KNEE ANATOMY OVERVIEW

The knee is a joint that connects the femur (thigh bone) and tibia (shin bone). The fibula is a small bone that runs parallel to the tibia down to the ankle. The patella, or kneecap (not shown), protects important structures deep inside the knee.

Front View of Knee

There are many other structures in the knee joint. The structures shown above are the most commonly injured requiring medical treatment.

- High tibial osteotomy
- Articular cartilage
- Anterior cruciate ligament
- Posterior cruciate ligament
- Meniscus repair
- Meniscus transplant

MUSCLES: The quadriceps musculature is comprised of four muscles (rectus femoris, vastus lateralis, vastus medialis, vastus intermedius) on the front of the thigh that help extend (straighten) the knee. The sartorius muscle (not shown) flexes, abducts and externally rotates the thigh. The hamstrings musculature (not shown) is comprised of three muscles (semimembranosus, semitendinosus, biceps
femoris) on the back of the thigh and help flex (bend) the knee.

**ARTICULAR CARTILAGE:** Articular cartilage is located on the undersurface of the patella and on the ends of the femur (femoral condyle) and tibia (tibial plateau). This cartilage helps the knee move smoothly. When articular cartilage is damaged, the condition is referred to as osteoarthritis. There are many different surgical treatments for osteoarthritis, including high tibial osteotomy for knees that are bowed, and cartilage regeneration techniques such as osteochondral autograft transfer (OAT) or Carticel (autologous chondrocyte implantation).

**LIGAMENTS:** Ligaments connect bones and help keep the knee stable. The anterior cruciate ligament, posterior cruciate ligament, and medial collateral ligament all connect the femur and tibia together. The lateral collateral ligament connects the femur and fibula. Each ligament has specific functions in the knee. For instance, the anterior cruciate ligament helps prevent the tibia from coming too far forward. Patients who tear this ligament often have unstable knees that can collapse, causing falls. There are reconstruction options for complete ruptures to the anterior cruciate ligament, posterior cruciate ligament, and lateral collateral ligament.

**MENISCUS:** The medial meniscus and lateral meniscus act as shock absorbers between the femur and tibia and also help keep the knee stable. When these structures are torn, they can often be repaired to prevent future arthritis. When a meniscus has been completely removed, a meniscus transplant (allograft) can be implanted in some individuals.

*Source: Sportsmetrics USA – [www.sportsmetrics.net](http://www.sportsmetrics.net), used with permission.*