

## Glossary of Medical Terms:

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### A-C

**ACL:** There are two cruciate ligaments in the knee, the Anterior cruciate ligament (ACL) and the Posterior cruciate ligament (PCL). The ACL originates on the lateral femoral condyle and inserts onto the tibia. The ACL stabilizes the knee by resisting forward motion of the tibia on the femur. In addition, the ACL helps resist inward rotation of the tibia on the femur. The ACL allows twisting and cutting activities to be performed without instability.

When the ACL is injured typically there is a large amount of swelling, pain, and instability associated with this injury. Usually this type of injury requires surgery, an ACL reconstruction.

**POPLITEAL OR BAKER'S CYST:** A fluid-filled cyst is a distended bursa located in the back of the knee. The cyst usually results from an intra-articular problem such as osteoarthritis.

**BONE PATELLAR-TENDON BONE:** When an anterior cruciate ligament is torn surgery is often necessary to stabilize the knee. A bone patellar tendon bone (B-PT-B) graft can be used to reconstruct the torn tendon and stabilization of the knee is restored. The patient's patella tendon, also known as an autograft, can be used as the new ligament graft. Part of the patient's own patella tendon, along with bone at each end of the tendon, is

used as the graft. This is one type of graft that may be used in during reconstruction surgery for a torn cruciate ligament in the knee.

**BURSITIS:** Bursitis is inflammation of a bursa. A bursa is a sac of fluid, typically flat, that prevents friction between tendons and bones. Bursas are found all over the body where movement between muscles and bone occurs. Typically the pain is insidious in onset and gradually intensifies as the activity is continued. Pain and swelling in the area of the bursa can occur.

Common examples of bursitis include:

- Pre-patellar bursitis, also known as 'housemaid' knee. This is common in individuals that spend a lot of time kneeling on their knees.
- Pes anserine bursitis - The pes anserine tendons are the sartorius, gracilis, and semitendinosus tendons. These tendons insert on the tibia. Inflammation of the bursa at the insertion of the tendons below the knee on the inside portion of the tibia results in the bursitis. Pes anserine bursitis occurs in long-distance runners, and sports that involve pivoting, cutting, jumping, and deceleration. Causes include over-use or direct contusion.
- Greater trochanteric bursitis - a bursa located on the upper outer side of the hip. Common complaints are difficulty with walking and sleeping on the affected side because of pain.

**CRUCIATE LIGAMENT:** The cruciate ligaments, anterior cruciate ligament (ACL) and posterior cruciate ligament (PCL) are the two ligaments found in the middle of the knee. These two ligaments connect the femur and the tibia and limit the movement of the tibia either forward or backwards during movement.

ACL stabilizes the knee by resisting forward motion of the tibia on the femur. In addition, the ACL helps resist inward rotation of the tibia on the femur. The ACL allows twisting and cutting activities to be performed without instability.

The PCL ligament stabilizes the knee so that the tibia doesn't move backwards on the femur and

serves to control hyperextension of the knee.

**CRYOTHERAPY:** Cryotherapy is a term used to define the application of cold to reduce pain and inflammation. Many forms of cryotherapy are used including ice, ice-like products, or cold fluid.

## D-G

**DISLOCATION OF THE KNEE:** Dislocation of the knee is an uncommon injury. A dislocation occurs when most or all of the ligaments of the knee are torn resulting in the femur dislocates from the tibia. A knee dislocation is considered a significant and serious injury. During a knee dislocation the blood vessels and nerves behind the knee can be injured resulting in further injury. A dislocation is an emergency and should have immediate medical evaluation.

**DISLOCATION OF THE PATELLA:** The patella (kneecap) articulates in the femoral groove (thigh bone). A dislocation occurs when the patella moves out of the groove that it normally articulates. Typically a patella dislocation occurs lateral (patella flips over the groove to the outer side of the knee) and rarely medially. This injury is most commonly seen in females and young individuals (16-20 years).

A patella dislocation can result from a direct blow to the knee but most often it occurs following a simple twisting injury with a sudden contraction of the quadriceps muscle (thigh muscles). Some individuals are more prone to this type of injury because of an inherent instability of the patella due to a shallow femoral groove (trochlear dysplasia), a high-riding patella (patella alta), very angled lower extremity (increased Q angle or valgus deformity) or excessive joint laxity (for exa. Ehlers Danlos Syndrome).

