

**Table S2.** Inherited disorders in pedigree dogs.

Table organized in alpha order by affected organ system. Organ system, the primary organ system affected by the disorder ; Condition, the name of inherited disorder and common synonyms in brackets; Breed, the breeds affected by the disorder denoted by code (AT = Airedale Terrier, AUT = Australian Terrier, ACD = Australian Cattle Dog, AP = Affenpinscher, AH = Afghan Hound, ASD = Anatolian Shepherd Dog, AS = Australian Shepherd, AST = Australian Silky Terrier, AWS = American Water Spaniel, BJI = Basenji, BGVG = Basset Griffon Vendeen (Grand), BGVF = Basset Griffon Vendeen (Petit), BMH = Bavarian Mountain Hound, BC = Bearded Collie, BN = Beauceron, BT = Bedlington Terrier, BSM = Belgian Shepherd (Malinois), BST = Belgian Shepherd (Tervueren), BMD = Bernese Mountain Dog, BH = Bloodhound, BI = Borzoi, BOT = Boston Terrier, BDF = Bouvier des Flandres, BD = Briard, BY = Brittany, CD = Canaan Dog, CED = Canadian Eskimo Dog, CC = Chinese Crested, CCR = Curly Coated Retriever, CWCW = Chow Chow, CBS = Clumber Spaniel, CS = Collie (Smooth), CSD = Catalan Sheepdog, CDT = Coton de Tulear, CSA = Cocker Spaniel (American), CBR = Chesapeake Bay Retriever, DDT = Dandie Dinmont Terrier, DH = Deerhound, ES = English Setter, EMD = Estrela Mountain Dog, EBMD = Entlebucher Mountain Dog, FH = Foxhound, FL = Finnish Lapphund, FS = Finnish Spitz, FTS = Fox Terrier (Smooth), FTW = Fox Terrier (Wire), FB = French Bulldog, FSL = Field Spaniel, GB = Griffon Bruxellois, GBDG = Grand Bleu de Gacogne, GS = Giant Schnauzer, GST = Gordon Setter, GP = German Pinscher, GWP = German Wirehaired Pointer, GLP = German Longhaired Pointer, GIT = Glen of Imaal Terrier, GSMD = Greater Swiss Mountain Dog, GH = Greyhound, HE = Havanese, HK = Hungarian Kuvasz, HP = Hungarian Puli, HT = Hovawart, IH = Ibizan Hound, IGH = Italian Greyhound, IT = Irish Terrier, IW = Irish Wolfhound, IRWS = Irish Red & White Setter, IS = Italian Spinone, IWS = Irish Water Spaniel, JAI = Japanese Akita Inu, JC = Japanese Chin, JSI = Japanese Shiba Inu, JS = Japanese Spitz, KBT = Kerry Blue Terrier, KHE = Kooikerhondje, KCS = King Charles Spaniel, KH = Keeshond, KJ = Korean Jindo, LBR = Leonberger, LLD = Lowchen (Little Lion Dog), LH = Lancashire Heeler, LM = Large Munsterlander, LT = Lakeland Terrier, LR = Lagotto Romagnolo, MF = Mastiff, ME = Maltese, MT = Manchester Terrier, MP = Miniature Pinscher, MBT = Miniature Bull Terrier, MH = Mexican Hairless, NFL = Newfoundland, NEH = Norwegian Elkhound, NBH = Norwegian Buhund, NSDT = Nova Scotia Duck Tolling Retriever, NMF = Neapolitan Mastiff, NT = Norfolk Terrier, NWT = Norwich Terrier, OES = Old English Sheepdog, OH = Otterhound, PH = Pharaoh Hound, PRT = Parson Russell Terrier, PWD = Portuguese Water Dog, PDO = Portuguese Podenco, PLS = Polish Lowland Sheepdog, PMD = Pyrenean Mountain Dog, PN = Papillon, POM = Pomeranian, PKE = Pekingese, PR = Pointer, PSD = Pyrenean Sheepdog, RBT = Russian Black Terrier, SCWT = Soft-Coated Wheaten Terrier, SL = Swedish Lapphund, SB = Saint Bernard, SD = Samoyed, SI = Sloughi, SKI = Saluki, SKE = Schipperke, ST = Sealyham Terrier, SKY = Skye Terrier, SS = Sussex Spaniel, SWD = Spanish Water Dog, SZR = Schnauzer, TS = Tibetan Spaniel, TM = Tibetan Mastiff, WCC = Welsh Corgi (Cardigan), WCP = Welsh Corgi (Pembroke), WSS = Welsh Springer Spaniel, WT = Welsh Terrier); Inheritance, the mode of inheritance (if known); DNA test, DNA test developed and available for screening schemes; Related Disorders, any related or associated disorders; References, numbered with brief citation at the end the table (full citations in references). The web-based database “Inherited Diseases in Dogs” (Sargan, D. R. 2004. IDID: inherited diseases in dogs: web-based information for canine inherited disease genetics. *Mammalian Genome*, 15(6), 503-506. <http://www.vet.cam.ac.uk/idid>) and Breed Predispositions to Disease in Dogs and Cats (Gough, A., Thomas, A. 2011. John Wiley & Sons) were used as resources.

(NOTE: This is not an exhaustive list of all inherited disorders in pedigree dogs and new DNA disease tests are continuously being developed)

Organ system	Condition	Breed	Group	Inheritance	Age of onset	DNA test	Related disorders	References
Behavioural	Interdog dominance aggression	HT	WORKING	Unknown	-	No		246
Behavioural	Aggressive temperament	JSI	UTILITY	Unknown	-	No		400

Organ system	Condition	Breed	Group	Inheritance	Age of onset	DNA test	Related disorders	References
Behavioural	Nervousness	PR	GUNDOG	Unknown (strong line inheritance)	-	-		350, 520
Behavioural	Unpredictable behavioural changes	BSM	PASTORAL	Unknown	-	No	Seizures	453
Cardiovascular	Haemophilia (A and/or B)	AT AS BJI BY CWCW FTW FB GWP PMD ME MT OES WCP PWD JSI SB ST POM CSA	TERRIER PASTORAL HOUND GUNDOG UTILITY TERRIER UTILITY GUNDOG PASTORAL TOY TERRIER PASTORAL PASTORAL WORKING UTILITY WORKING TERRIER TOY GUNDOG	X-linked recessive	- - - - - - - - - - - - - - - - - - - -	Yes - - - - - - - - - - - - - - - - - Yes -		30, 31, 192, 222, 319, 351, 411
Cardiovascular	von Williebrand disease (Type 1, 2, and 3)	AT BMD GH IW KBT GWP KHE MT PN WCP SZR CBR	TERRIER WORKING HOUND HOUND TERRIER GUNDOG GUNDOG TERRIER TOY PASTORAL UTILITY GUNDOG	Unknown Autosomal recessive Unknown Auto. rec. (suggested) Autosomal recessive Autosomal recessive Autosomal recessive Auto. rec. (suggested) Unknown Autosomal dominant Unknown Autosomal recessive	- - - - - - - - - - - -	- Yes - - Yes Yes Yes Yes Yes Yes - -		30, 32, 114, 205, 274, 365
Cardiovascular	Factor I (Fibrinogen) deficiency (hypofibrinogenemia)	BMD BI SB	WORKING HOUND WORKING	Auto. rec. (probable) Auto. rec. (probable) Familial, unknown	- - -	- - -		30, 107, 375

