

CLINICAL GRADING SCALE FOR THORACOLUMBAR INTERVERTEBRAL DISC DISEASE (IVDD)			
GRADE	DESCRIPTION	What percentage of dogs get better without surgery?	What percentage of dogs get better with surgery?
1	Painful*, but able to walk normally or almost normally	70-100% ^{1,2,3,4}	About 95% ⁵
2	Able to walk. The walk is wobbly and/or ataxic (“drunken sailor” type walking)	55-100% ^{1,2,3,4}	
3a	Unable to walk or stand unassisted. Can bear weight on affected legs if the body is supported.	55-80% ^{1,3,4}	80-90% ^{5,6,7,8,9} Recovery times vary. Dogs typically walk within 1-3 weeks, though some take 2 months or more. ^{5,6,7,8}
3b	Unable to walk or stand unassisted. Cannot bear weight on affected legs, even if the body is supported.		
4a	Cannot make any deliberate movements with the affected legs	40-80% ^{1,3,4,10}	
4b	Cannot make any deliberate movements with the affected legs <i>plus</i> No superficial pain in toes of affected legs		
5	Cannot make any deliberate movements with the affected legs <i>plus</i> No deep pain in toes of affected legs	Only up to about 30% of these dogs walk again without surgery. ^{1,3,4} Up to 17.5% of grade 5 dogs will go downhill during the first week due to PMM [†]	About 50-60% ^{8,9,11,12,13,14} Recovery can take up to 9 months or more, though most “successful” dogs walk within 6-12 weeks ^{8,9,11,13} Up to 17.5% of grade 5 dogs will go downhill during the first week due to PMM [†]

Refs: 1) Levine et al 2007, 2) Mann et al 2007, 3) Davies & Sharp 1983, 4) Hayashi et al 2007, 5) Aikawa et al 2012, 6) Davies & Brown 2002, 7) Ferreira, Correia & Jaggy 2002, 8) Ito et al 2005, 9) Kazakos et al 2005, 10) Joachim et al 2010, 11) Jeffery et al 2016, 12) Laitinen et al 2005, 13) Scott & McKee 1999.
 Full references are listed on p2-3

Further information is available at <http://therehabvet.com/2017/10/ivdd-clinical-grading-scale/>

*Dogs of all grades (1-5) are painful, especially around the affected area of their spine.

† PMM (progressive myelomalacia) is a painful and untreatable condition that causes progressive deterioration. It is seen in up to 17.5% of grade 5 dogs^{5,14,15}.

