

# What You Need to Know About Knee Bracing



VANDERBILT  UNIVERSITY  
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# Knee Bracing Purpose

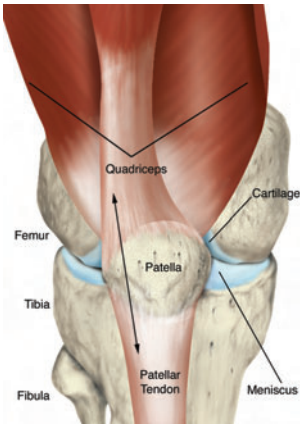
There are many purposes of bracing a knee and they vary as widely as the designs of the braces themselves. In general, braces are used for comfort, support, protection, and/or injury prevention. The design of a brace depends upon the function that it will serve.

Some braces are simply a sleeve designed to slide over the knee to help keep it warm with activity. Other braces are designed to keep the kneecap gliding smoothly over the end of the thigh bone. Others are used in patients who may have a deficient ligament in their knee and the brace provides support to protect the knee in activity that may be impossible without that brace.

It is important to consult a physician, physical therapist, or certified athletic trainer when choosing a particular brace to make sure it fits your needs. An improperly fitted brace can cause discomfort or cause further injury to your knee. Therefore, it is important to understand how to put it on correctly and ask any questions you have about the brace. Your physician, physical therapist, or certified athletic trainers will be happy to answer any questions concerning your brace, as well as discuss your bracing options.



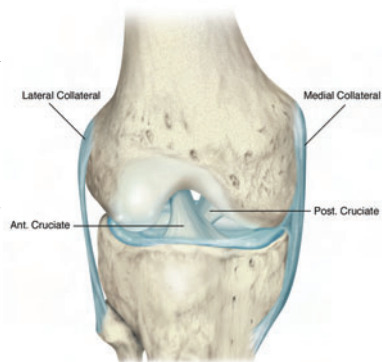
# Knee Anatomy



The knee joint is comprised of three bones, two oval discs of cartilage called menisci, four primary stabilizing ligaments, and various musculature. Principally acting as a hinged joint, the top bone (femur) interacts or articulates with the bottom bone (tibia). The menisci, located between the femur bone and the tibia bone aid in shock absorption and stability in certain positions. Your kneecap (patella) glides over the femur.

The four primary ligaments in the knee are as follows: lateral collateral, medial collateral, posterior cruciate, and anterior cruciate. The lateral collateral ligament (LCL) is located along the outer aspect of the knee and prevents the knee from shifting outward. The medial collateral ligament (MCL) is located along the inner aspect of the knee and prevents the knee from shifting inward towards the opposite knee. The anterior cruciate ligament (ACL) and posterior cruciate ligament (PCL) are located internally within the knee joint and act as stabilizers in that they prevent the knee joint from moving excessively forward (anterior) or backward (posterior).

The primary muscles that cross the joint are the quadriceps, located on the front of the knee, and the hamstrings, which run down the back of the knee. These muscles work together to move the knee forward and backward, allowing one to be functional.



# Common Knee Injuries

**Ligament Sprains:** When a ligament is sprained in the knee, instability may occur. The amount of instability is governed by the degree of sprain, and which ligament is sprained. The unstable knee will often show signs of sharp pain with certain movements, a dull ache when stationary, giving way with walking, limited range of motion, and swelling.

**Patellar Tendonitis:** Patellar tendonitis, or “Jumper’s Knee,” is defined as an inflammation of the patellar tendon, located on the bottom of the patella, running to your shin bone (tibia). This condition results from overuse, a sudden increase in exercise intensity, or tight quadriceps musculature. Symptoms include sharp pain on the tendon when touched, pain at the beginning and end of exercise, but not necessarily in the middle.

**Patellofemoral Pain:** Patellofemoral pain is described as pain at the front of the knee, radiating from around the patella. The sensation can be described as an achiness with no activity, or sharp pain when exercising. Pushing off of your leg, such as jumping or going up stairs, can duplicate the symptoms. This pain has many causes, such as muscle imbalances, lack of flexibility, and misalignment of the patella as it travels over the femur.

