

CRUCIATE LIGAMENT INJURY

A ruptured cruciate ligament is a painful orthopedic problem that can cause your dog to suddenly start limping on one of its back legs. Though there are many different reasons for limping in dogs, a ruptured cruciate ligament is one of the most common ones. A ruptured cruciate is a painful and immobilizing injury; while not life-threatening, it must be addressed.

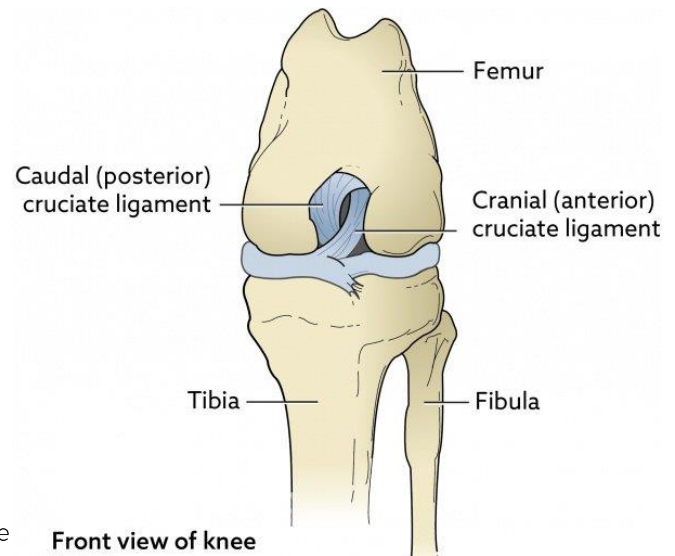
What and where are the cruciate ligaments?

The word cruciate means 'to cross over' or 'form a cross'. The cruciate ligaments are two bands of fibrous tissue located within each knee joint. They join the femur and tibia (the bones above and below the knee joint) together so that the knee works as a stable, hinged joint. One ligament runs from the inside to the outside of the knee joint and the other from the outside to the inside, crossing over each other in the middle. In dogs and cats, the ligaments are called the **CRANIAL AND CAUDAL CRUCIATE** ligaments. In dogs, the most common knee injury is a rupture or tear of the **cranial cruciate ligament**, or the anterior cruciate ligament (ACL in humans).

CRUCIATE DISEASE describes sudden or progressive failure of the cranial cruciate ligament causing partial or complete instability of the knee joint, while **CRUCIATE RUPTURE** refers to tearing of the cruciate ligament – tearing may be partial or complete (also called a sprain).

CRANIAL CRUCIATE RUPTURE is the most common cause of hind limb lameness, pain, and subsequent knee arthritis. Since the development of this problem in dogs is much more complex than in humans, and they experience different degrees of rupture; the canine condition is referred to as '**cranial cruciate ligament disease**' (**CrCLD**). While the clinical signs associated with CrCLD vary, the condition invariably causes rear limb dysfunction and pain. Most commonly CrCLD is caused by a combination of many factors, including aging of the ligament (degeneration), obesity, poor physical condition, genetics, conformation (skeletal shape and configuration), and breed. With CrCLD, ligament rupture is a result of subtle, slow degeneration that has been taking place over a few months or even years rather than the result of acute (sudden) trauma to an otherwise healthy ligament (which is very rare). Two important features of canine CrCLD are:

1. 40-60% of dogs that have CrCLD in one knee will, at some future time, develop a similar problem in the other knee.
2. Partial tearing of the CrCL is common in dogs and progresses to a full tear over time.



Affected Breeds

Cranial cruciate ligament disease can affect dogs of all sizes, breeds, and ages. Certain dog breeds are known to have a higher incidence (Rottweiler, Newfoundland, Staffordshire Terrier, Mastiff, Akita, Saint Bernard, Chesapeake Bay Retriever, and Labrador Retriever) while others are less often affected. **Poor physical body condition and excessive body weight are risk factors**, and are both factors that can be influenced by pet owners. Consistent physical conditioning with regular activity and close monitoring of food intake to maintain a lean body mass is advisable.

Symptoms: Dogs with CrCLD may exhibit any combination of the following signs (symptoms):

- difficulty rising from a sit
- trouble jumping into the car
- decreased activity level
- lameness (limping) of variable severity
- muscle atrophy (decreased muscle mass in the affected leg)
- decreased range of motion of the knee joint
- a popping noise (which may indicate a meniscal tear)
- swelling on the inside of the shin bone (fibrosis or scar tissue)
- pain

Diagnosing cruciate disease or tears can be easily accomplished by a veterinarian using a combination of gait observations, physical examination findings, and radiography (X-rays).