References

1. Levine, J. M., Levine, G. J., Johnson, S. I., Kerwin, S. C., Hettlich, B. F., & Fosgate, G. T. (2007). Evaluation of the success of medical management for presumptive thoracolumbar intervertebral disk herniation in dogs. *Veterinary surgery*, 36(5), 482-491. A retrospective questionnaire-based study looking at non-surgical management. Out of 122 grade 1 dogs, 84 recovered (69%). Out of 63 grade 2 dogs, 35 recovered (56%). Out of 23 grade 3 dogs, 13 recovered (57%). Out of 12 grade 4 dogs, 6 recovered (50%). Out of 3 grade 5 dogs, none recovered.
2. Mann, F. A., Wagner-Mann, C. C., Dunphy, E. D., Ruben, D. S., Rochat, M. C., & Bartels, K. E. (2007). Recurrence rate of presumed thoracolumbar intervertebral disc disease in ambulatory dogs with spinal hyperpathia treated with anti-inflammatory drugs: 78 cases (1997–2000). *Journal of Veterinary Emergency and Critical Care*, 17(1), 53-60. . A retrospective questionnaire-based study looking at non-surgical management. Out of 77 grade 1-2 dogs treated non-surgically, 100% recovered, but around 50% then experienced a recurrence of clinical signs. Most but not all recurrences happened within the first year (median 9 months after first episode). Recurrence rate was significantly higher in dogs treated with corticosteroids than in dogs treated with NSAIDs.
3. Davies, J. V., & Sharp, N. J. H. (1983). A comparison of conservative treatment and fenestration for thoracolumbar intervertebral disc disease in the dog. *Journal of Small Animal Practice*, 24(12), 721-729. Out of 8 grade 1 dogs managed non-surgically, 100% recovered. Out of 38 grade 2 dogs managed non-surgically, 84% recovered. Out of 10 grade 3 dogs managed non-surgically, 100% recovered. Out of 6 grade 4 dogs managed non-surgically, 3 recovered (50%). Out of 14 grade 5 dogs managed non-surgically, 1 recovered (7%). Mean average recovery times were 3 weeks (grade 1 dogs), 6 weeks (grade 2 dogs), 9 weeks (grade 3 dogs), 12 weeks (grade 4 dogs) and 4 weeks (grade 5 dog). Signs of IVDD recurred at a later date in some cases, though the severity of recurrence is not stated. Rate of recurrence was 28% (grade 1 dogs), 27% (grade 2 dogs), 66% (grade 3 dogs), 33% (grade 4 dogs).
4. Hayashi, A. M., Matera, J. M., & de Campos Fonseca, A. C. B. (2007). Evaluation of electroacupuncture treatment for thoracolumbar intervertebral disk disease in dogs. *Journal of the American Veterinary Medical Association*, 231(6), 913-918. 16 out of 19 (84%) grade 3 and 4 dogs regained the ability to walk without surgery (Hayashi et al 2012). Out of 14 grade 5 dogs managed non-surgically, 4 regained the ability to walk. According to the authors, “most” dogs in this study were only assessed over a period of three weeks. Therefore it may be possible that recovery continued beyond this point in some “unsuccessful” dogs, and also that recurrence may have occurred in “successful” dogs. Some of the dogs in this study had received electroacupuncture.
5. Aikawa, T., Fujita, H., Kanazono, S., Shibata, M., & Yoshigae, Y. (2012). Long-term neurologic outcome of hemilaminectomy and disk fenestration for treatment of dogs with thoracolumbar intervertebral disk herniation: 831 cases (2000–2007). *Journal of the American Veterinary Medical Association*, 241(12), 1617-1626. In 279 **grade 1-2** dogs, 96.8% had a good long term outcome, but there was a non-ambulatory period after surgery in many dogs, with only 86.7% dogs walking within 14 days, and 3% of “successful” cases not walking until 2 months post-op. There was a **95%** good outcome in 180 **grade 3** dogs. 81.9% of dogs walked within 2 wks. 2.3% of dogs took >61 days to walk again. Mean time to walking was 7.7 days (Aikawa et al 2012). Outcome was 98% successful in 161 **grade 4** dogs. Approx 70% walked within 14 days, and about 8% dogs took >61days to walk again. Mean time to walking was around 11 days. **52%** of 211 **grade 5** dogs recovered ambulation. 36% of successful cases could walk within 14 days. 26% walked within 15-30 days, 18% walked at between 31-60 days. 11% walked at between 2-6 months. 3% walked at between 6-12 months. The remaining few dogs were lost to follow-up.
6. Davis, G. J., & Brown, D. C. (2002). Prognostic indicators for time to ambulation after surgical decompression in nonambulatory dogs with acute thoracolumbar disk extrusions: 112 cases. *Veterinary surgery*, 31(6), 513-518. Out of 112 grade 3 and 4 dogs, 96% were able to walk within 3 months of surgery. Mean time to ambulation was 12.9 days (range 1-55 days) and surgical decompression was performed within 6 days of onset of non-ambulatory status. There was an *inverse* relationship between “time between onset of clinical signs and surgery” and “time to ambulation following surgery”.
7. Ferreira, A. J. A., Correia, J. H. D., & Jaggy, A. (2002). Thoracolumbar disc disease in 71 paraplegic dogs: influence of rate of onset and duration of clinical signs on treatment results. *Journal of small animal practice*, 43(4), 158-163. Out of 71 grade 3 and 4 dogs, 86% regained the ability to walk following surgical decompression. Mean time to ambulation was 10.8 days (range 1-60 days). NB: 17% of the 71 dogs regained the ability to walk but were left with ongoing paraparesis and/or pain. The authors looked at whether or not “time from start of clinical signs to surgery” affected outcome. On average (mean value), dogs that regained the ability to walk had spinal surgery at 6.7 days after onset of clinical signs. Within the study group, only 7 dogs had surgery within 2 days of onset of clinical signs, 31 dogs had surgery at 2-6 days after onset of clinical signs, 33 dogs had surgery at >6 days after onset of clinical signs (maximum delay to surgery is not stated). Dogs operated within 6 days recovered walking ability on average 4.5 days sooner than dogs operated after 6 days. However, time from start of clinical signs to surgery did not affect the dogs’ eventual outcome (i.e. whether or not they regained walking ability).

