

Knee Assessment

Knee pain and discomfort is the most common reason for clinic and emergency department visits. To understand and diagnose injuries, the practitioner must first understand the anatomy and physiology of the knee. Assessment of the knee includes inspection, palpation, range of motion, strength, and a neurovascular assessment.



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Facts

Inspection

Inspect

The practitioner initially assesses the patient's knee if there are any indications of trauma or disease, including localized swelling, deformity, or ecchymosis. Note the alignment of the knees and/or muscular atrophy to the bilateral legs while the patient is seated. Ask the patient to stand and walk and note their gait, posture, and alignment.

Palpation

Paw

While the patient is seated, the practitioner palpates for symmetry, tenderness, and skin temperature. Findings such as boggiess, edema or swelling, and tenderness adding to a good patient history of presenting illness help to determine if advanced imaging is required.

Check Range of Motion

Range of Motion

Active Range of motion (ROM) occurs when the patient performs voluntary movements using their own muscle control, while passive ROM is the same movements performed by the practitioner with no voluntary control or assistance from the patient. If the patient is able to demonstrate full range of motion independently, passive ROM is deferred. Position the patient prone and instruct them to raise their heel to their gluteal fold until resistance is met. Determining the distance between the heel and gluteal fold can be measured in degrees, and a common tool to measure knee ROM is the universal goniometer. For expectedly healthy knee function during this test, a minimum of 90 degrees is required.

Assess Strength

Assess-man and Strong-man

Quadriceps and Hamstring strength is measured by instructing the patient to sit up on the edge of the exam table or in a chair with their knees comfortably apart. Assess strength by resisting the patient's movement of the leg with resistance applied to the proximal tibia during knee extension assesses quadricep strength. Apply resistance to the posterior proximal tibia while the knee is partially extended to assess hamstring strength. It is important for the practitioner to stabilize the knee joint by applying simultaneous pressure with their other hand to ensure the active muscles are isolated. An inability to extend their leg beyond light resistance may indicate an injury to the musculature, such as tendon rupture or muscle tear. During the examination, be sure to watch for signs of pain or discomfort, maintain patient comfort and autonomy, and note unexpected findings.

Neurovascular Assessment

Nerve-and-blood-vessel Assess-man

Detect neurovascular compromise due to a knee injury by palpating the dorsalis pedis and posterior tibial pulses and noting weakness or absence of a pulse. Also, assess skin color, temperature, and the patient's perception of different sensory prompts. Dullness is tested by running a wisp of cotton along each foot, leg, and thigh. Sharpness is tested on the same areas with a splintered cotton tip or blunted disposable safety pin. Have patients close their eyes and report the stimulus felt and the stimulus's perceived location.

Special Tests

Ballottement and Effusion

Balloon-mint and E-fuse fluid

While the patient lies supine with both knees together, compare the size and shape of both knees. Next, "milk the fluid" from all four quadrants to the center of the knee, then firmly press the patella and release. Assess for a spongy feeling between the kneecap and the femur, indicating fluid consolidation. At least 10 to 15 mL of intraarticular fluid may indicate a positive ballottement test for effusion inside the knee. An "unhappy triad" where ballottement is present occurs during a partial injury to the anterior cruciate ligament (ACL), the medial collateral ligament (MCL), and the meniscus simultaneously.

Ligament Integrity

Ligament Integra

To assess ligament integrity, Lachman's test is used to evaluate suspected ACL tears. The test is subject to errors based on the examiner's experience and ability to perform the test accurately. The patient lies supine with the involved knee flexed to 30 degrees, the foot resting on the table surface, and the hamstring relaxed. Start by using one hand to stabilize the distal femur (bottom part of the thigh bone) while using the other hand to grasp the proximal tibia (top of the shin bone). Next, apply anterior force to the tibia as though to sublux the tibia forward while stabilizing the femur. A positive test is instability or pain reproduced with the motion.

Meniscal Integrity

Man-discus Integra

To assess injury to the meniscus, McMurray's test is used. The patient lies supine with their knee in flexion, and the examiner palpates the medial and lateral joints. The examiner provides passive range of motion (flexion, extension, internal/external rotation) while applying varus or valgus pressure to the joint line and noting any popping sensations, pain, or limited movements indicative of a possible meniscal injury.