Treatment Options: The first major decision is between surgical treatment and non-surgical treatment/management. The best option for your pet depends on many factors including their size, age, skeletal conformation, and degree of knee instability. Although rest and medication may help, surgery is usually recommended to repair the ruptured cruciate ligament. There are several different surgical approaches, each with its pros and cons.

- Cruciate Surgery: Extracapsular Repair

In this method, a strong suture is placed to secure the femur and tibia, essentially replacing the function of the torn cruciate ligament. The suture supports the knee joint while scar tissue builds up and the muscles surrounding the knee strengthen. It must stay intact for eight to 12 weeks for healing to occur. This is a relatively quick and uncomplicated procedure with good success rates, especially for smaller dogs.

- Cruciate Surgery: TPLO

The tibial plateau leveling osteotomy (TPLO) is a more complex procedure than the extracapsular method and alters the biomechanics of the knee joint, allowing it to function properly without a cruciate ligament. A complete cut is made through the top of the tibia (tibial plateau). The tibial plateau is rotated to change the angle of this portion of the bone. A metal plate is affixed to repair the cut bone. The tibia heals over several months. Partial improvement can be seen within days; however, full recovery will take several months, so cage rest is essential. Generally, the long-term prognosis is good, and re-injury is uncommon. As with any surgery, complications are possible, including infection.

- Cruciate Surgery: TTA

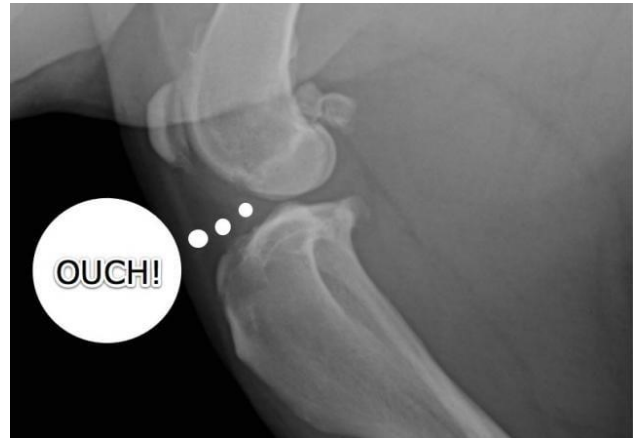
A third surgical method is the tibial tuberosity advancement (TTA). The details of this method are slightly different from a TPLO, but the TTA still involves cutting the tibia and placement of metal implants. Some surgeons describe the TTA as a less invasive procedure than the TPLO. The TTA may have a faster recovery than TPLO, as well, though some surgeons see little difference. The dog's anatomy and lifestyle are also deciding factors.

Post-Surgery Prognosis:

In general, the prognosis after surgery is good, with an 85 to 90 percent chance of a return to normal activity levels. Post-surgical medical management consists of multiple steps for your dog's long-term recovery. It helps to know that smaller dogs (weighing less than 25-30 pounds) may fare better than heavier dogs. Medical therapy involves the following:

- Several weeks of cage rest
- Brief, calm leash walks for bathroom breaks only
- Sit-to-stand exercises
- Underwater treadmill therapy and/or swimming
- Veterinary-approved oral anti-inflammatory drugs and supplements to support joint health

Following your vet's recommendations will give your dog the best chance of full recovery with fewer complications. As with any orthopedic surgery, it is common for dogs to develop arthritis in the future. With proper care, your dog can live a full, healthy, and comfortable life.



Non-surgical Treatment usually involves a combination of pain medications, exercise modification, joint supplements, physical rehabilitation, and possibly braces/orthotics.

1. **Activity restriction and anti-inflammatories** – While administration of pain medications to dogs with CrCLD may improve their comfort, knee pain remains because of the persistent knee instability present. For this reason, strict activity restrictions (e.g., leash-based activities) are typically most effective at reducing pain, and this treatment is generally limited to individual dogs in which surgery cannot be performed (i.e., financial constraints, illness, etc.)
2. **Rehabilitation therapy** – There is ample evidence that therapy under the care of a veterinarian fully trained in physical rehabilitation can hasten and even improve the recovery from surgery. However, there is scant evidence to suggest that this is a consistent and predictable alternative to surgical management of CrCLD in dogs.
3. **Custom knee bracing/orthotics** – Custom knee bracing is relatively new to canine orthopedics and there is no published data that supports its viability as a reasonable treatment in dogs with CrCLD. Much of the enthusiasm for dog knee bracing is extrapolated from their successful use in humans with ACL injuries. However, the mechanics of the canine and human knee are vastly different and it is unwise to make any comparisons between them relative to treatment modalities. At this time, there is not enough evidence to support any recommendation for knee bracing as a treatment of CrCLD

While a cruciate rupture cannot always be prevented, keeping your dog at a healthy weight and providing plenty of exercise (but not too strenuous) can minimize the risk.