



# Intervertebral Disk Disease

## Who can be affected?

*Disk disease is more prevalent in certain breeds of dogs. Dachshunds, Beagles, Shih Tzus/Lhasas, Bichons, Cocker Spaniels and Corgis are among the most common, but even cats can develop it.*

*Any disk can rupture, but the disks in the mid-back and neck are at the highest risk. This information will focus on problems with disks in the mid-back.*

*The good news is that disk disease is usually curable with surgery, and many dogs have a good chance of getting through their first episode of pain and mild weakness without surgery.*

## Signs of Disease

Pain is caused by stretching of the nerve roots and spinal cord lining. Weakness and decreased proprioception (sense of limbs in space) occur as compression inhibits signals between the brain and limbs.

## Pain & Weakness

- Decreased appetite for normal food
- Hiding, being quiet, aggressive or irritable
- Tense abdomen or yelping when being picked-up
- Reluctance to jump, use stairs or walk
- Falling when walking

## Decreased Proprioception

- Standing with toes knuckled under foot
- Standing with feet too close or too far apart
- Crossing one leg in front of the other when walking
- Ataxia (disordered way of walking)

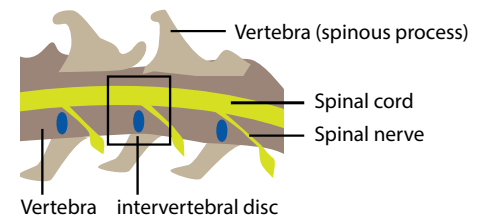
## Correction of Knuckling

A veterinarian will test for significant cord compression by looking for the inability to flip the toes back when knuckled. This represents a loss of proprioception.

## Anatomy

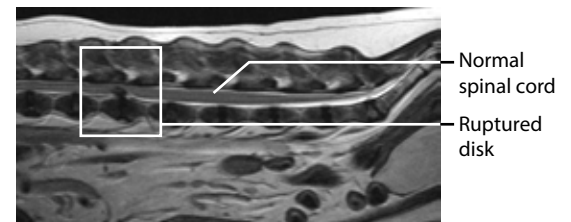
The spinal cord carries movement and sensory information between the brain and limbs. It is protected by a segmented, bony box called the vertebral column. Each segment or vertebra is cushioned by a disk.

The intervertebral disks are usually well hydrated, spongy, and wrapped by ligament. At rest, the disk is under pressure and movement of the vertebrae increases the pressure within the disk.



## Disease

In disk rupture, the ligament wrapping the disk becomes weak and the contents of the disk dehydrate. Either spontaneously, or with sudden movement, the ligament can tear and the pressurized contents strike and persistently compress the spinal cord. This process causes pain and/or weakness. The disease progresses when persistent compression damages neurons and blood vessels, causing chemically mediated damage and decreased blood flow to the spinal cord.



## Progression

With persistent or progressive spinal cord compression fewer signals can pass through the spinal cord.

- Inability to move one or more limbs
- Inability to move tail
- Poor control of urination or defecation
- Loss of deep pain sensation
- Loss of muscle tone of back legs

## Deep Pain Perception

The inability to sense a deep pain stimulus is serious, indicating that no signals can pass through the severely damaged spinal cord. This can be tested by clamping the toe or tail with a hemostat and looking for a pain reaction.

Pain management and strict rest are necessary to recover from disk disease. Pain medication must be coupled with exercise restriction. Confinement to a crate or small area is optimal. Running, jumping, stairs, and excessive movement should be prohibited. Being carried from the crate to outside and walking just a few steps in order to eliminate is ideal.

Pain medication and exercise restriction should continue until there are no signs of pain or weakness. At this point, the medication should be stopped, but exercise restriction should continue for an additional seven days. If at the end of seven days there are still no signs of pain or weakness, then there can be a slow return to nearly normal activity. As a precaution against repeated episodes of disk disease a patient should spend the rest of their life with four feet on the ground.

## Surgery

During surgery the disk material causing the compression is removed allowing the spinal cord to heal and better transmit signals. At the same time, fenestration is performed by placing small holes in adjacent disks to decrease pressure and significantly reduce recurrence rates.

There is a 1-3 day hospital stay following surgery. Once the patient is eating and comfortable, the exercise restriction can be continued at home. A follow up visit is scheduled about two weeks after surgery during which a less restrictive exercise plan is explained. At six weeks following surgery there can be a slow return to nearly normal activity.

## Medicine vs Surgery

Medical management is successful greater than 50% of the time. Although strict rest may resolve the first episode of weakness, the chance of a recurrence is very high. Recurrences are generally more severe than the initial episode and can be harder to fix surgically.

Surgery is successful greater than 95% of the time when the patient is still able to perceive a deep pain stimulus prior, and the odds are even better if they are able to voluntarily wag their tail. High success rates and low recurrence rates make surgery an ideal option in most cases. Benefits unique to surgery include immediate pain control, rapid return to function, and low recurrence rates. Surgery is advised in four circumstances:

1. Repeat episodes of pain and /or weakness
2. First time episode but poor response to medical management
3. Patient is unable to stand or walk
4. Advanced imaging shows moderate to severe spinal cord compression

Once there is loss of deep pain and/or tone, success rates can drop dramatically and about 10% of these patients can die from spinal cord disease. MRI is very useful in predicting success rates in surgical management of dogs without deep pain. For this reason, MRI is highly recommended in this situation.

## Diagnosis

At BVNS we use either CT scanning or a MRI to make the diagnosis and plan for surgery, when necessary. CT has the advantage of being accurate and fast but CT does not give information about the health of the spinal cord. MRI provides much more information and is selected in cases that are deep pain negative or when the neurologist has a sense the diagnosis might not be disk disease. Myelography is rarely performed due to the risks and decreased diagnostic yield relative to CT and MRI.

## Clinical Trial

BVNS is collaborating with NCSU veterinary school in a clinical trial comparing placebo, high dose steroid therapy and polyethylene glycol in dogs that are deep pain negative and have surgery. It is expected that steroid therapy will make no difference in outcome and make some dogs sick while polyethylene glycol might help some dogs to recover. We do not advise therapy with high doses of steroid.

### Functional Recovery Rates with Disk Disease Diagnosis in Dogs when Deep Pain is Present

	With Surgery	Without Surgery
Functional Recovery	>95%	>50%
Major Recurrence*	5%	50%
Minor Recurrence**	30%	90%

\*Major – inability to walk or severe pain that does not improve with medical management.

\*\*Minor – 1-2 days of weakness or discomfort.

Functional outcome following hemilaminectomy without methylprednisolone sodium succinate for acute thoracolumbar disk disease in 51 non-ambulatory dogs. Bush WW, Tiches, DM, et al. *Journal of Veterinary Emergency and Critical Care*, Volume 17, Issue 1, p. 72-76, March 2007



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