

# Cruciate disease explained

Vet **James Grierson** provides an overview of this crippling condition and explains how it can be managed.

**T**he knee (stifle) joint plays an important role in allowing dogs free movement of the hindlegs, and any disease that affects it can impact mobility.

In dogs, the knee is a hinge joint, which is essentially made up of two major bones and one smaller bone. On one side is the femur (like our thigh) and on the other is the tibia (like our shin); the smaller bone is the patella (knee cap). There are two cartilage cushions (called menisci), situated between the femur and tibia, that act like shock absorbers for the knee (see Figure 1).

Cruciate disease affects the knee joint, and some of the breeds commonly affected by the condition include Labrador Retrievers, Golden Retrievers, Rottweilers, Mastiffs, West Highland White Terriers and Yorkshire Terriers.

## WHAT IS CRUCIATE DISEASE?

Cruciate disease is the most common orthopaedic condition affecting dogs, and it can affect one or both knee joints. The cranial cruciate ligament – one of the supporting ligaments of the joint – breaks down and then snaps.

Typically, the cruciate ligament degenerates over time (two to 18 months), resulting in an intermittent problem – until, one day, the

weakened ligament will snap completely, perhaps as your dog runs across the garden. This leads to excessive movement between the femur and tibia, sometimes called a cranial drawer or tibial thrust by vets, and leads to cartilage damage, followed by development of osteoarthritis (degenerative joint disease).

## DIAGNOSING CRUCIATE DISEASE

Cruciate disease is usually characterised by an abnormal hindlimb gait. Symptoms will vary depending on whether or not the ligament is partially torn or completely torn (See 'Typical clinical signs' on page 41). At home, owners may notice their dog appears stiff or lame on rising, is reluctant to jump into the car, sits down on walks and is weak in one or both hindlimbs; some report that their dog sits with the knee rotated outwards.

More severe cases may have non-weight bearing lameness on the affected leg after running, and some cases appear to be paralysed in the back legs when both ligaments rupture together. It's important to remember, though, that other conditions can cause similar signs in dogs and so examination by a vet is vital.

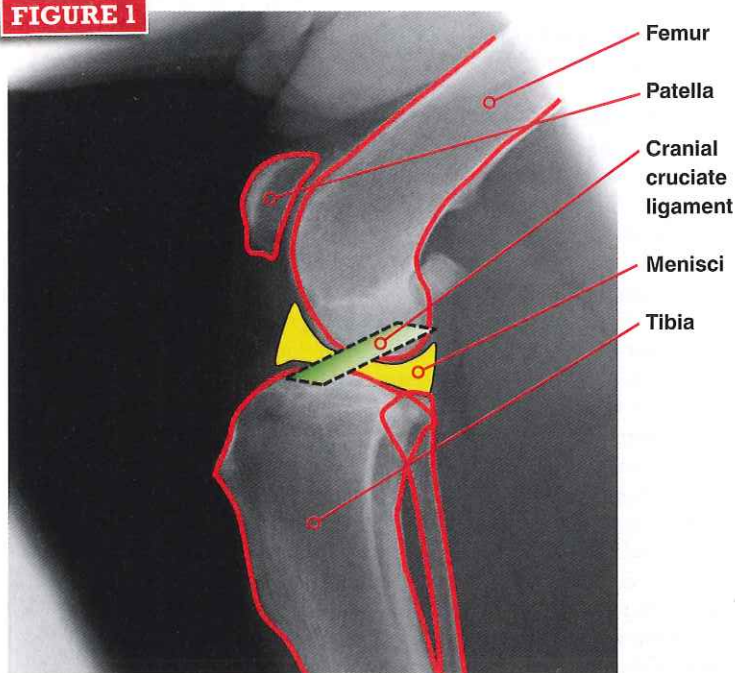
A diagnosis can often be

Cruciate disease doesn't just affect older dogs – it can occur between the age of six months and 15 years.

## Risk factors

- Rottweilers are five times more likely to rupture their cruciate ligament than other breeds.
- If your dog is obese, he is four times more likely to rupture his cruciate ligament than a dog of normal bodyweight – so keeping your dog slim is very important!
- Females are twice as likely as males to rupture their cruciate ligaments.
- Dogs aged less than two years are less likely to sustain cruciate rupture than dogs older than eight years.
- Rottweilers have the highest odds for bilateral cruciate rupture, and Golden Retrievers the lowest odds.



**FIGURE 1****The anatomy of a dog's knee joint.**

made after a vet has taken a complete health history for the dog, observed him walking and trotting, and performed a full physical and orthopaedic examination. The key part of this examination is feeling the knee for instability; this can be difficult in dogs that are well muscled or particularly tense. In these cases, feeling the knee under a general anaesthetic

or heavy sedation is needed to confirm the problem. X-rays are also taken to rule out other problems in the knee, but these will not show up ligament rupture or cartilage damage.

In the same way that your doctor can refer you to a consultant, your dog can be referred to the canine equivalent. Further examination and assessment by a specialist

orthopaedic surgeon, who is experienced with dealing with cruciate disease on a regular basis, can help classify the severity of the problem and then guide you towards the best management option for your dog. Specialists also have the benefit of advanced imaging and surgical techniques to help with diagnosing and managing the problem.