Organ system	Condition	Breed	Group	Inheritance	Age of onset	DNA test	Related disorders	References
Cardiovascular	Factor VII (plasma protein) deficiency	BMD	WORKING	Auto. rec. (probable)	-	-		30
Cardiovascular	Factor XI (Plasma thromboplastin antecedent)	PMD KBT	PASTORAL TERRIER	Autosomal recessive Autosomal recessive	- -	- Yes		30, 225, 267
Cardiovascular	Factor X (Stuart-Prower Factor) deficiency	CSA	GUNDOG	Autosomal dominant	<2 weeks	-		30
Cardiovascular	High K erythrocytes	KJ JSI	UTILITY UTILITY	Autosomal recessive Autosomal recessive	- -	- -		275, 397
Cardiovascular	Stomatocytosis	SZR	UTILITY	Familial	-	No	Anemia	391
Cardiovascular	Hyperlipidaemia	BY	GUNDOG	Familial	-	-		143
Cardiovascular	Postoperative haemorrhage	GSMD	WORKING	Familial	-	No		228
Cardiovascular	Wolman disease (Lipid storage disease)	FTS FTW	TERRIER TERRIER	Unknown Unknown	- -	- -	Intestinal mal absorption	184
Cardiovascular	Patent ductus arteriosus	WCC KH ME AS WCP POM SKI CSA	PASTORAL UTILITY TOY PASTORAL PASTORAL TOY HOUND GUNDOG	Unknown Polygenic Breed at increased risk Breed at increased risk Familial, unknown Unknown Familial, unknown Unknown	- - - - - - - -	- - - - - - - -	Heart failure	149, 199, 264, 339, 352, 378, 501
Cardiovascular	Peripheral artery occlusive disease (femoral)	KCS	TOY	Unknown	-	-		271
Cardiovascular	Pharmacogenetic abnormality	GS	WORKING	Unknown	-	-		209
Cardiovascular	Sick sinus syndrome (Sinus node disease)	CSA	GUNDOG	Familial, unknown	7-10 years	-	Fibrosis of sinus node	412
Cardiovascular	Dilated cardiomyopathy (DCM)	EMD IW SB NFL OES DH NMF PWD	PASTORAL HOUND WORKING WORKING PASTORAL HOUND WORKING WORKING	Unknown Unknown Unknown Unknown Breed at increased risk Unknown Unknown Autosomal recessive	- Adult 5 years 5 years - - 5 years 2-30 weeks	No No No No No No No Yes	Other heart disease, atrial fibrillation, congestive heart failure	179, 255, 352, 358, 408, 506, 523

Organ system	Condition	Breed	Group	Inheritance	Age of onset	DNA test	Related disorders	References
		CSA AT	GUNDOG TERRIER	Unknown Familial (suspected)	- -	No No		
Cardiovascular	Glanzmann's Type I thrombasthenia	PMD OH	PASTORAL HOUND	Unknown Autosomal recessive	- -	- Yes		221, 330
Cardiovascular	Spitz dog thrombopathia	FS	HOUND	Unknown	-	Yes		494
Cardiovascular	Canine leukocyte adhesion deficiency (CLAD)	IRWS	GUNDOG	Unknown	-	Yes		251
Cardiovascular	Thrombocytopenia (immune mediated)	OES	PASTORAL	Unknown	-	-	Clotting problems	323
Cardiovascular	Thrombopathy (Delta storage pool defect)	CSA	GUNDOG	Familial, unknown	-	-		414
Cardiovascular	Persistent right aortic arch	GP GH	WORKING HOUND	Familial Familial	- -	No		204, 236
Cardiovascular	Aortic aneurysm	LBR	WORKING	Familial	-	-	Twisting ascending aorta, dilation of thoracic arteries	285
Cardiovascular	Conotruncal defect (Cardiac malformation)	KH	UTILITY	Autosomal recessive	-	-		261
Cardiovascular	Ventricular septal defect	GP	WORKING	Unknown	Neonatal	No		199
Cardiovascular	Atrial septal defect	SD	PASTORAL	Familial, unknown	-	-		387
Cardiovascular	Cardiac valvular defects	CSA	GUNDOG	Unknown	-	-	Heart murmur	158
Cardiovascular	Mitral valve disease (left atrio-v, myxomatous, chronic valvular)	KCS ME PKE	TOY TOY TOY	Polygenic Breed at increased risk Breed at increased risk	5 years - -	- No -	Heart murmur	270, 293
Cardiovascular	Tricuspid valve dysplasia (right atrio-ventricular)	MF PMD	WORKING PASTORAL	Unknown Breed at increased risk	- -	- -		158, 496
Cardiovascular	Mitral stenosis	NFL	WORKING	Autosomal dominant	-	-	Heart failure	305
Cardiovascular	Pulmonic stenosis	CWCW FTS FTW FB SD SZR MF	UTILITY TERRIER TERRIER UTILITY PASTORAL UTILITY WORKING	Unknown Polygenic (suspected) Unknown Unknown Polygenic (suspected) Unknown Polygenic (suggested)	- - - - - - -	- - - - - No -	Abnormal cardiac rhythms and/or abnormalities, congestive heart failure	158, 189, 199, 384, 484, 485

Organ system	Condition	Breed	Group	Inheritance	Age of onset	DNA test	Related disorders	References
Cardiovascular	Subaortic stenosis	NFL	WORKING	Autosomal dominant	3-12 months	-	Heart murmur	300
Cardiovascular	Tetralogy of Fallot	FTW KH	TERRIER UTILITY	Congenital, rare Breed at increased risk	- -	- -		496, 502
Cardiovascular	Macrothrombocytopenia	NT	TERRIER	Familial, unknown	10-12 months	No		311
Endocrine	Portosystemic shunt	ACD IW DDT HE ME OES DH AST	PASTORAL HOUND TERRIER TOY TOY PASTORAL HOUND TOY	Breed at increased risk Unknown Breed at increased risk Breed at increased risk Breed at increased risk Unknown Polygenic (suspected) Breed at increased risk	< 1 year - < 1 year < 1 year < 1 year < 1 year < 1 year < 1 year	No	Hepatic encephalitis	44-46, 171, 327
Endocrine	Hypoadrenocorticism (Addison's disease)	BC PWD LBR SCWT NSDT	PASTORAL WORKING WORKING TERRIER GUNDOG	Unknown Autosomal recessive Familial Unknown Autosomal recessive	4 years 4-5 years - 4 years 2-3 years	- - - - No	Azotemia, hyperphosphatemia, hyperkalemia	93, 318, 283, 360, 404, 430
Endocrine	Hyperadrenocorticism (Cushing's-like syndrome) (Pituitary dependent and non)	CWCW DDT POM SD BOT AS	UTILITY TERRIER TOY PASTORAL UTILITY PASTORAL	Unknown Familial Unknown Unknown Breed at increased risk Breed at increased risk	- 10 years - - 10 years 10 years	- - - - - -	Partial adrenal dysfunction, alopecia (alopecia X)	162, 169, 355, 386, 463, 475
Endocrine	Copper toxicosis	BT SKY	TERRIER TERRIER	Autosomal recessive Familial, unknown	12 months -	Yes -	Anorexia, seizures, portosystemic shunt	97, 98, 401
Endocrine	Sodium thiopental sensitivity (Thiopental pharmacokinetics)	GH IGH	HOUND TOY	Unknown Breed at increased risk	- -	No		238
Endocrine	Anaesthesia idiosyncrasies	GH	HOUND	Unknown	-	No		242
Endocrine	Diabetes mellitus	KH SD SL FS HP MP	UTILITY PASTORAL PASTORAL HOUND PASTORAL TOY	Autosomal recessive Familial Familial Breed at increased risk Breed at increased risk Breed at increased risk	<6 months 7-9 years 7 years - 7-9 years 4-14 years	- - - - - -	Hyperglycaemia, glucosuria	380, 381, 428, 430, 492, 529