During a patella dislocation a clunk or tearing sensation may be heard or felt. There is immediate pain and swelling of the knee. The knee may look deformed. A reduction (patella is put back in the femoral groove) of the dislocation is necessary. This injury may also involve fractures of the patella or the femur. A radiograph of the knee is typically performed.

The first time patella dislocator typically is treated conservatively. However, there are specific indications for surgery and an evaluation by a sports medicine physician is recommended. Typically a non-complicated patella dislocation is placed in a knee immobilizer for a short period of time and then a course of physical therapy follows the immobilization. Recurrent dislocations typically require surgery.

**EDEMA:** Edema is an abnormal accumulation of fluid in the soft tissues or organs. There are a number of factors that contribute to the accumulation of the edema including inflammation and lymphatic obstruction (abnormal fluid removal from the tissue). Edema can form in certain organs such as the brain (cerebral), lungs (pulmonary), legs (peripheral), and skin (mosquito bite).

**EFFUSION:** The normal knee produces a small amount of fluid called synovial fluid. This fluid is made to help lubricate the joint. When an excess of fluid is produced it is referred to as an effusion (water on the knee).

An acute knee effusion is an effusion that occurs suddenly such as during an injury or aggravation of underlining arthritis. The ligamentous knee injury can result in significant intra-articular (inside the joint) bleeding resulting in a hemarthrosis (blood in the knee joint).

Some individuals will have a chronic effusion. In other words, they have an effusion all the time. The effusion may or may not be accompanied by pain.

**FABELLA:** A fabella is a small bone within the tendon of the gastrocnemius muscle (calf muscle) that forms at the back of the knee. It is normally seen in 10-20% of individuals.

**FABELLA SYNDROME:** The fabella syndrome, an uncommon problem, is pain noted on the outer back part of the knee when the fabella rubs on the femoral condyle (thigh bone).

Typical treatment of the fabella syndrome is usually conservative and includes anti inflammatories, stretching, and rest.

**FIBULA:**The fibula is a long narrow bone located to the outer side of the tibia (shinbone). The fibula serves as an attachment for a number of muscles and tendons. In addition, the fibula helps form the ankle joint.

**GASTROCNEMIUS MUSCLE:** The muscle originates in the back of the knee in two parts, the medial and lateral heads, these merge together and extend down the back of the tibia and insert as the Achilles tendon at the calcaneus (heel bone)

## H-Q

**HAMSTRINGS:** The hamstrings muscles are the three muscles at the back of the thigh: semitendinosus, semimembranosus, and biceps femoris. The hamstrings muscles attach behind the knee as tendons. The muscles contract to flex (bend) the knee and extend (straighten) the hip.

**HAMSTRINGS GRAFT FOR TORN CRUCIATES:** The semitendinosus and the gracilis tendons can be used (harvested) and used to replace the cruciate ligament.

When a cruciate ligament is torn surgery is often necessary to stabilize the knee. Different grafting techniques have been used to reconstruct the torn tendon and stabilization of the knee is restored. One type of graft, the hamstring graft, involves harvesting (using) the semitendinosus and the gracilis tendons to replace the cruciate ligament. Other options include a bone patellar tendon bone graft (see bone patellar tendon bone graft section) and a cadaver graft.

**HAMSTRINGS INJURY:** Hamstring injuries can occur to the muscle itself (strain or tear) or the tendon portion (tendonitis). Muscle strain or tear can result in pain, swelling, and bleeding into the area. Tendonitis can cause pain behind the knee.

**HAMSTRINGS STRETCH:** A hamstrings stretch is a stretch of muscles on the back of the thigh. These muscles, known as the 'hamstrings', are made up of three muscles: the semitendinosus, semimembranosus, and the biceps femoris. The hamstrings muscles originate at the ischial tuberosity (buttock area on the pelvis bone) and attach behind the knee as tendons. The muscles contract to flex (bend) the knee and extend (straighten) the hip.

Hamstrings stretches are an important part of back, hip, and knee rehabilitation and should be incorporated into a comprehensive fitness program to prevent injuries.

