

Genetics

The inheritance of canine epilepsy has not been determined in the vast majority of breeds and is likely to be complex and the result of polygenic susceptibility alleles (for current understanding of genetics see table below). There is ongoing research into the genetics of epilepsy in the Finnish Spitz, Lagotto Romagnola, Belgian shepherd (Groenendael and Tervueren), Shetland Sheepdog, Beagle, miniature poodles, Keeshonds and Bassett Griffon Vendeen. A high heritability has been demonstrated in German Shepherd. Other breeds with a particularly high incidence of epilepsy are the Border collie, Boxer, Border terrier (partial motor seizures also known as Spike's disease), Staffordshire bull terrier, Italian Spinone, English and Irish Setters and German Wire-haired Pointer.

Breed	Type of seizure	Proposed Inheritance	Reference
Belgian shepherd (Groenendael and Tervueren).	partial / partial with secondary generalisation / generalised	oligogenic with probable single gene with significant influence Homozygotes will be epileptic and heterozygotes have increased risk of epilepsy heritability 0.77	Acta Vet Scand. 2008 Dec 22;50:51 J Hered. 2003 Jan-Feb;94(1):57-63; Vet Rec. 2000 Aug 19;147(8):218-21 J Small Anim Pract. 1997 Aug;38(8):349-52
Finnish Spitz	Partial / generalised		J Vet Intern Med. 2007 Nov-Dec;21(6):1299-306.
Lagotto Romagnola	simple or complex partial seizures (juvenile)	autosomal recessive	J Vet Intern Med. 2007 May-Jun;21(3):464-71.
Bernese Mountain dog	Generalised	autosomal multifactorial recessive, male dogs at increased risk.	J Small Anim Pract. 1999 Jul;40(7):319-25
English Springer spaniel	Partial / generalised	partially penetrant autosomal recessive inheritance (ie, a single major locus with modifying genes) or polygenic inheritance	J Am Vet Med Assoc. 2005 Jan 1;226(1):54-8.
Golden Retriever	Partial/generalised	autosomal multifactorial recessive	Tierarztl Prax. 1994 Dec;22(6):574-8.
Irish Wolfhound	Generalised	autosomal recessive, with incomplete penetrance, male dogs at increased risk.	J Vet Intern Med. 2006 Jan-Feb;20(1):
Keeshonds	Generalised	autonomic simple recessive	Vet Rec. 1996 Apr 13;138(15):358-60
Labrador Retriever	Partial/generalised	autosomal multifactorial recessive	J Small Anim Pract. 1998 Jun;39(6):275-80.
Boxer	Generalised	Hereditably of 0.18 rising to 0.21 for severe epilepsy	Tijdschr Diergeneeskd. 2003 Oct 1;128(19):586-90
Miniature Wirehaired Dachshunds	Lafora' disease Myoclonic / generalised / Complex partial	Autosomal recessive – disease mutation identified	Science. 2005 Jan 7;307(5706):81
Standard Poodle	Partial / generalised May begin > 5 years of age.	Simple recessive autosomal trait with complete or almost complete penetrance.	J Am Vet Med Assoc. 2007 Nov 15;231(10):1520-8
Vizsla	Complex partial (esp limb tremors, staring, pupillary dilatation, or salivation / generalised	autosomal recessive trait (polygenic could not be excluded)	J Vet Intern Med. 2003 May-Jun;17(3):319-25

There are ongoing programs at a number of institutions to collect DNA from dogs with epilepsy with a view to identifying the causal gene(s)

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[UK - Animal Health Trust](#) (Border Collies)

[Finland](#)

[USA](#)

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