Organ system	Condition	Breed	Group	Inheritance	Age of onset	DNA test	Related disorders	References
		AUT	TERRIER	Familial	4-7 years	-		
Endocrine	Lymphocytic thyroiditis (primary hypothyroidism)	BI ES GS GH HT AT POM AH PR SKY	HOUND GUNDOG WORKING HOUND WORKING TERRIER TOY HOUND GUNDOG TERRIER	Autosomal recessive Unknown Breed at increased risk Unknown Breed at increased risk Breed at increased risk Breed at increased risk Breed at increased risk Breed at increased risk Breed at increased risk	2 years - 2-3 years - 3-7 years 2-3 years 2-3 years 2-3 years - -	- - - No - - - - - -	Obesity, hair loss	124, 176, 207, 212, 239, 247
Endocrine	Hyperparathyroidism (Primary, PHPT)	KH	UTILITY	Autosomal dominant	>7 years	Yes	Hypercalcaemia, parathyroid adenoma	263
Endocrine	Hypoparathyroidism (Primary)	SB	WORKING	Breed at increased risk	Any age	-		522
Endocrine	Growth hormone-responsive dermatosis	CWCW KH POM SD AWS	UTILITY UTILITY TOY PASTORAL GUNDOG	Unknown Breed at increased risk Breed at increased risk Breed at increased risk Breed at increased risk	1-2 years	- - - - -		480
Gastrointestinal	Ivermectin sensitivity	AS LT OES	PASTORAL TERRIER PASTORAL	Autosomal recessive Unknown Autosomal recessive	- - -	Yes No No	Gastrointestinal tract toxicosis, blindness, gait deficit (hind limb ataxia)	69, 70, 276, 329
Gastrointestinal	Immunoproliferative enteropathy	BJI	HOUND	Familial, presumed autoimmune	<3 years	-		76-78
Gastrointestinal	Gastric carcinoma	BST	PASTORAL	Unknown	9 years	No		104
Gastrointestinal	Congenital megaesophagus	FTW FTS	TERRIER TERRIER	Autosomal recessive	- -	- -	Myasthenia gravis	185
Gastrointestinal	Exocrine pancreatic insufficiency	CWCW ES	UTILITY GUNDOG	Unknown Familial	- Juvenile	No	Diabetes	164, 174
Gastrointestinal	Taurine deficiency	NFL	WORKING	Familial	-	-	Cardiomyopathy	306
Gastrointestinal	Ulcerative colitis (Histiocytic inflammatory bowel disease)	FB	UTILITY	Unknown	-	-	Brachycephalic respiratory syndrome	194

Organ system	Condition	Breed	Group	Inheritance	Age of onset	DNA test	Related disorders	References
Gastrointestinal	Haemorrhagic gastroenteritis	KCS PKE	TOY TOY	Breed at increased risk Breed at increased risk	> 5 years 5-7 years	- -		504
Gastrointestinal	Chronic hepatitis	CSA	GUNDOG	Breed at increased risk	-	-		524
Gastrointestinal	Protein losing enteropathy (PLE)	SCWT	TERRIER	Familial, unknown	4-6 years	-	Inflammatory bowel disease	406
Gastrointestinal	Pancreatic acinar atrophy	GH	HOUND	Familial	-	No		240
Gastrointestinal	Antral pyloric hypertrophy (Pyloric stenosis)	BOT ME PKE	UTILITY TOY TOY	Congenital Congenital Breed at increased risk	6-12 months - Adult	- - -		464, 465, 514
Gastrointestinal	Gastric dilation (volvulus)	BH BI GST IW SB NMF OH GBDG GLP	HOUND HOUND GUNDOG HOUND WORKING WORKING HOUND HOUND GUNDOG	Familial, unknown Breed at increased risk Familial, unknown Familial, unknown Breed at increased risk Breed at increased risk Breed at increased risk Breed at increased risk Breed at increased risk	Adult-elderly	- - - - - No No - -		121, 215
Gastrointestinal	Imerslund-Grasbeck syndrome (Cobalamin malabsorption)	GS AS	WORKING PASTORAL	Autosomal recessive -	6-12 weeks -	Yes Yes		207, 439
Gastrointestinal	Cleft palate	BOT BY PSD	UTILITY GUNDOG PASTORAL	Autosomal recessive	Birth	No		127, 140, 363
Immune	Complement (C3) deficiency	BY	GUNDOG	Autosomal recessive	-	-	Spinal muscular atrophy	141
Immune	Severe combined immunodeficiency (SCID)	WCC	PASTORAL	X-linked recessive	-	Yes		148
Immune	Autoimmune disorders (multiple involving glandular tissues)	IGH	TOY	Increased risk in case series	Adult	No	Adrenals, thyroid, pancreas, gonads and skin affected	243
Immune	Haemolytic anaemia (auto-immune, AIHA; immune-mediated, IMHA)	CSA FS OES MP	GUNDOG HOUND PASTORAL TOY	Unknown Breed at increased risk Breed at increased risk Unknown	Adult Adult 5-6 years 1-7 years	No	Bilirubinaemia, other autoimmune disease(s)	416, 459, 493

Organ system	Condition	Breed	Group	Inheritance	Age of onset	DNA test	Related disorders	References
Integument	Alopecia (Alopecia X, colour dilution alopecia, seasonal flank alopecia)	AP AT CWCW GP KH MP POM CBR CCR SD SZR IWS BMD GH NFL SKI SKE AST	TOY TERRIER UTILITY WORKING UTILITY TOY TOY GUNDOG GUNDOG PASTORAL UTILITY GUNDOG WORKING HOUND WORKING HOUND UTILITY TOY	Familial Breed at increased risk X-linked (suggested) Unknown X-linked (suggested) Unknown X-linked (suggested) Unknown Familial, unknown X-linked (suggested) Unknown Autosomal dominant - - Unknown - - -	2-5 years 2-4 years <1 year 6 mo-2 years <1 year 6 mo-2 years - 5 mo-4 years 1 year - 6 mo-2 years 2-5 years - - - 18 months - - -	No - - - - - No No - - No - - - - - - -	Hyperadrenocorticism	2, 26, 162, 203, 266, 356, 366, 368, 419, 462
Integument	Follicular dysplasia (including Black hair)	BC GST LM SKI CCR IWS PWD PN PR SKE CSA	PASTORAL GUNDOG GUNDOG HOUND GUNDOG WORKING TOY GUNDOG UTILITY GUNDOG	Autosomal recessive Familial Auto. rec. (suspected) Auto. rec. (suspected) Unknown - Unknown Familial Familial Auto. rec. (suspected) Familial	4 weeks - 2-4 years 4 weeks 2-4 years - 2-5 years < 1 year 1-2 years < 1 year < 1 month	- - Yes - - - - - - - -	Deafness, onychodystrophy, SLO	90, 91, 94, 282, 379, 462, 450
Integument	Pattern baldness	BOT GH IGH MT PWD AWS	UTILITY HOUND TOY TERRIER WORKING GUNDOG	Unknown	6 months 6 months 6 months 6 months 6 months 6 months	- - - - - -		450, 461, 462
Integument	Sebaceous adenitis	JAI SD	UTILITY PASTORAL	Unknown	- -	- -		462





Organ system	Condition	Breed	Group	Inheritance	Age of onset	DNA test	Related disorders	References
		PKE CBR SCWT AUT	TOY GUNDOG TERRIER TERRIER	Breed at increased risk Breed at increased risk Breed at increased risk Breed at increased risk	9-11 years 9 years 8 years 8 years			
Integument	Chemodectoma	BOT	UTILITY	Breed at increased risk	Elderly	-		467
Integument	Malignant Pilomatricoma	AT KBT OES SCWT BDF SZR	TERRIER TERRIER PASTORAL TERRIER WORKING UTILITY	Increased risk in case series	6 years - - - - -	- - - - -		443
Integument	Histiocytosis	BMD	WORKING	Polygenic (suggested)	3-4 years	-		456
Integument	Mast cell tumor	ACD BOT ES FTS	PASTORAL UTILITY GUNDOG TERRIER	Breed at increased risk	4 months - 4 months 4 months	- - - -		33, 95, 431, 448
Integument	Chronic superficial keratitis (pannus)	BST GH AS	PASTORAL HOUND PASTORAL	Breed at increased risk Auto. rec. (suspected) Breed at increased risk	4-7 years 2 years 4-7 years	- - -		229, 454
Integument	Trichoblastoma (basal cell tumors)	BC FS HP KBT SCWT WSS	PASTORAL HOUND PASTORAL TERRIER TERRIER GUNDOG	Breed at increased risk	7 years 8 years > 5 years 5-7 years 7-9 years > 5 years	- - - - - -		431
Integument	Perianal (hepatoid) gland adenoma	BY PKE SD	GUNDOG TOY PASTORAL	Breed at increased risk	10 years	- - -		431
Integument	Pemphigus foliaceus	BC CWCW NFL SKE FS	PASTORAL UTILITY WORKING UTILITY HOUND	Breed at increased risk Unknown Breed at increased risk Breed at increased risk Breed at increased risk	4 years - 3 months 3 months -	- - - - -	Alopecia, peripheral collarettes, footpad lesions, cracking, dermatitis	92, 159
Integument	Familial chronic pemphigus (epidermal acantholysis)	ES	GUNDOG	Autosomal dominant	-	-		490