### WHAT NEXT?

When it comes to cruciate disease, prompt diagnosis and treatment is a priority in order to minimise further damage to the cartilage in the joint. The goal of any treatment is to restore normal stability to the knee joint but, unfortunately, the ligament can't be repaired.

There are many options for the management of dogs with ruptured cruciate ligaments, and it is an area of intense research among orthopaedic specialists. Small dogs (weighing less than 10kg) can be managed conservatively with strict rest and pain relief, until there is enough thickening of tissue around the joint to allow it to become stable. Larger dogs are best managed with surgical intervention.

A key step during surgery is to thoroughly examine inside the joint to look for damage to the menisci. If this part of the surgery is omitted, dogs can be left with continued pain and lameness.

## Typical clinical signs

- **Subtle (partial tear)** – abnormal gait characterised by stiffness on rising or subtle intermittent lameness following exercise. Some owners report on/off lameness over a period of 12-18 months prior to complete ligament rupture.
- **Severe (complete tear)** – sudden onset lameness following running with non-weight bearing lameness.

## SURGICAL OPTIONS

There are many surgical techniques for managing this condition, which have evolved over the years. The most common techniques performed are replacement of the ligament with tissue from the dog, such as skin or fascia (a layer of fibrous tissue that connects muscles to other muscles), or replacement of the

**If your dog is obese, he is four times more likely to rupture his cruciate ligament than a dog of normal bodyweight.**

**FIGURE 2**

A dog's knee joint after tibial tuberosity advancement (TTA).

**FIGURE 3**

This is an X-ray of a dog's knee (side view) that has a cruciate rupture (the ligament is invisible on X-rays). This is the appearance before surgery.

**FIGURE 4**

A dog's knee joint after tibial plateau levelling osteotomy (TPLO).

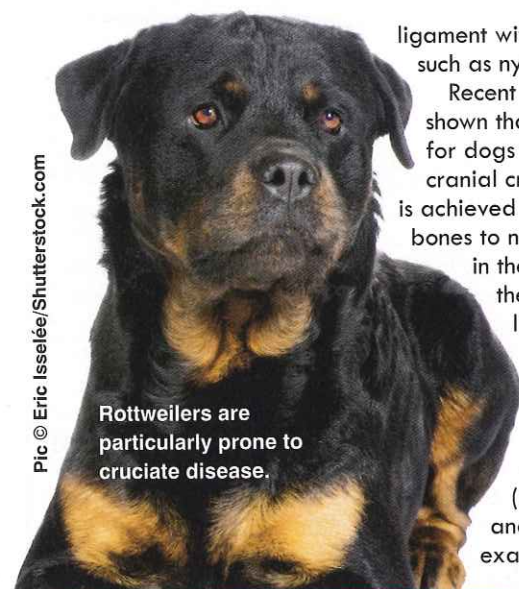
## Common misconceptions

- **Cruciate rupture is due to an acute trauma causing the ligament to rupture.** This is not true in the vast majority of cases. The exact cause of cruciate disease is unknown, but there are many theories. Only a small minority are due to an acute direct trauma, with most being secondary to inflammation in the ligament that leads to the rupture when it can no longer take the strain (much like a thick rope that starts to fray before it snaps completely).
- **Cruciate injuries only occur in older dogs.** This is often stated but is not true. While older dogs (eight years plus) are more likely to develop cruciate disease than younger dogs, it can also occur in individuals less than two years of age; the range is six months to 15 years.



## Health & welfare

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Rottweilers are particularly prone to cruciate disease.

ligament with artificial material such as nylon.

Recent research has shown that the best outcome for dogs with a ruptured cranial cruciate ligament is achieved by altering the bones to neutralise the forces in the joint, meaning the cranial cruciate ligament is no longer needed. There are a number of similar techniques that involve cutting the bone (an osteotomy) and moving it – for example, a tibial tuberosity

advancement (TTA; see Figure 2) or tibial plateau levelling osteotomy (TPLO). Although these techniques are all slightly different, they achieve the same effect, and these osteotomies are

now considered to be the gold standard in management of this condition.

Think of the cruciate ligament as a handbrake on a car – the handbrake is needed to park your car on a hill, but if the handbrake fails (the cruciate ligament ruptures; see Figure 3) the car will roll away (this is the cranial drawer/tibial thrust that your vet feels). To solve the problem, you have to park your car on a flat area and there is no need for the handbrake. So we cut the dog's bone and move it so that there is no longer a slope in the joint (see Figure 4).

Strict control is necessary following these procedures to minimise complications and ensure that they are a success; typically, dogs will initially need to be confined for six weeks.

### LONG-TERM MANAGEMENT

Cruciate disease is the most common orthopaedic condition in dogs, but with prompt

diagnosis, appropriate management and surgery, the vast majority can return to relatively normal levels of exercise.

It must be remembered, though, that osteoarthritis is inevitable following cruciate injuries; maintaining a lean body weight is the most effective way to minimise the impact of osteoarthritis in the long term.

Close consultation with your veterinary surgeon in conjunction with a specialist orthopaedic surgeon will help you decide how best to manage your dog's condition. ●

### What's the cost?

If surgery is performed by a recognised specialist in surgery, on an average-sized dog (for example, a Labrador), you can expect to pay between £2,600 and £3,000 for TPLO or TTA. The average cost for replacement of the ligament with artificial material, such as nylon, would be between £1,600 and £2,000.

### About the author



**James Grierson**  
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