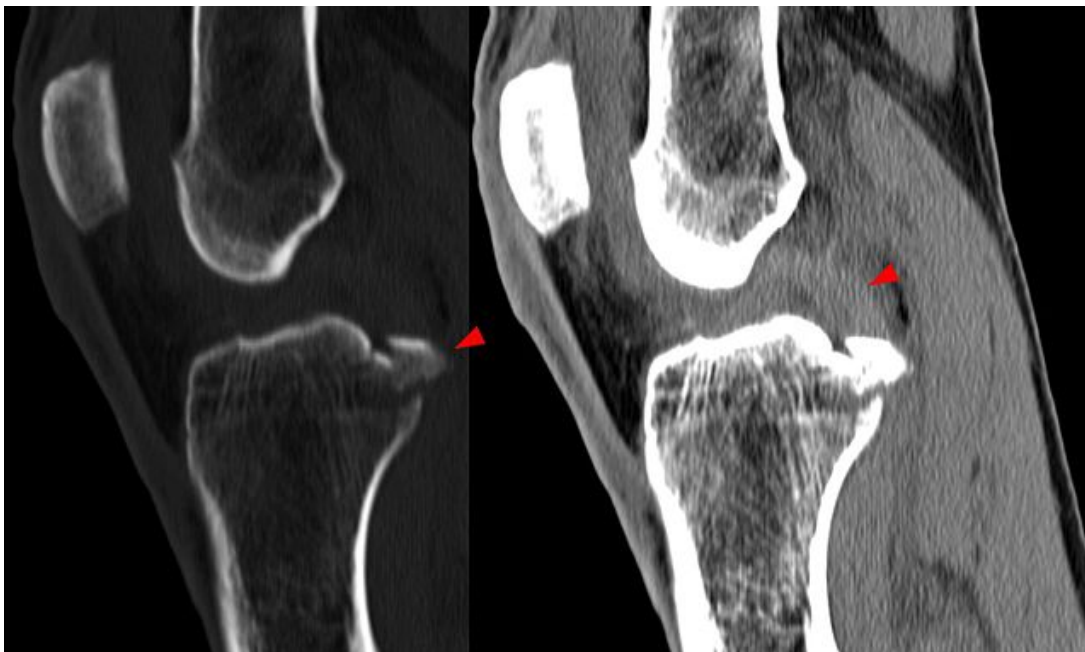


Knee Pain — History Taking and Physical Examination

[See online here](#)

Knee pain is a common encounter in the general practitioner's office. Up to one third of musculoskeletal problems seen in primary care are related to knee pain which can be acute or chronic. Knee pain is more common in active people such as athletes. Half of athletes complain of acute knee pain per year. Trauma, osteoarthritis, rheumatoid arthritis, and gout are the most common causes of acute knee pain.



History Taking from a Patient Complaining of Acute Knee Pain

When a patient presents to the clinic complaining of knee pain, it is essential to characterize the pain. **It is important to know if the pain's onset was rapid or gradual.** The location of pain can also give a clue about the most probable cause. Duration, severity, and quality of pain are also important characteristics that should be explored in history taking.

Acute knee pain can be accompanied by effusion. The timing and amount of the effusion can give important clues to the diagnosis.

Note: Rupture of the anterior cruciate ligament and fractures of the tibial plateau are two common causes of acute knee pain with tense and rapidly accumulating effusion. The

effusion in these two cases is caused by hemarthrosis.

In many cases, the cause of pain is related to a traumatic injury to the knee. The mechanism of injury should be determined as it can give some clues towards the most likely injured knee structure.

Finally, one should inquire about the use of over-the-counter medication or prescribed medication for the control of acute knee pain.

Physical Examination of the Acutely Painful Knee

Examine both knees

It is crucial to examine both knees in the patient. You should always compare the affected side to the other apparently normal side. In the inspection, one should look for signs of acute traumatic injury of the knee. **Bruising and discoloration should be noted.**

Tenderness and palpation

The knee should be palpated. **Tenderness, warmth, and effusions can be assessed with palpation.** Point tenderness is an important part of the musculoskeletal examination of the knee. The patella, tibial tubercle, patellar tendon, quadriceps tendon, and the different joint lines should be checked for point tenderness. The range of motion should also be checked. The knee should be able to extend to zero degrees and flex up to 135 degrees.

Different tests

The suprapatellar pouch should be milked in the patient to exclude the presence of knee effusion. The anterior cruciate ligament should be examined. The anterior drawer test is specific and sensitive for anterior cruciate ligament injuries. The posterior drawer test can be used to assess the integrity of the posterior cruciate ligament.

The **medial collateral ligament can be assessed by the valgus stress test.** The varus stress test, on the other hand, is used to assess the lateral collateral ligament. Injuries to cruciate or collateral ligaments can also present with an acute knee effusion and point-tenderness. The menisci should also be checked in any patient presenting with a crushing injury to the knee.