Organ system	Condition	Breed	Group	Inheritance	Age of onset	DNA test	Related disorders	References
Integument	Pyoderma/furunculosis (Muzzle folliculitis)	MF	WORKING	Breed at increased risk	-	-		486
Integument	Palmoplantar hyperkeratosis	IT	TERRIER	Autosomal recessive	6 months	-		254
Integument	Seborrhoea	CSA	GUNDOG	Auto. rec. (probable)	1 year	-	Secondary bacterial infections	415, 450
Integument	Symmetrical lupoid onychodystrophy (SLO)	BC GS GST	PASTORAL WORKING GUNDOG	Familial	- - -	No	Autoimmune dermatitis, alopecia, black hair follicular dysplasia	94, 217
Integument	Histoplasmosis	BY	GUNDOG	Breed at increased risk	< 2 years	-		440
Integument	Epidermolysis bullosa (dystrophic & junctional)	BN	WORKING	Autosomal recessive	-	-	Crusted papules, erosions in genital region	95, 450
Integument	Vitiligo	BST	PASTORAL	Unknown	Juvenile	-	Autoimmune disorders	103
Integument	Multiple cancer syndrome	ES	GUNDOG	Unknown	-	No		177
Integument	Dermoid sinus	CWCW	UTILITY	Unknown	-	-		160
Integument	Ocular dermoid cysts	SB	WORKING	Unknown	-	No		265, 373, 423
Integument	Demodex injai infestation	FTW	TERRIER	Familial	-	-	Hypothyroidism	190
Integument	Cutaneous vasculopathy	GH	HOUND	Unknown	-	-		234
Integument	Epidermal hyperkeratosis (Keratinization defect)	NT	TERRIER	Autosomal recessive	Birth	-		310
Integument	Ectopic cilia	PKE	TOY	Breed at increased risk	-	-		265, 515
Integument	Entropion (and/or Ectropion)	BH AT BT BMD BDF CWCW MF ES FB PMD IW	HOUND TERRIER TERRIER WORKING WORKING UTILITY WORKING GUNDOG UTILITY PASTORAL HOUND	Polygenic (suspected)	- - - - - 2-6 weeks - - - - -	No - - - - - - - - - -	Ectropin, damage to conjunctiva, macroblepharon	123, 423, 265, 488

Organ system	Condition	Breed	Group	Inheritance	Age of onset	DNA test	Related disorders	References
		KBT LBR NFL NEH PKE POM CBR CCR SB CSA CBS WSS MBT JC	TERRIER WORKING WORKING HOUND TOY TOY GUNDOG GUNDOG WORKING GUNDOG GUNDOG GUNDOG TERRIER TOY		- - - - - - - - - - - - - -	- - - - - - - - - - - - - -		
Integument	Trichiasis (caruncular)	BOT	UTILITY	Breed at increased risk	-	-		423
Integument	Distichiasis	FB HE PKE CSA	UTILITY TOY TOY GUNDOG	Breed at increased risk	- - - -	- - - -	Entropion	265, 423, 525
Integument	Cornifying epithelioma (keratoacanthoma)	NEH BC BT KH KBT PKE SD SCWT	HOUND PASTORAL TERRIER UTILITY TERRIER TOY PASTORAL TERRIER	Breed at increased risk	7 years	- - - - - - - -		313, 431, 451, 503
Musculoskeletal	Legg-Calve Perthe disease	AP AS MT MP	TOY PASTORAL TERRIER TOY	Increased risk in case series (familial) Autosomal recessive Unknown	4-12 months 4-12 months 4-12 months -	- - - -		3, 64, 163, 294
Musculoskeletal	Elbow deformity (elbow incongruity)	AH NFL SKY	HOUND WORKING TERRIER	Familial Unknown Autosomal recessive	- - -	- - -	Ununited anconal processes	23, 303, 402
Musculoskeletal	Congenital elbow luxation	BC BOT OES PKE	PASTORAL UTILITY PASTORAL TOY	Unknown	4-5 months < 3 months 4-5 months 4-5 months	- - - -		449

Organ system	Condition	Breed	Group	Inheritance	Age of onset	DNA test	Related disorders	References
		MP POM	TOY TOY	Unknown, uncommon	< 3 months 4-5 months	- -		
Musculoskeletal	Inherited polyneuropathy	GH LBR	HOUND WORKING	Autosomal recessive X-linked recessive	- 1-9 years	Yes No	Ataxia, exercise intolerance, distal limb atrophy, dyspnea	241, 284
Musculoskeletal	Ankyloglossia (tied tongue)	ASD	PASTORAL	Familial, X-linked	-	-		39
Musculoskeletal	GM1 gangliosidosis	PWD JSI	WORKING UTILITY	Autosomal recessive Autosomal recessive	2 months 5 months	Yes	Neurological impairment, ataxia	359, 398
Musculoskeletal	Myasthenia gravis	FTS FTW NFL	TERRIER TERRIER WORKING	Autosomal recessive Autosomal recessive Familial, unknown	5 weeks 5 weeks 5-8 weeks	- - -	Muscular weakness	185, 307, 437
Musculoskeletal	Mitochondrial myopathy	OES SS CBS	PASTORAL GUNDOG GUNDOG	Unknown Unknown, rare Unknown, rare	- - -	- - -		324, 421, 429
Musculoskeletal	Nemaline rod myopathy	SKE	UTILITY	Unknown	Adult	-	Exercise intolerance	389
Musculoskeletal	Elbow dysplasia	ACD BSM BMD BH CWCW ES GST GSMD IW MF TM NFL SB BDF POM	PASTORAL PASTORAL WORKING HOUND UTILITY GUNDOG GUNDOG WORKING HOUND WORKING WORKING WORKING WORKING WORKING TOY	Polygenic - Males higher risk - Polygenic Polygenic Polygenic Polygenic Polygenic Polygenic Breed at increased risk Polygenic Breed at increased risk Unknown	- - - - - - - - - - - - - - -	- - - - - - - - - - - - - -	Osteochondrosis dissecans	47, 64, 105, 153, 163, 304, 449
Musculoskeletal	Hip Dysplasia	BMD BH BDF BD BY CWCW ES	WORKING HOUND WORKING PASTORAL GUNDOG UTILITY GUNDOG	Polygenic Unknown Unknown Unknown Unknown Unknown Unknown	- - - - - - -	No	Gait problems, exercise intolerance	64, 122, 134, 163, 178, 224, 206, 249, 288, 331, 420, 455, 481