**INFLAMMATION:** Inflammation is the complex biological response of the body to harmful stimuli. The stimuli can be defined as an irritant, a pathogen, or injury to cells. Inflammation is a protective process to rid the injurious source and initiate the tissue healing process. Clinically, inflammation can result in localized pain, redness, warmth and swelling.

**INFRAPATELLAR BURSTITIS:** The infrapatellar bursa is made up of two bursas, the superficial and the deep, and they are located below the patella (knee cap). Infrapatella bursitis is an inflammation of this bursa.

A bursa is a sac of fluid, typically flat, that prevents friction between tendons and bones. Bursas are found all over the body where movement between muscles and bone occurs. Typically the pain is insidious in onset and gradually intensifies as the activity is continued. Pain and swelling in the area of the bursa can occur.

**ILIOTIBIAL BAND FRICTION SYNDROME OR IT BAND:** The iliotibial band (ITB) is a band of tissue that starts at the top of the hip bone and extends down along the outside of the thigh crossing over the outside of the knee and attaching on the proximal lateral tibia. As your knee moves from extension (straight) to flexion (bending) the band crosses a prominence of the femur (condyle).

Iliotibial band friction syndrome (ITBS) is an overuse injury results by excessive friction between the ITB and the lateral femoral condyle. Pain can also occur at the origin, insertion, or the lateral hip region. ITBS is commonly seen in runners, cyclists, walkers, and athletes with repetitive knee movement.

**JOINT:** A joint connects bones together so that the bones can move in relation to each other. Most joints involve two bones but the knee is an example where three bones (femur, patella, and tibia) work together to allow motion. These bones form the tibiofemoral joint where the tibia articulates with the femur and the patellofemoral joint where the patella articulates with the femur.

**JOINT CARTILAGE:** Articular cartilage or joint cartilage is the covering of the bone surfaces in a joint. The breakdown of this cartilage results in the underlying bone exposure and osteoarthritis.

**JUMPER'S KNEE:** Jumper's knee is an inflammation of the quadriceps tendon at its insertion into the top edge of the patella (knee cap). Jumper's knee is often triggered by overuse and repetitive overload of the tissues seen in jumping and landing sports.

## K-M

**KNEE CARTILAGE:** The term 'knee cartilage' can refer to the menisci or the articular cartilage. The menisci, the middle and lateral meniscus, are two pieces of cartilage that are located between the femur and the tibia. The meniscus provides shock absorption between the bones.

The meniscus provides shock absorption between the bones. The articular cartilage is the cartilage that covers the bone surfaces.

**KNEE PAIN:** Knee pain is pain felt in the knee. Pain may be experienced at a localized point in the knee or may be vague and generalized to the entire joint. Some conditions, such as hip or back pathology, can radiate pain to the knee. The pain is felt in the knee despite the fact that the knee is not the source of the pain. Pain that is experienced at a specific point can provide the source of the pain.

A thorough exam is essentially to provide the correction location of the pain so that proper treatment can be rendered. The physical exam should include the range of motion of the joint, palpation of specific areas (joint lines, tendons, bursae, bones), evaluation of the ligaments stability, and specific tests that evaluate for meniscal tears and patellofemoral pain for the source of the pain are done.

**LATERAL COLLATERAL LIGAMENT:** The lateral collateral ligament (LCL) is the ligament on lateral aspect of knee that extends from the lateral femoral condyle to the fibular head. This ligament helps stabilize the knee from not bending abnormally inward (bow-legged). Sprain or tear of lateral ligament produces pain and swelling. This is the least commonly injured knee ligament. This ligament is injured when a varus stress (hit on the inside of knee) or twisting injury occurs to the knee. Isolated injury to this ligament is uncommon.

**LATERAL MENISCUS:** Anatomy: The menisci are two crescent-shaped wedges (medial and lateral) of fibrocartilage between the femur (femoral condyles) and the tibia. The menisci increase stability and congruity of the knee.

An injury to either the medial or lateral meniscus of the knee most commonly happens following a twisting injury. Sudden onset of pain following the injury and is usually localized to the joint line and is accompanied by swelling. Some individuals will also note catching or a locking sensation.