8. Ito, D., Matsunaga, S., Jeffery, N. D., Sasaki, N., Nishimura, R., Mochizuki, M., ... & Ogawa, H. (2005). Prognostic value of magnetic resonance imaging in dogs with paraplegia caused by thoracolumbar intervertebral disk extrusion: 77 cases (2000–2003). *Journal of the American Veterinary Medical Association*, 227(9), 1454-1460. Out of 48 grade 3 and 4 dogs, 92% regained the ability to walk. For grade 3 and 4 dogs, surgery was performed at up to 30 days after onset of clinical signs and, within this group, time to surgery did not affect outcome. Mean time to ambulation with only slight ataxia was 45 days (range 7 to 180 days). Out of 28 grade 5 dogs, 18 (64%) regained the ability to walk. Mean time to ambulation for grade 5 dogs was 30 days (range 14 to 270 days). For grade 5 dogs, surgery was performed at up to 11 days after onset of clinical signs. Time from onset of clinical signs to surgery did not affect outcome.
9. Kazakos, G., Polizopoulou, Z. S., Patsikas, M. N., Tsimopoulos, G., Roubies, N., & Dessiris, A. (2005). Duration and severity of clinical signs as prognostic indicators in 30 dogs with thoracolumbar disk disease after surgical decompression. *Transboundary and Emerging Diseases*, 52(3), 147-152. 6/6 grade 3 dogs all did well after surgery. 8/11 (73%) grade 4 dogs had a "fair to good" outcome, ie. they could walk. Out of 8 grade 5 dogs, 4 regained the ability to walk after surgery (Kazakos et al 2005). Walking took 15 days -2 months.
10. Joaquim, J. G., Luna, S. P., Brondani, J. T., Torelli, S. R., Rahal, S. C., & de Paula Freitas, F. (2010). Comparison of decompressive surgery, electroacupuncture, and decompressive surgery followed by electroacupuncture for the treatment of dogs with intervertebral disk disease with long-standing severe neurologic deficits. *Journal of the American Veterinary Medical Association*, 236(11), 1225-1229. The study looked at 19 severely-affected dogs treated with conservative management including electroacupuncture (these were 9 grade 4 dogs and 10 grade 5 dogs). 15/19 (79%) improved to grade 1-2 within 6months.
11. Jeffery, N. D., Barker, A. K., Hu, H. Z., Alcott, C. J., Kraus, K. H., Scanlin, E. M., ... & Levine, J. M. (2016). Factors associated with recovery from paraplegia in dogs with loss of pain perception in the pelvic limbs following intervertebral disk herniation. *Journal of the American Veterinary Medical Association*, 248(4), 386-394. Out of 78 grade 5 dogs managed with surgery, 58% had a successful outcome (walking within 3 months). Dogs were not followed up beyond 3 months post-op. For recovered dogs, median time to ambulation was 27 days. Mean time and range not stated. Dogs in this study were first assessed at the referral centre at up to 48.1hours after loss of ambulation. Clinical signs started up to 4.9 days before treatment. Time between onset of clinical signs and surgery did not affect outcome.
12. Laitinen, O. M., & Puerto, D. A. (2005). Surgical decompression in dogs with thoracolumbar intervertebral disc disease and loss of deep pain perception: a retrospective study of 46 cases. *Acta veterinaria scandinavica*, 46(2), 79. Out of 46 grade 5 dogs, 41.3% recovered following surgery (Laitinen & Puerto 2005). Variable follow-up period (0-52weeks) and time to ambulation is not stated.
13. Scott, H. W., & McKee, W. M. (1999). Laminectomy for 34 dogs with thoracolumbar intervertebral disc disease and loss of deep pain perception. *Journal of small animal practice*, 40(9), 417-422. Out of 34 grade 5 dogs, 62% recovered after surgery (Scott & McKee 1999). Dogs in this study had lost deep pain 0-72 hours before surgery. Time to recovery varied from 1 to 11 weeks.
14. Olby, N., Levine, J., Harris, T., Muñana, K., Skeen, T., & Sharp, N. (2003). Long-term functional outcome of dogs with severe injuries of the thoracolumbar spinal cord: 87 cases (1996–2001). *Journal of the American Veterinary Medical Association*, 222(6), 762-769. 64 of 70 dogs with intervertebral disk herniation underwent surgery; 9 (14%) were euthanized within 3 weeks after surgery (7 because of ascending myelomalacia), 37 (58%) regained DPP and the ability to walk, 7 (11%) regained the ability to walk without regaining DPP, and 11 (17%) remained paraplegic without DPP. Outcome was not associated with any of the factors evaluated, but speed of recovery of ambulation was significantly associated with body weight and age. 15 (41%) and 12 (32%) dogs that regained DPP had intermittent fecal and urinary incontinence, respectively.
15. Olby, N. J., Muguet-Chanoit, A. C., Lim, J. H., Davidian, M., Mariani, C. L., Freeman, A. C., ... & Longshore, R. (2016). A placebo-controlled, prospective, randomized clinical trial of polyethylene glycol and methylprednisolone sodium succinate in dogs with intervertebral disk herniation. *Journal of veterinary internal medicine*, 30(1), 206-214. A prospective clinical trial. 63 dogs with grade 5 thoracolumbar IVDD underwent spinal surgery within 24 hours of onset of clinical signs. 47.6% of these dogs regained the ability to walk by the end of the study at 12 weeks post-op. 17.5% of dogs developed progressive myelomalacia within the first week.