Organ system	Condition	Breed	Group	Inheritance	Age of onset	DNA test	Related disorders	References
		EMD	PASTORAL	Unknown	-			
		GS	WORKING	Unknown	-			
		JAI	UTILITY	Unknown	-			
		GST	GUNDOG	Unknown	-			
		SD	PASTORAL	Unknown	-			
		HK	PASTORAL	Unknown	-			
		AT	TERRIER	Unknown	-			
		BS	PASTORAL	Unknown	-			
		CBR	GUNDOG	Unknown	-			
		GWP	GUNDOG	Unknown	-			
		PMD	PASTORAL	Unknown	-			
		KH	UTILITY	Unknown	-			
		MF	WORKING	Unknown	-			
		NMF	WORKING	Unknown	-			
		NFL	WORKING	Unknown	12-18 months			
		NEH	HOUND	Unknown	-			
		OES	PASTORAL	Unknown	-			
		PWD	WORKING	Unknown	-			
		SB	WORKING	Unknown	-			
		HP	PASTORAL	Unknown	-			
		LBR	WORKING	Unknown	12-18 months			
		IW	HOUND	Unknown	12-18 months			
		OH	HOUND	Unknown	-			
		CBS	GUNDOG	Unknown	-			
		SZR	UTILITY	Unknown	-			
		IWS	GUNDOG	Unknown	-			
		SS	GUNDOG	Unknown	-			
		WSS	GUNDOG	Unknown	-			
		BC	PASTORAL	Unknown	-			
Musculoskeletal	Oculo-skeletal dysplasia (short-limbed dwarfism)	SD	PASTORAL	Autosomal recessive	-	Yes	Elbow and carpel deformity, cataracts, retinal detachment	383
Musculoskeletal	Panosteitis (Enostosis, eosinophilic)	CWCW	UTILITY	Breed at increased risk	Juvenile	-		64
		MF	WORKING			-		
		AH	HOUND			-		
		BMD	WORKING			-		
		CBR	GUNDOG			-		
		ES	GUNDOG			-		
		GS	WORKING			-		

Organ system	Condition	Breed	Group	Inheritance	Age of onset	DNA test	Related disorders	References
		PMD IW NMF NFL SB	PASTORAL HOUND WORKING WORKING WORKING			- - - - -		
Musculoskeletal	Temporomandibular joint dystrophy	CSA	GUNDOG	Unknown	6 months	No		417
Musculoskeletal	Myotonic myopathy (Myotonia)	ACD CWCW	PASTORAL UTILITY	Autosomal recessive	- 12 weeks	Yes -	Abnormalities in skull development and dentition	56, 57, 156
Musculoskeletal	Polydactyly (skeletal malformations)	AS BMD PMD SB	PASTORAL WORKING PASTORAL WORKING	X-linked (suggested) Unknown Autosomal dominant Autosomal recessive	Birth	- - - -	Syndactyly, brachygnatism, cleft palate and lip, anotia, extra thoracic vertebra, rib	66, 67, 113, 224, 374
Musculoskeletal	Cranial cruciate ligament rupture	BMD NFL CWCW MF NMF CBR SB	WORKING WORKING UTILITY WORKING WORKING GUNDOG WORKING	Unknown Unknown Unknown Breed at increased risk Unknown Breed at increased risk Unknown	- >2 years Elderly Elderly - > 1 year Elderly	No		116, 308, 481, 507
Musculoskeletal	Pectus excavatum	WT	TERRIER	Unknown	-	-		436
Musculoskeletal	Patellar luxation (including medical patellar luxation, MPL)	CWCW POM ACD BOT CSA AST FTW PMD KH ME PN PKE MP AUT JC	UTILITY TOY PASTORAL UTILITY GUNDOG TERRIER TERRIER PASTORAL UTILITY TOY TOY TOY TOY TERRIER TOY	Unknown Unknown Unknown - Auto. rec. (suspected) - Breed at increased risk Unknown Unknown Unknown Unknown Unknown Unknown Unknown Breed at increased risk Breed at increased risk	8 weeks  - - - - - - - - - - - - - - - -	- - - - - - - - - - - - - - - - -		64, 163, 446, 447

Organ system	Condition	Breed	Group	Inheritance	Age of onset	DNA test	Related disorders	References
Musculoskeletal	Osteochondrosis dissecans (shoulder lameness)	ES LM BMD BDF MF GWP PMD HK IW NFL OES CBR SB	GUNDOG GUNDOG WORKING WORKING WORKING GUNDOG PASTORAL PASTORAL HOUND WORKING PASTORAL GUNDOG WORKING	Polygenic Breed at increased risk Polygenic Breed at increased risk Breed at increased risk Breed at increased risk Unknown Breed at increased risk Breed at increased risk Breed at increased risk Breed at increased risk Breed at increased risk Breed at increased risk	4-7 months 4-7 months - 4-7 months 4-7 months 4-7 months 4-7 months 4-7 months 4-7 months 4-7 months 4-7 months 4-7 months	- - - - - - - - - - - -		64, 175, 281, 508
Musculoskeletal	Malignant hyperthermia	GH	HOUND	Autosomal dominant	Birth	Yes		232
Musculoskeletal	X-linked myopathy	BGVG JS OES WCP	HOUND UTILITY PASTORAL PASTORAL	X-linked (assumed) X-linked recessive X-linked (assumed) Unknown	2 months - 6 months -	No	Exercise intolerance	87, 260, 328, 342
Musculoskeletal	Congenital (X-linked) myopathy (central core myopathy)	IT SD	TERRIER PASTORAL	X-linked recessive Unknown	- -	No	Cardiomyopathy	252, 253
Musculoskeletal	Chondrodysplasia (osteochondrodysplasia)	BGVP WCC WCP GIT PMD HE NFL NEH PKE DH	HOUND PASTORAL PASTORAL TERRIER PASTORAL TOY WORKING HOUND TOY HOUND	Dominant (in basset hound)  Autosomal recessive Autosomal recessive Autosomal recessive Autosomal recessive Unknown Autosomal recessive	- - - - - - - - - 4-5 weeks	No	Deafness, patellar luxation, abnormal hips, glucosuria	88, 219, 245, 309, 394
Musculoskeletal	Osteochondrosis (sacral)	MF	WORKING	Unknown	-	No		298
Musculoskeletal	Osteosarcoma (Osteogenic sarcoma)	GH IW LBR NFL MF	HOUND HOUND WORKING WORKING WORKING	Breed at increased risk in case series (familial)	Adult (middle age)	No	Lung metastasis	237, 287, 299, 372, 395



Organ system	Condition	Breed	Group	Inheritance	Age of onset	DNA test	Related disorders	References
		SB DH	WORKING HOUND	Auto. dom (suspected)				
Musculoskeletal	Cystic bone lesions	OES	PASTORAL	Familial, unknown	-	-		325
Musculoskeletal	Radial head subluxation	BDF	WORKING	Unknown	Birth	No	Skeletal deformities	138
Musculoskeletal	English Pointer Enchondrodystrophy	PR	GUNDOG	Autosomal recessive	6 weeks	-		348
Musculoskeletal	Hemivertebrae	FB PKE BOT	UTILITY TOY UTILITY	Familial Familial Unknown	- - -	- - -	Hind limb weakness	193, 469
Musculoskeletal	Intervertebral disc herniation	FB PKE	UTILITY TOY	Unknown Unknown	- <2 years	No -		195, 338
Musculoskeletal	Perineal hernia	BOT	UTILITY	Unknown	9 years	-		466
Musculoskeletal	Sacrocaudal dysgenesis	BOT	UTILITY	Congenital	-	-		470
Musculoskeletal	Hindlimb lameness	GH	HOUND	Autosomal dominant (presumed)	5 months	-		230
Musculoskeletal	Hypertonic myopathy (exercise induced hypertonia)	KCS	TOY	Unknown	-	-		269
Musculoskeletal	Pyruvate dehydrogenase phosphatase 1 deficiency (Exercise intolerance, Exercise induced collapse)	WCP CBR CCR CBS SS	PASTORAL GUNDOG GUNDOG GUNDOG	Autosomal recessive	- 1 year - 1 year 1 year	No Yes - Yes Yes	Cardiomyopathy, severe exercise intolerance	343, 418, 422
Musculoskeletal	Hereditary necrotizing myopathy	KHE	GUNDOG	Autosomal recessive	3-12 months	-	Malacia of spinal cord with Wallerian degeneration	272
Musculoskeletal	Periodontal disease	IGH	HOUND	Unknown	1-3 years	No		244
Musculoskeletal	Enamel hypoplasia	IGH	HOUND	Unknown	Juvenile	No	Periodontal disease	245
Musculoskeletal	Oligodontia	KBT	TERRIER	Familial	Juvenile	No		268
Musculoskeletal	Hereditary spinal muscular atrophy	BY PR	GUNDOG GUNDOG	Autosomal dominant Unknown	< 1 year 5 months	- -		142, 429
Musculoskeletal	Syringomyelia	GB	TOY	Polygenic	-	No		146