When to Order an X-ray and What to look for in a Knee X-ray

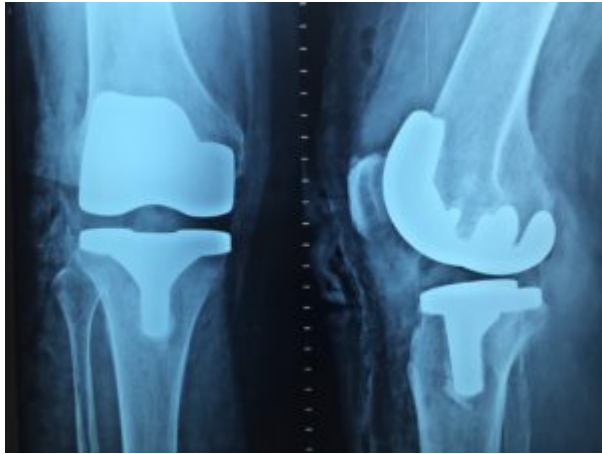


Image: "X-ray Knee" by Andersonvr. License: [CC BY-SA 1.0](https://creativecommons.org/licenses/by-sa/1.0/)

Most cases of acute knee pain are attributed to soft-tissue injuries rather than bony structure injuries; therefore, an **X-ray should be ordered only if you suspect with high certainty a bony injury**. Ottawa knee rules for obtaining radiographs in acute knee injury can be used to determine if the patient should get an X-ray or not. Pittsburgh knee rules can be also used to determine if the patient needs a knee X-ray. The following table summarizes the rules one can use to determine if an X-ray should be ordered for a patient with acute knee pain.

Pittsburgh knee rules	Ottawa knee rules
Blunt trauma or fall injury of the knee:	Acute traumatic knee injury:
Age younger than 12 years, OR	Age > 55 years, OR
Age older than 50 years, OR	Point-tenderness at the head of the fibula, OR
Inability to walk four weight-bearing steps	Point-tenderness of the patella, OR
	Flexion of knee < 90 degrees, OR
	Inability to walk four weight-bearing steps

When an X-ray is performed, one should order three views for the sufficient evaluation of the knee - an **anteroposterior view, a lateral view, and a Merchant's view**. The X-ray is ordered to exclude fracture of the patella, tibial plateau, tibial spines, proximal fibula, and femoral condyles.

Laboratory Tests in a Patient with Acute Knee Pain

Laboratory investigations are rarely needed in the acute setting of a knee injury. Children with an acute knee injury, especially those with hemophilia, should **undergo a complete blood count to exclude anemia**. Patients with inflammatory knee pain, i.e. rheumatoid arthritis or gout, should undergo a complete blood count, erythrocyte sedimentation rate, and uric acid level testing.

Traumatic Knee Injuries and Acute Knee Pain

Anterior cruciate ligament sprain, medial collateral ligament sprain, lateral collateral ligament sprain, and meniscal tears are the most commonly encountered traumatic injuries to the knee. The following table summarizes important characteristics that are specific for each type of injury that can present with acute knee pain.

Condition	Mechanism of Injury	Physical Examination	Radiographic Features
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Anterior Cruciate Ligament Sprain	Non-contact deceleration injury	<ul style="list-style-type: none"> • Severe effusion • Positive anterior drawer test 	<ul style="list-style-type: none"> • X-ray: Possible tibial spine avulsion fracture • MRI: Confirms the diagnosis
Medial Collateral Ligament Sprain	Mis-step with valgus stress	<ul style="list-style-type: none"> • Point-tenderness over a medial joint line • Positive valgus stress test 	<ul style="list-style-type: none"> • MRI: Confirms the diagnosis if a partial or complete tear occurs
Lateral Collateral Ligament Sprain	Varus stress	<ul style="list-style-type: none"> • Point-tenderness over the lateral joint line • Positive varus stress test 	This injury is rare. Imaging is usually not indicated
Meniscal Tears	Sudden twisting injury with or without crushing	<ul style="list-style-type: none"> • Mild knee effusion • Point-tenderness over the joint-line overlying the torn meniscus 	<ul style="list-style-type: none"> • X-ray: Usually negative • MRI: Confirms the diagnosis

Acute Septic Arthritis of the Knee

Acute septic arthritis is more common in diabetics, alcoholic patients, and patients with an impaired immune system. Acquired immunodeficiency syndrome, malignancies, and immunosuppressive therapy are important risk factors for septic arthritis.

A physical examination reveals a warm and tender knee. The range of motion is extremely restricted. The joint is very tender to palpation and joint effusion is a common finding.

Arthrocentesis reveals a white blood cell count higher than 50,000 per mm³.

75% of leukocytes in the effusion are polymorphonuclear cells. Because septic arthritis is caused by a bacterial etiology, protein content is usually elevated, whereas glucose is lowered. Gram stain can reveal the causative pathogen. Erythrocyte sedimentation rate and serum white blood cells are usually elevated.

Gout as a Cause of Acute Knee Pain

The patient presents with acute pain, swelling and erythema of the joint without a previous history of trauma. The joint is tender to palpation and warm. Almost complete loss of range of motion because of exquisite pain.

Arthrocentesis is indicated to exclude septic arthritis and confirm the diagnosis of gout. White blood cells count from the arthrocentesis ranges between 2000 and 75,000 per mm³. **In contrast to septic arthritis, both protein content and glucose are elevated in the effusion** in gout. Polarized-light microscopy is useful in confirming the diagnosis. Negatively birefringent rods are the main finding on polarized-light microscopy of the synovial fluid from an affected knee in gout. Laboratory investigations might reveal hyperuricemia; however, uric acid levels might be normal or even low in an acute gouty attack.

References

[Evaluation of patients presenting with knee pain: Part II. Differential diagnosis](#) via ncbi.nlm.nih.gov

[Evaluation of patients presenting with knee pain: Part I. History, physical examination, radiographs, and laboratory tests](#) via ncbi.nlm.nih.gov

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