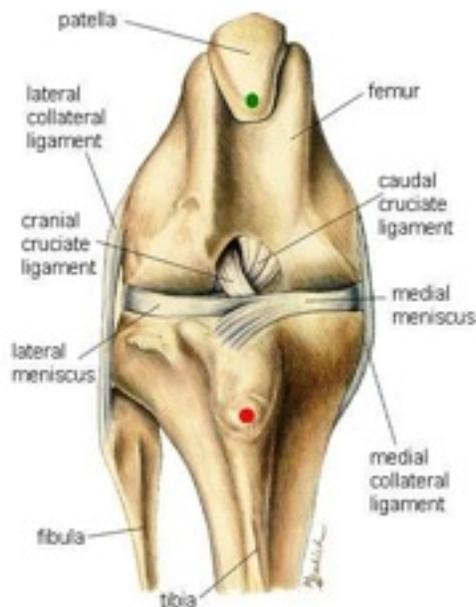


Injury in the Knee (stifle)

The most common knee injury in the dog is rupture of the Cranial Cruciate Ligament (CCL), also frequently called the Anterior Cruciate Ligament (ACL). This injury can occur at any age and in any breed, but most frequently occurs in middle aged, overweight, medium to large breed dogs. This ligament frequently can suffer a partial tear, leading to slight instability of the knee. If this damage goes untreated, it most commonly leads to complete rupture and possibly damage to the medial meniscus of the knee. The meniscus acts as a cushion in the knee. Complete rupture results in front-to-back instability, commonly called Tibial Thrust, and internal rotation of the lower leg, commonly called Pivot Shift. Untreated legs usually become very arthritic and painful from the instability.

An injured Cruciate Ligament can only be corrected by surgery. There are numerous surgical corrections currently being performed. The most common are 1) External Capsular Repair, 2) Tibial Plateau Leveling Operation (TPLO), and 3) Tibial Tuberosity Advancement (TTA). This article will focus on the TTA, which is the newest procedure, and probably the best repair for most dogs. The forces within the knee are very complicated and change as the knee is rotated through its range of motion. In a normal standing position there is a tendency for the lower end of the Femur to slide backwards on the tilted Tibial Plateau, this is called Tibial Thrust. This force can be corrected by either cutting the Tibial Plateau and rotating it into a more flat position (TPLO) or by counteracting this force by changing the angle of pull of the very strong Patellar Tendon by advancing the Tibial Tuberosity (TTA). It has been shown that the TPLO procedure can still allow rotational instability (Pivot Shift) and this may lead to the progression of arthritis as the dog ages. This Pivot Shift does not seem to be a problem with the TTA procedure because

it results in more control of rotation by the large quadriceps muscle which pulls on the Patellar Tendon. The difference in the physics have been worked out quite well by the researchers. Anyone interested in the details can easily find them by doing an internet search on "TTA vs. TPLO".



The Normal Knee

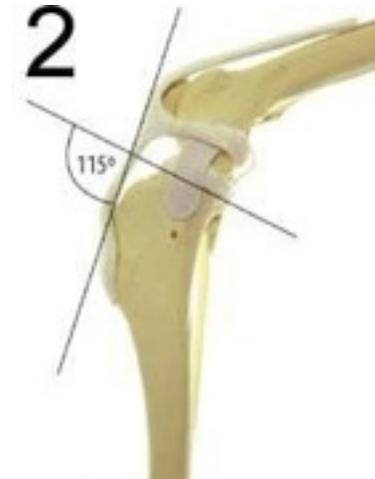
The normal Knee Joint (also known as the Stifle joint), has multiple structures which are important to its function. This drawing shows a view from the front with the muscles removed. It is important to note that the Patellar Tendon, a vital structure in the joint has been removed, so that you can see "behind" it. The Patellar Tendon is a thick, tough band that runs from the Patella (green dot) to the Tibial Tuberosity (red dot).

The Surgery

The normal joint, viewed from the side, shows the upper bone, the femur and the lower bone, the tibia. The Tibial Plateau is the actual point of contact between the femur and the tibia. In this diagram the Patellar Tendon is clearly visible. It is this structure that must offset the abnormal forces that are created with a rupture of the cranial cruciate ligament.

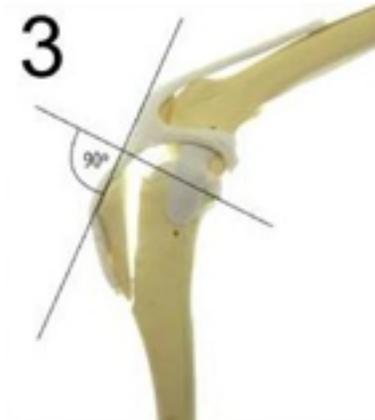
Typical Patellar Angle

In the typical joint, the angle formed between the Tibial Plateau and the Patellar Tendon is about 115 degrees when the leg is in a normal standing position.



Corrected The Patellar Ligament Angle

The abnormal motion that occurs in a knee with a torn cruciate ligament is called Tibial Thrust. After the TTA Surgery, the corrected angle is now 90 degrees, which will offset the forces in the knee that tend to make it unstable.



Surgical Appearance

This diagram shows the knee once it has been stabilized with the appropriate Titanium implants. These implants are very lightweight and are designed to stay in permanently.