Organ system	Condition	Breed	Group	Inheritance	Age of onset	DNA test	Related disorders	References
Musculoskeletal	Mucopolysaccharidosis (Maroteaux-Lamy syndrome)	MP	TOY	Autosomal recessive	-	Yes	Facial dysmorphism, paralysis	345
Musculoskeletal	Glycogen storage disease (Pompe disease, all types)	FL ME CCR CSA SL	PASTORAL TOY GUNDOG GUNDOG PASTORAL	Mutation Autosomal recessive Autosomal recessive Autosomal recessive Mutation	- <2 months 2 months - -	- - Yes Yes No	Megaesophagus, exhaustion	181, 290, 369, 410
Nervous System	Lacrimal punctal atresia	BT	TERRIER	Unknown	-	-		452
Nervous System	Aniridia	CSD	PASTORAL	Unknown	-	No	Keratitis, cataract, glaucoma	426
Nervous System	Vitrear degeneration (Vitrear syneresis)	GH BOT IGH	HOUND UTILITY TOY	Breed at increased risk Breed at increased risk Familial, unknown	>7 years 3 years 2 years	- - -	Cataract, glaucoma	229, 423
Nervous System	Hereditary myelopathy (Afghan myelopathy)	AH	HOUND	Autosomal recessive	3-13 months	-	Demyelination and myelomalacia	13-16
Nervous System	Hypomyelinating neuropathy (Dysmyelination of the central nervous system)	BMD CWCW SD	WORKING UTILITY PASTORAL	Auto. rec. (suggested) Familial X-linked (suspected)	9 weeks Birth 2-8 weeks	- - -		110, 161, 385
Nervous System	Hypertrophic neuropathy	TM	WORKING	Autosomal recessive	8-10 weeks	-		296
Nervous System	Degenerative myelopathy	BMD PMD IH WCP CBR	WORKING PASTORAL HOUND PASTORAL GUNDOG	Autosomal recessive Unknown Autosomal recessive Autosomal recessive Autosomal recessive	8 years Adult Birth 11 years 5-13 years	Yes No - Yes Yes	Ataxia, hypermetria, seizures	27, 118, 226, 341, 367, 476
Nervous System	Neuroaxonal dystrophy (NAD)	GS PN	WORKING TOY	Autosomal recessive Familial, unknown	Birth 3 months	No -	Cerebellar hypoplasia, respiratory failure, tremor	210, 332
Nervous System	Cerebellar hypoplasia	FTW	TERRIER	Congenital, rare	2-3 weeks	-		498
Nervous System	Acral mutilation syndrome	PR	GUNDOG	Autosomal recessive	3-8 months	-		347
Nervous System	Hereditary sensory neuropathy	PR	GUNDOG	Autosomal recessive	3-6 months	-	Self mutilation (Acral mutilation)	518

Organ system	Condition	Breed	Group	Inheritance	Age of onset	DNA test	Related disorders	References
Nervous System	Lethal astrocytosis	GST	GUNDOG	Autosomal recessive	3-4 weeks	-		216
Nervous System	Motor neuron abiotrophy	SKI	HOUND	Unknown	9 weeks	-		377
Nervous System	Galactosialidosis (Lysosomal storage disease)	SKE	UTILITY	Unknown	5 years	-		388
Nervous System	Mucopolysaccharidosis IIIB (Sanfilippo syndrome IIIB)	SKE	UTILITY	Autosomal recessive	3 years	Yes	Cerebellar atrophy	390
Nervous System	Cerebellar cortical abiotrophies	AT BMH CWCW LR PDO	TERRIER HOUND UTILITY GUNDOG HOUND	Unknown Unknown Unknown Unknown Auto. rec. (suspected)	- - - - 2-3 weeks	No	Cerebellar hypoplasia, ataxia, tremors	27, 28, 89, 279, 521
Nervous System	Cerebellar ataxia	BSM CC CDT IS KBT	PASTORAL TOY TOY GUNDOG TERRIER	Autosomal recessive	8 weeks 3-4 months 2 weeks 5 months 3-4 months	No - - -		101, 151, 150, 258
Nervous System	Hereditary ataxia	FTS	TERRIER	Autosomal recessive	2-6 months	-	Myelopathy	186, 191
Nervous System	Hound ataxia	FH	HOUND	Unknown	2-7 years	-		495
Nervous System	Spinocerebellar degeneration	BY PRT	GUNDOG TERRIER	Autosomal dominant Autosomal recessive	6-7 years 6-12 months	- Yes	Ataxia, tremors, hind limb hypermetria	144, 334
Nervous System	Cerebellar degeneration	CDT GST OES	TOY GUNDOG PASTORAL	Unknown Autosomal recessive Autosomal recessive	8 weeks 6-24 months Adult-Elderly	- - -	Autoimmune deficiencies, hypermetria, ataxia	165, 214, 326
Nervous System	Canine multiple system degeneration (CMSD)	CC KBT	TOY TERRIER	Autosomal recessive Autosomal recessive	- 3-6 months	- -		151
Nervous System	Lissencephaly	FTW	TERRIER	Unknown, rare	< 1 year	-		498
Nervous System	Meningoencephalitis	GH	HOUND	Unknown	4-18 months	-	Ataxia, blindness	235

Organ system	Condition	Breed	Group	Inheritance	Age of onset	DNA test	Related disorders	References
Nervous System	Polioencephalomyelopathy	ACD	PASTORAL	Maternal, mitochondrial	5-6 months	-	Hypertrophy of astrocytes	50-52
Nervous System	Degenerative encephalomyelopathy	HK	PASTORAL	Familial	-	No	Ataxia	248
Nervous System	Necrotizing encephalitis	ME	TOY	Familial, unknown	>9 months	-	Ataxia, depression, generalized seizures	292
Nervous System	Australian Stumpy Tailed Cattle Dog	ACD	PASTORAL	Associated with coat colour and speckling	-	No	Deafness (unilateral or bilateral)	59
Nervous System	Hepatocerebellar degeneration	BMD	WORKING	Autosomal recessive	1-2 months	-	Ataxia, head tremors	109
Nervous System	Hydrocephalus (Dandy Walker-like syndrome)	BOT	UTILITY	Congenital	< 3 months	-		468
Nervous System	White/Grey matter spongy degeneration	AST SKI	TOY HOUND	Autosomal recessive Unknown	- -	- -	Tremor, ataxia	27
Nervous System	Malonic acidurea	ME	TOY	Autosomal recessive (probable)	3 years	-	Hypoglucaemia, acidosis	291
Nervous System	Generalized tremors	ME	TOY	Familial	< 5 years	-		292
Nervous System	Intradural vasculitis	WSS	GUNDOG	Familial	-	-	Ataxia and pyrexia, necrotizing arthritis	425
Nervous System	Microphthalmia (and/or Coloboma)	AS SB SCWT BJI KCS NT	PASTORAL WORKING TERRIER HOUND TOY TERRIER	Autosomal recessive Familial, unknown Unknown Unknown Auto. rec. (suspected) Unknown	- - - - - -	- - - - - -	Retinal dysplasia, cataract, persistent pupillary membranes	65, 371, 405, 423
Nervous System	Deafness (sensorial, sensorineural, congenital deafness with suspected inheritance, Schiebe's type deafness)	FH ACD ES PMD GH BI AS BOT WCC	HOUND PASTORAL GUNDOG PASTORAL HOUND HOUND PASTORAL TERRIER PASTORAL	Incomplete dominant Unknown Familial Unknown Familial (coat colour) Unknown Unknown Unknown Unknown	- 4 weeks 6 weeks 4 weeks - - - - -	Yes	Often syndromic deafness, microphthalmia and other eye defects, impairment of sperm function	34-38, 54, 220, 322, 349, 350