**LIGAMENT:** A ligament is a short band of fibrous tissue that connects bones to other bones. Ligaments provide support to the joint by limiting or preventing movement.

If a ligament injury occurs instability of the joint may be compromised. Not all ligament injuries require surgery.

**MEDIAL COLLATERAL LIGAMENT:** The medial collateral ligament (MCL) extends from the femur (medial

femoral epicondyle) to the proximal medial tibia. This ligament provides stability to the inner surface of the knee not allowing excess opening between the femur and the tibia (valgus).

MCL sprain occurs when either a direct blow to the outside of the knee or twisting maneuver the forces the knee to move inward (knock-kneed). Pain is located in the inside area of the knee and bending and twisting of the knee is painful.

The MCL is the most commonly injured knee ligament. Repetitive overload of the tissues seen in jumping and landing sports.

**MENISCUS:** The menisci are two crescent-shaped wedges (medial and lateral) of fibrocartilage between the femur (femoral condyles) and the tibia. The menisci increase stability and congruity of the knee.

An injury to either the medial or lateral meniscus of the knee most commonly happens following a twisting injury. Sudden onset of pain following the injury and is usually localized to the joint line and is accompanied by swelling. Some individuals will also note catching or a locking sensation.

**MEDIOPATELLAR PLICA:** A mediopatellar plica is a band of synovium (joint lining) inside the knee. Many individuals do not have a plica. If one is found it is typically located on the medial (inside next to the kneecap) side of the knee. It can be felt as a band of tissue. Most plicas are found incidentally on exam and do not cause pain. However, some plicas can become painful and may require surgical excision (removal).

**MICROFRACTURE:** Microfracture is an arthroscopic surgical procedure where a tiny 'pick' is used to punch holes into damaged joint articular cartilage. The procedure causes localized bleeding resulting in a blood clot forming over the affected area. A fibrocartilage forms over the damaged area typically providing pain resolution and return to normal function of the joint. The fibrocartilage is not as durable as the original articular cartilage.

## N-Q

**NEUROMA:** A neuroma is a tumor derived from nervous tissue (nerve cells and nerve fibers). There are a variety of ways that a neuroma can form. A traumatic neuroma is seen after nerve

injury. This can occur after surgery or with direct trauma. It occurs at the end of the injured nerve fiber typically near a scar. They are often painful in the nerve distribution and cause discomfort when touched. Taping on the area may also reproduce the sensation.

Morton's neuroma is an example of a common neuroma that occurs between the toes (typically the base of the 2nd and 3rd, also known as the third intermetatarsal space). It is caused by chronic compression of the digital nerve between the metatarsal bones. The compression results in a neuroma forming causing pain and numbness in the affected toes. This disorder is common in women who wear narrow and/or high-heeled shoes.

**ORTHOPAEDIC:** Orthopaedics is the branch of medicine that treats disorders of the muscle, bones, and joints.

**OSSICLE:** An ossicle is any small bone. Ossicles are found in many places within the body, for example, the human ear, hands, knee, and feet.

**PATELLA:** The patella is also known as the kneecap. The patella is the bone found over the anterior (front) part of the knee. The patella is a sesamoid bone that is embedded in the quadriceps tendon. The patella glides within the trochlea of the femur (thigh bone) with knee extension (straightening) and flexion (bending).

**PATELLA ALTA:** In patella alta refers to the position of the kneecap in relation to the femur (thigh bone). When the kneecap rides higher than its normal position it is referred to as patella alta.

**PATELLA INFERA:** In patella infera (baja) refers to the position of the kneecap in relation to the femur (thigh bone). When the kneecap rides lower than its normal position it is referred to as patella infera.

**PATELLOFEMORAL PAIN:** Pain located in the front of the knee, around the knee cap area, often worse with ascending or descending stairs, incline walking, or prolonged sitting. It is not uncommon to have both knees affected.

May occur as an overuse injury with extreme and/or repetitive loading of patellofemoral joint (e.g. knee bending, running, jumping).

**PATELLA TENDON:** The patella tendon is a thick structure that connects the quadriceps to the tibia.

**PATELLAR TENDINITIS:** Inflammation of the patella tendon can occur just below the knee, along the course of the tendon, or at its attachment to the tibia.

