THUNDER BAY
Veterinary Hospital

# Cruciate Injury

## What does this mean?
## How is it diagnosed?
## How can it be corrected?

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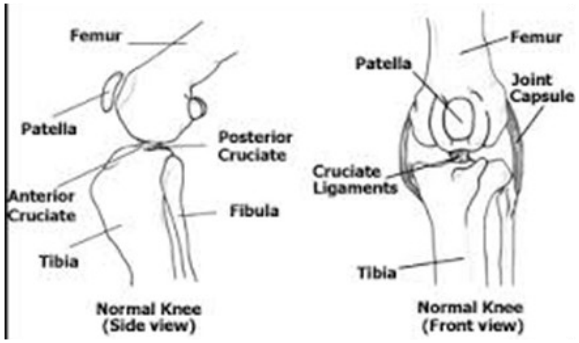
## What is cruciate injury?

The most common reason why dogs will limp on a hind leg is from damage to the stability mechanism of the knee, know as the cranial (anterior) cruciate ligament (CCL). In most cases, injury to this mechanism is not due to a sudden dramatic trauma, but to slow deterioration that breaks with only a minor trauma or no trauma at all. A healthy cruciate ligament can withstand a tumble or fall, but an unhealthy one is at a much greater risk of breaking.




When a dog walks, the natural distribution of forces causes the tibia (shin) to want to move forward and upward in relation to the femur (thigh). The cranial cruciate ligament keeps these forces in check to prevent too much upward and outward motion. When torn or stretched, too much play is in the knee joint and the structures begin to chafe causing inflammation and pain which in time develops into bone deposits and bone erosion (degenerative arthritis).

It is important to know that once injured, **the cruciate ligament can NEVER heal** and the body attacks it like a foreign object within the joint.

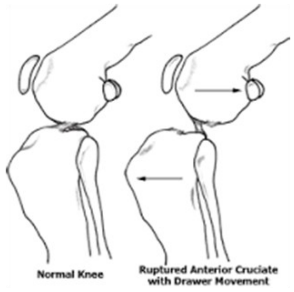
## How is it diagnosed?

The most common symptom of dogs with CCL is suddenly occurring lameness of one hind leg. The dog may have been playing in the yard or with other dogs and suddenly will not bear weight or only toe touch on one hind leg. The dog usually goes 3 legged for several days, then gradually seems to improve only to be lame again with exercise. Dogs may also have a characteristic sitting stance that takes pressure off the knee. Dogs often tend to "forget" they are lame when things like squirrel or ball chasing is at hand, then "remember " their leg hurts when walking at a slower pace. It is most commonly seen in young to middle aged, medium to large/giant breed dogs, but it can occur in dogs of all ages and breeds.

When the veterinarian examines the lame leg, they can often feel swelling within the joint capsule and when pressing on certain structures within the joint, get a reaction of discomfort to outright pain.

If the injury has been ongoing for some time, they may actually be able to feel the development of arthritis in the joint. There may even be a clicking sound when the knee is flexed and extended. The click is the cartilage caught and then released by the abnormal bone movements. The doctor may be able to thrust the tibia forward by manipulating the joint but often in the awake animal this can be difficult to evaluate.

Radiographs (x-rays) are then taken with the patient sedated. It is common to take a view of the hips as well as views of the knee. Some dogs will have concurrent hip problems and it is best to diagnose these to give an accurate prognosis for the patient. The cruciate ligament does not appear on radiographs but there is often collaborating evidence of its failure of function such as joint effusion and a forward thrusting of the tibia in relation to the femur. The radiograph also helps to determine that the problem is not due to a fracture, tumor or other abnormality. Information gathered from X-rays can also be used to plan for a surgical repair.




# How is it corrected?

The best time to correct a cruciate injury is as soon as possible after it occurs. Once arthritic changes develop in the joint, they do not go away. The goal of stabilizing the joint is to minimize or arrest the development of arthritis and give the dog a stable joint that they can use normally.

Stabilization requires surgery since the ligament cannot heal on its own. Stabilization surgeries can be grouped into one of two types. The first aims to reduce the movement of the joint, with either implants inside or outside of it that mimic the function of an intact CCL.

The second type of surgery aims to reduce the movement in the joint by changing the overall distribution of force within it to eliminate the need for an intact CCL. Both types of surgeries have their advantages and disadvantages.

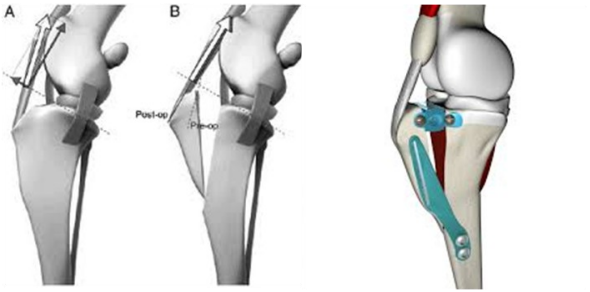
**CCL Mimicking Surgery (lateral stabilization suture)**

In this surgery, a heavy gauge of surgical nylon is placed in such a way that it takes the forces normally born by an intact CCL. During the recovery phase, fibrous (scar) tissue forms along the path taken from the nylon to provide long term stabilization because over time the nylon will stretch. It is very important to eliminate any chance of premature stretching in the post-op period, which would lead to less than optimal results.

This type of surgery is generally recommended for small to medium sized dogs that are not overly active. The recovery period is about 12 -16 weeks. Dogs with this repair will eventually develop some arthritic changes due to stretching of the nylon, but most go on to recover and function very well. The activity level and forces generated by young, active, and large dogs make it a less than ideal choice for them, and increases the risk of a less than acceptable result.

**Distribution of Force Surgery (tibial tuberosity advancement)**

This surgery reshapes the plateau of the tibia such that the normal forces generated by motion are redistributed to other structures in the joint, thus eliminating the need for a functional cranial cruciate ligament.




The front of the tibia is cut and repositioned with the aid of implants and plates. New bone grows to reshape the bone. The implants can stay for life, or may be removed once the bone has regrown. Recovery time for this surgery is about 12 weeks. It is the currently recommended surgery for young, active, and large dogs, though it can be performed on any dog that has a tibia within the size range of the currently manufactured implants. Occasionally, arthritis may still develop in these joints post-surgically.

Regardless of the type of surgery, the patient will have a strict post operative period for recovery that must be followed for the best possible outcome. The length of this period is determined by the type of surgery. Some dogs, especially those with significant pre-operative arthritis, may require extended use of pain relieving medications while others may only need them during the recovery phase.