Organ system	Condition	Breed	Group	Inheritance	Age of onset	DNA test	Related disorders	References
		CC	TOY	Unknown	-			
		CWCW	UTILITY	Unknown	-			
		CDT	TOY	Unknown	-			
		FB	UTILITY	Unknown	-			
		HE	TOY	Unknown	-			
		IH	HOUND	Unknown	-			
		IGH	HOUND	Unknown	-			
		KH	PASTORAL	Unknown	-			
		LLD	TOY	Unknown	-			
		ME	TOY	Unknown	< 4 months			
		NSDT	GUNDOG	Unknown	-			
		OES	PASTORAL	Incomplete dominant	-			
		PN	TOY	Unknown	-			
		HP	PASTORAL	Unknown	-			
		SB	WORKING	Unknown	-			
		SD	PASTORAL	Familial, unknown	-			
		ST	TERRIER	Unknown	-			
		SS	GUNDOG	Unknown	-			
		TS	UTILITY	Unknown	-			
		PR	GUNDOG	Autosomal recessive	-			
		HK	PASTORAL	Unknown	-			
		MP	TOY	Unknown	-			
		SZR	UTILITY	Unknown	-			
		SCWT	TERRIER	Unknown	-			
		ASD	PASTORAL	Unknown	-			
Nervous System	Leukodystrophy	ACD	PASTORAL	Familial, mitochondrial transmission	2-9 weeks	No	Ataxia, paresis, paralysis, spasticity, cranial nerve dysfunction	52, 58
Nervous System	Alexander Disease (progressive paralysis and dementia)	BMD	WORKING	Unknown	9 weeks	-	Demyelination	112

Organ system	Condition	Breed	Group	Inheritance	Age of onset	DNA test	Related disorders	References
Nervous System	Epilepsy (Grand mal seizures, idiopathic epilepsy)	AS	PASTORAL	Breed at increased risk	6 months	No	Ataxia, crawling, swaying, fearful behaviour, disorientation	68, 102, 106, 145, 182, 227, 257, 259, 262, 280, 354, 438
		BST	PASTORAL	Single locus	6 mo-6 years	-		
		BMD	WORKING	Polygenic recessive	1-3 years	-		
		BY	GUNDOG	Unknown	-	-		
		CD	UTILITY	Unknown	-	-		
		FS	HOUND	Unknown	-	-		
		GS	WORKING	Unknown	-	-		
		PMD	PASTORAL	Unknown	-	-		
		GSMD	WORKING	Unknown	-	-		
		IGH	TOY	Unknown	-	-		
		WSS	GUNDOG	Unknown	-	-		
		IW	HOUND	Autosomal recessive	3 years	-		
		IS	GUNDOG	Unknown	-	-		
		KH	UTILITY	Autosomal recessive	>12 months	-		
		LR	GUNDOG	Familial	5-9 weeks	Yes		
		POM	TOY	Unknown	-	-		
		SB	WORKING	Unknown	6 mo- 6 years	-		
SZR	UTILITY	Unknown	-	-				
FTW	TERRIER	Unknown	6 mo- 6 years	-				
PR	GUNDOG	Breed at increased risk	-	-				
Ocular	Cataract (early and late onset)	AH	HOUND	Autosomal recessive	4 months	No	- Microphthalmia (merle dogs)  Associated with PHTVL	9, 10, 71, 96, 119, 126, 152, 187, 202, 250, 286, 312, 320, 364, 370, 409, 423, 432, 531
		AS	PASTORAL	Mutation	-	Yes		
		BC	PASTORAL	Unknown	2-5 years	-		
		BT	TERRIER	Autosomal recessive	2 months	-		
		BST	PASTORAL	Autosomal recessive	2 years	-		
		RBT	TERRIER	Unknown	-	-		
		BOT	UTILITY	Autosomal recessive	8 wks, 5 yrs	-		
		CWCW	UTILITY	Familial	-	-		
		FTS	TERRIER	Unknown	-	-		
		FTW	TERRIER	Unknown	3 years	-		
		BP	WORKING	Autosomal recessive	-	-		
		HE	TOY	Breed at increased risk	-	-		
		IH	HOUND	Autosomal recessive	7 months	-		
		IRWS	GUNDOG	Auto. dom (suspected)	-	-		
		GS	WORKING	Unknown	6-7 years	-		
		LBR	WORKING	Familial	-	No		
		NBH	PASTORAL	Autosomal dominant	6 weeks	-		
OES	PASTORAL	Autosomal recessive	-	-				

Organ system	Condition	Breed	Group	Inheritance	Age of onset	DNA test	Related disorders	References
		CBR	GUNDOG	Autosomal dominant	6 mo-2 years	-		
		CSA	GUNDOG	Autosomal recessive	1-5 years	-		
		WSS	GUNDOG	Autosomal recessive	8-12 weeks	-		
		LT	TERRIER	Autosomal recessive	1-3 years	-		
		NWT	TERRIER	Autosomal recessive	6mo-2 years	-		
		PR	GUNDOG	Auto. dom (suspected)	2-3 years	-		
		SD	PASTORAL	Auto. rec. (suspected)	6 months	-		
		AST	TOY	Unknown	4-5 years	-		
		ACD	PASTORAL	Unknown	-	-		
		BMD	WORKING	Unknown	1 year	-		
		BDF	WORKING	Unknown	3 mo -1 year	-		
		GB	TOY	Unknown	-	-		
		WCC	PASTORAL	Unknown	-	-		
		WCP	PASTORAL	Unknown	1 year	-		
		FS	HOUND	Unknown	-	-		
		FB	UTILITY	Unknown	6 mo -3 years	Yes		
		GP	WORKING	Auto. rec. (suspected)	-	-		
		GWP	GUNDOG	Unknown	6-18 months	-		
		IW	HOUND	Unknown	1-2 years	-		
		IGH	TOY	Unknown	2-3 years	-		
		KH	UTILITY	Unknown	5 months	-		
		KBT	TERRIER	Unknown	2 years	-		
		KCS	TOY	Unknown	6 months	-		
		ME	TOY	Breed at increased risk	-	-		
		MT	TERRIER	Breed at increased risk	5 years	-		
		NT	TERRIER	Unknown	5 years	-		
		NEH	HOUND	Unknown	1-3 years	-		
		PN	TOY	Unknown	2-3 years	-		
		PKE	TOY	Unknown	-	-		
		MP	TOY	Breed at increased risk	1-5 years	-		
		POM	TOY	Unknown	4 years	-		
		CCR	GUNDOG	Unknown	5-8 years	-		
		SB	WORKING	Unknown	6-18 months	-		
		SKE	UTILITY	Unknown	7 years	-		
		SZR	UTILITY	Unknown	< 1 year	-		
		CBS	GUNDOG	Unknown	-	-		
		IWS	GUNDOG	Unknown	5 years	-		
		AWS	GUNDOG	Unknown	< 1 year	-		

