

Intervertebral disc disease in dogs

What is intervertebral disc disease (IVDD)?

IVDD is one of the most common conditions affecting the spinal cord in the dog. The spinal column is composed of bones called vertebrae. The vertebrae form a canal that surrounds the spinal cord. Intervertebral discs sit in between the vertebrae. These discs act as shock absorbers and provide strength and stability to the spinal column.

IVDD is a general term that refers to the condition in which the intervertebral disc protrudes / herniates from its normal anatomic location, usually because of degeneration of the disc. This herniation of the disc results in damage to, and compression of, the overlying spinal cord.

What are the clinical signs of IVDD?

Neurologic signs are dependent on the location of disc herniation and the degree of spinal cord injury. Signs often occur in stages:

- Mild compression or injury may only cause pain.
- More severe compression or injury causes an uncoordinated (unsteady) gait, crossing over of the legs when walking, scuffing of the nails, and weakness (paresis).
- As the spinal cord injury worsens, the animal loses the ability to move the legs (paralysis) and may have difficulty urinating voluntarily.
- With the most severe injuries, affected animals are unable to feel a painful stimulus applied to their toes and or tail.

Some dogs progress through these stages of neurologic dysfunction rapidly, whereas other dogs experience only pain. Because prognosis and treatment options vary with the severity of neurologic dysfunction, it is important for affected animals to be examined by a veterinarian at the onset of clinical signs. Compression of the spinal cord in the neck region causes signs in all four legs, whereas compression in the back region causes signs in only the hind legs. Disc herniation can occur anywhere along the vertebral column; however, the thoracolumbar area (end of the chest and beginning of the back) is the site most commonly affected.

What causes IVDD?

Three types of IVDD occur in the dog:

- Type I causes sudden compression and damage to the spinal cord by rupturing out of its place.
- Type II causes a slow compression of the spinal cord due to a bulge or protrusion upward into the spinal canal.
- Type III causes sudden damage to the spinal cord by rupturing out of place but is not associated with compression of the spinal cord.

The age, breed, onset of clinical signs, and treatment options vary with the type of IVDD:

- Type I primarily affects young to middle-aged (3-6 years) dogs with short legs and long backs, such as the dachshund, French bulldog, Lhasa apso, shih tzu, beagle, cocker spaniel, and corgi. Onset of signs is typically sudden (acute).
- Type II primarily affects older, large-breed dogs such as the German shepherd dog and the Labrador retriever. Onset of clinical signs is often slow (chronic) and progressive over weeks to months with intermittent bouts of short-term pain.
- Dogs with type III IVDD have a sudden onset of clinical signs, may or may not be painful and may not require surgery.

How is IVDD diagnosed?

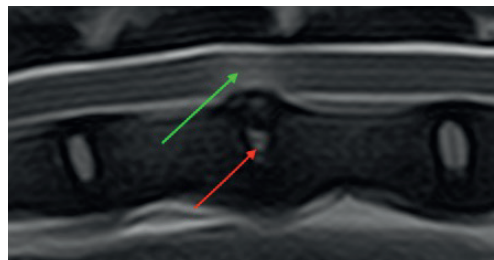
IVDD may be suspected based on history and neurologic findings, however, additional tests are required to confirm IVDD and allow appropriate treatment planning.

- X-rays may indicate IVDD, but they can be normal and do not provide enough information to plan surgical treatment.
- Magnetic resonance imaging (MRI) is the best imaging modality to evaluate the spinal cord and intervertebral discs, and it provides enough detail to plan appropriate treatment.

If surgical treatment is pursued, MRI is required, and all these procedures require general anesthesia.



A large disc has ruptured into the spinal canal and is compressing the cord (arrow)



A non-compressive disc extrusion with cord damage noted (green arrow) – MRI clearly shows loss of the nucleus from the disc space beneath (red arrow).

How is IVDD treated?

Treatment of IVDD can consist of conservative and surgical therapy. The degree and duration of the neurologic signs are important factors when deciding upon treatment options.

Conservative therapy can be tried in dogs if mild pain and incoordination are the sole clinical signs; that is, the dog can walk but with an unsteady gait (ataxia). Conservative therapy consists of exercise restriction, anti-inflammatory drugs, and pain medications.

- Exercise restriction involves strict confinement and limited leash walking (only for the purpose of urinating and defecating). Dogs should not be allowed to run, jump, or play during their confinement. Exercise restriction typically lasts 4-6 weeks and is followed by a gradual return to normal activity over an additional month.
- Anti-inflammatory drugs, such as non-steroidal anti-inflammatory or steroid medications, can be used. These two classes of drugs are not used together because of their combined side effects.
- Pain medications and muscle relaxants may be used to alleviate discomfort.

Surgical therapy is usually chosen in dogs with severe neurologic problems, such as moderate to severe incoordination, weakness, inability to walk, paralysis, or pain that is unresponsive to medications. Surgery is also considered in dogs whose signs recur.

- Surgery involves the removal of herniated, compressive disc material followed by exercise restriction as outlined for conservative therapy.
- Surgery may require removal of a portion of the vertebra at the site of compression to provide access to the spinal canal.
- After removal of the bone, the disc material is delicately removed from within the spinal canal to relieve spinal cord compression.
- Postoperatively, the animal is strictly confined for 4-6 weeks.

Manual emptying of the bladder may be needed if the dog cannot urinate voluntarily. Good nursing care is important until the dog can walk well by itself. Pain and anti-inflammatory medications may also be used after surgery.

Recovery time varies depending on the onset (acute versus chronic) and severity of the clinical signs. Typically, time to recovery for dogs treated with surgery is 1-2 weeks. Severely affected dogs may require months to regain function of their legs and bladder; however, dogs treated conservatively may

also require 1-2 weeks to regain function. Some severely affected dogs do not regain the ability to walk again, and some have persistent urinary incontinence. Carts (similar to wheelchairs) have been developed to assist dogs that are unable to walk. Maximal improvement occurs in the majority of dogs by 3-months after the initial injury to the spinal cord. Further improvement after this time is unlikely. Periodic rechecks are often needed throughout this period.

Most dogs with only mild to moderate pain or mild neurologic signs return to normal function with conservative therapy. Prognosis for more severely affected dogs treated with conservative therapy is poor. Dogs that are managed with surgery have a good prognosis for return to normal function even if they initially have moderate to severe neurologic signs. As long as the dog can still perceive a painful stimulus applied to the affected legs, and even if the legs are paralyzed, there is a reasonably good chance that normal function will be regained with surgery.

The prognosis is very poor for dogs that are paralyzed and unable to perceive a painful stimulus in their legs. If treated surgically within the first 24-48 hours after onset of paralysis, dogs unable to perceive pain have a 50-60% chance of regaining the ability to walk. If left untreated for longer than 48 hours, these dogs have a grave prognosis for regaining the ability to walk and for having control of their bladder.

Recurrence of clinical signs suggestive of another intervertebral disc herniation can happen in some dogs. Recurrence is most likely within 2 years after the first episode and tends to occur more often in dogs that were managed conservatively.