**Patella Dislocation:** Front-sided knee pain may result when the kneecap partly comes out of the groove (subluxation), or completely comes out (dislocation). This can stretch the supporting soft tissue that normally holds the patella in place, which may lead to reinjury. This can be caused by muscle strength imbalances, oddly shaped patella(s), or a shallow groove on the end of the thigh bone (femur).

**Osteoarthritis:** Osteoarthritis is a chronic joint disease characterized by a deterioration of the ends of the bones that make up the knee joint. Signs and symptoms include swelling, stiffness, and a deep achiness or pain in the knee. Often, this condition can be attributed to prior injury, obesity, or being bow-legged or knock-kneed.

# Types of Knee Braces

1. Prophylactic (Knee Sleeve, Patellofemoral, Hinged)
2. Rehabilitative
3. Functional (Hinged, off-the-shelf, custom)
4. Unloader/Offloader (off-the-shelf, custom)

A **knee sleeve** may be used to increase general warmth to the area, provide compression, and enhance balance. It is a soft fabric (neoprene), slip-on device generally used for knee pain. If used with a raised pad (either circular, C-shaped or J-shaped), it may be effective in treating patellofemoral joint conditions such as patella subluxation, patella dislocation, and abnormal patellofemoral tracking. It does not support any of the knee's ligamentous structures.



Knee Sleeve

A **prophylactic knee brace** is used to protect or decrease the severity of injury to the outside ligaments of the knee from impact and forces applied (medial and lateral collateral ligaments). The brace has rigid bars on one side, or both sides, hinges, and nonelastic straps.



Prophylactic Brace

A **rehabilitative brace** is used to protect injured ligaments and control range of motion of the knee after acute injury or surgery. It has full-length bars on both sides of the knee, with hinges that are adjusted to control the range of motion. The bars are contained in a foam liner, which is applied to the leg with nonelastic straps.



Rehabilitative Brace

## Types of Knee Braces - cont.

A **functional brace** is used to provide stability and/or protection for the anterior cruciate ligament and other knee ligaments after repairs, reconstructions, or injury. The brace is made of rigid composite bars designed to limit hyperextension. It can be either custom made or off-the-shelf.



Functional Brace

An **unloader/offloader brace** is used to provide pain relief in osteoarthritis (OA) of the knee. The brace is made of a metal or plastic composite and hinges similar to that of a functional knee brace. It reduces pressure in the degenerative area by redirecting forces to another area of the knee, reducing pain and improving knee function.



Unloader Brace

### Sources:

American Academy of Orthopaedic Surgeons (AAOS). The use of knee braces [position statement]. Rosemont, IL:AAOS; 1997 Oct. Revised 2003 Dec. Available at URL address: <http://www.aaos.org/wordhtml/papers/position/1124.htm>

American Academy of Pediatrics Committee on Sports Medicine. Knee brace use in the young athlete. *Pediatrics*. 2001 Aug; 108(2): 503-7

# Knee Bracing Tips

## ADVANTAGES OF BRACING:

- Support
- Stability
- Pain relief
- Prevention of re-injury

## WEARING YOUR BRACE:

- Make sure it fits - No gapping, pinching, slipping
- Align kneecap in the center of the cutout if applicable
- Use straps and/or buttresses to stabilize kneecap and ensure a good fit
- When wearing, straps should be tightened to moderate tension
- Regularly tighten straps, tape or hook-and-pile fasteners to prevent unwanted brace movement
- All straps and pads may be trimmed or adjusted for individual comfort
- Move your leg around and double check fit and comfort prior to activity
- If your brace is not comfortable or you are experiencing problems contact your physical therapist or athletic trainer.

## CARING FOR YOUR BRACE:

- Check regularly for holes, cracks and excessive wear-and-tear, replace any broken or damaged pieces
- Hand wash Neoprene, liners, pads and straps in cold water and mild detergent and air dry
- Braces can be used in fresh and salt water but must be rinsed with fresh, clean water and air dried



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