**POSTERIOR CRUCIATE LIGAMENT:** There are two cruciate ligaments in the knee, the Anterior cruciate ligament (ACL) and the Posterior cruciate ligament (PCL). The PCL originates on the femur (medial femoral condyle) and inserts on the tibia. This ligament stabilizes the knee so that the tibia doesn't move backwards on the femur and serves to control hyperextension of the knee.

Pain and swelling in the knee, may experience instability with twisting or walking down inclines. Typically the PCL does not require reconstruction unless there is continued instability despite rehabilitation.

**QUADRICEPS TENDON:** The quadriceps tendon is a thick structure that attaches the quadriceps muscle to the patella.

**QUADRICEPS TENDINITIS (JUMPER'S KNEE):** Quadriceps tendonitis is an inflammation of the quadriceps tendon at its insertion into the top edge of the patella (knee cap). Jumper's knee is often triggered by overuse and repetitive overload of the tissues seen in jumping and landing sports. A fibrocartilage forms over the damaged area typically providing pain resolution and return to normal function of the joint. The fibrocartilage is not as durable as the original articular cartilage.

## R-Z

**A RANGE OF MOTION:** Range of motion refers to the normal expected motion of a joint. There is a recognized expected range of motion of each joint in the human body. Some joints only flex and extend, while others flex, extend, and rotate. The knee, for example, can typically extend (straighten) fully (zero degrees) and flex (bend) to 135-145 degrees of motion. Individual differences are taken into account when the knee is examined by a health care provider.

**SEMI-LUNAR CARTILAGE:** Semi-lunar cartilage refers to the shape of the meniscus (see definition) of the knee. A semi-lunar cartilage is described as a half moon as refers to the appearance of the meniscus. Each knee has a medial and lateral meniscus and both have a similar shape.

**SQUATS:** Squats are a type of exercise that requires bending at the knees while keeping the back upright.

**SUPRAPATELLAR:** Suprapatellar refers to the position just above the patella (kneecap).

**SUPRAPATELLAR BURSA:** A bursa that is located just above the patella (kneecap).

**SUPRAPATELLAR PLICA:** A plica is a thin fibrous tissue that is an extension of the synovial capsule of the knee. Plicas can form anywhere in the knee but are typically found on the medial (inside) of the knee. A suprapatellar plica refers to a plica located above the patella (kneecap). Most individuals are not even aware of the plica. The plica may become inflamed and thicken resulting in a catching, pinching, and pain.

**SUPRAPATELLAR POUCH:** The suprapatellar pouch is the area of the knee joint cavity above the patella.

**SYNOVITIS:** Synovitis refers to the inflammation of the joint lining (synovium). This condition is usually painful and swelling of the joint typically occurs in this condition.

**SYNOVIUM:** The synovium is a thin membrane that is the lining of the joint capsule. The synovium produces and secretes joint fluid (synovial fluid) that provides lubrication and nutrients to the joint.

**TENDINITIS:** Tendonitis is an acute inflammation of a tendon.

**TENDON:** A tendon is a thick fibrous end of a muscle that connects a muscle to a bone.

**TOTAL KNEE ARTHROPLASTY = TOTAL KNEE REPLACEMENT:** A total knee arthroplasty is a common procedure done to replace the femoral and tibial surfaces of the knee joint with metal and plastic. The patella under service can also be replaced. This procedure is indicated in severe end-stage arthritis.

**VALGUS:** Valgus refers to the alignment of an extremity or joint. A knee that has a valgus deformity has a knock-kneed appearance. A valgus force is a force which pushes the knee into a knocked kneed position. A typical injury resulting from a valgus force to the knee results in a medial collateral injury (MCL see above).

**WATER ON THE KNEE:** The normal knee produces a small amount of fluid called synovial fluid. This fluid is made to help lubricate the joint. When an excess of fluid is produced it is referred to as an effusion (water on the knee).

An acute knee effusion is an effusion that occurs suddenly such as during an injury or aggravation of underlying arthritis. The ligamentous knee injury can result in significant intra-articular (inside the joint) bleeding resulting in a hemarthrosis (blood in the knee joint).

Some individuals will have a chronic effusion. In other words, they have an effusion all the time. The effusion may or may not be accompanied by pain.

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