Organ system	Condition	Breed	Group	Inheritance	Age of onset	DNA test	Related disorders	References
		FSL AUT JC CED EBMD	GUNDOG TERRIER TOY WORKING WORKING	Unknown Unknown Breed at increased risk Unknown Autosomal recessive	3 years - - - 1-2 years	- - - - -		
Ocular	Primary glaucoma (POAG, PCAG)	BDF CWCW DDT FTW FTS CSA NEH SD SB ACD JSI BOT BY WCC GS GH IGH LT ME MP ST SKY WSS WT MT PKE	WORKING UTILITY TERRIER TERRIER TERRIER GUNDOG HOUND PASTORAL WORKING PASTORAL UTILITY TERRIER GUNDOG PASTORAL WORKING HOUND HOUND TERRIER TOY TOY TERRIER TERRIER GUNDOG TERRIER TERRIER TOY	Unknown Unknown Unknown Unknown Unknown Unknown Unknown Unknown Unknown Unknown Unknown Unknown Breed at increased risk Breed at increased risk - - Breed at increased risk Breed at increased risk Breed at increased risk Breed at increased risk Breed at increased risk Autosomal dominant Unknown Breed at increased risk Unknown	- 3-6 years > 6 years - - 6 years >5 years 6 years - - - - - - - - - 2 years - 6-16 years - - - 10 weeks - 2-4 years -	- - - - - - - - - - - - - - - - - - - - - - - - -	Goniodysgenesis, increased intraocular pressure, lens luxation	137, 154, 170, 187, 265, 315, 399, 403, 423, 424
Ocular	Goniodysgenesis	JSI CSA WSS SWD BDF CWCW SD	UTILITY GUNDOG GUNDOG GUNDOG WORKING UTILITY PASTORAL	Unknown	Varies with breed	No	Primary closed angle glaucoma (PCAG)	250, 424, 452, 533, 534, 535, 536



Organ system	Condition	Breed	Group	Inheritance	Age of onset	DNA test	Related disorders	References
Ocular	Corneal oedema	AH	HOUND	Unknown	-	-	Anterior uveitis, corneal endothelial damage	24, 25
Ocular	Corneal ulcers	PKE	TOY	Unknown	-	-	Eye protrusion	337
Ocular	Corneal dystrophy (endothelial)	AT BOT KCS PR CSA	TERRIER UTILITY TOY GUNDOG GUNDOG	Sex-linked recessive Unknown Unknown Unknown Unknown	10 months 5-9 years 2-5 years 6 years 1-7 years	- - - - -	Loss of vision by 4 years, lipid dystrophy	29, 128, 423
Ocular	Spontaneous chronic corneal epithelial defects (SCCED)	BOT KH	UTILITY UTILITY	Breed at increased risk	6-8 years 8-9 years	- -	Refractory corneal ulceration, indolent ulcers	423, 500
Ocular	Choroidal hypoplasia (Collie Eye Anomaly, CEA)	CS LH AS	PASTORAL PASTORAL PASTORAL	Autosomal recessive Auto. rec. (suspected) Autosomal recessive	Puppy-Adult	Yes	Intraocular haemorrhage, blindness, defects of choroid, retina and optic nerve, retinal detachment	60-63, 250, 278
Ocular	Nictitans gland prolapse (including plasmona)	FB CSA NMF BH BI BOT PKE SB	UTILITY GUNDOG WORKING HOUND HOUND UTILITY TOY WORKING	Unknown Breed at increased risk Unknown Breed at increased risk Breed at increased risk Breed at increased risk Breed at increased risk Breed at increased risk	<2 years 1-2 years 1-2 years - 1-2 years 1-2 years 1-2 years	- No - - - - -	Keratoconjunctivitis sicca	200, 265, 297, 423
Ocular	Keratoconjunctivitis sicca	BH BOT PKE CSA	HOUND UTILITY TOY GUNDOG	Unknown Breed at increased risk Breed at increased risk Breed at increased risk	- - - -	- - - -		458, 526
Ocular	Ceroid lipofuscinosis (progressive vision loss)	ACD AS ES SKI PLS	PASTORAL PASTORAL GUNDOG HOUND PASTORAL	Autosomal recessive Autosomal recessive Autosomal recessive Unknown Auto. rec. (suspected)	12-18 months - 2-3 weeks 1-2 years -	No - - - -	Neurological deficits, blindness, gyrate atrophy, dementia	40-43, 72, 73, 173, 376, 438, 527
Ocular	Canine multifocal retinopathy	AS CDT MF PMD	PASTORAL TOY WORKING PASTORAL	Autosomal recessive	- 4 months 13 weeks 13 weeks	Yes		74, 75, 223

Organ system	Condition	Breed	Group	Inheritance	Age of onset	DNA test	Related disorders	References
Ocular	Lens luxation	ACD CC FTS FTW LH PRT ST WT WCC WCP GH MT NT NWT NEH MBT	PASTORAL TOY TERRIER TERRIER PASTORAL TERRIER TERRIER TERRIER TERRIER PASTORAL PASTORAL HOUND TERRIER TERRIER HOUND TERRIER	Autosomal recessive Unknown Unknown Unknown Autosomal recessive Unknown Unknown Unknown Unknown Unknown Unknown Unknown Breed at increased risk Unknown Unknown Unknown Unknown	Adult > 3 years 4-7 years 4-7 years > 3 years >3 years 4-6 years 5-6 years - - 3-5 years 2-4 years - - - 2-6 years > 3 years	Yes - - - Yes Yes Yes Yes - - - - - - - - Yes	Often accompanied with glaucoma	48, 49, 187, 188, 250, 277, 423, 530
Ocular	Multiple ocular defects	BH BI AS IT OES PWD	HOUND HOUND PASTORAL TERRIER PASTORAL WORKING	Unknown Unknown Auto. rec. (suggested) Auto. rec. (suggested) Unknown Unknown	- - - - - -	- - - - - -	Cataract, multifocal retinal dysplasia, colobomas, microphthalmia	65, 423, 460
Ocular	Uveal cysts	BOT CBR	UTILITY GUNDOG	Breed at increased risk	6 years 4-6 years	- -		423, 471
Ocular	Persistent hyperplastic primary vitreous (PHPV)	BDF	WORKING	Breed at increased risk	-	-	Persistent hyperplastic tunic vasculosa lentis (PHTVL), retinal dysplasia, optic nerve hypoplasia, cataract, congenital blindness	136
Ocular	Persistent hyperplastic tunic vasculosa lentis (PHTVL)	GP	WORKING	Autosomal recessive	-	No		201
Ocular	Persistent hyaloid artery	SS	GUNDOG	Unknown	-	No		423
Ocular	Persistent hyaloid remnants	AS	PASTORAL	Unknown	-	No	Unilateral or bilateral obstruction of lens	62, 67
Ocular	Persistent pupillary membranes	BJI WCC WCP	HOUND PASTORAL PASTORAL	Unknown Familial, unknown Familial, unknown	- - -	- - -	Multifocal retinal dysplasia	79-81, 250, 423

Organ system	Condition	Breed	Group	Inheritance	Age of onset	DNA test	Related disorders	References
		CWCW MF LT LH	UTILITY WORKING TERRIER PASTORAL	Breed at increased risk Auto. rec. (suspected) Auto. rec. (suspected) Breed at increased risk	- - - -	- - - -		
Ocular	Borzoi Chorioretinopathy	BI	HOUND	Unique defect in breed, unknown	7 mo - 7 years	No		125
Ocular	Retinal pigment epithelial dystrophy (RPED) (also hereditary retinal dystrophy, night blindness)	BD CS WCC PLS	PASTORAL PASTORAL PASTORAL PASTORAL	Autosomal recessive Unknown Unknown Unknown	<12 months 4-5 years - -	Yes No No -		250, 423, 528
Ocular	Retinal dysplasia (multifocal & total)	BT BMD ST HP CSA SS BY WCP GS IW NEH CBR SD FSL	TERRIER WORKING TERRIER PASTORAL GUNDOG GUNDOG GUNDOG PASTORAL WORKING HOUND HOUND GUNDOG PASTORAL GUNDOG	Autosomal recessive Familial Autosomal recessive Auto. rec. (suspected) Auto. rec. (suspected) Unknown Auto. rec. (suspected) Auto. rec. (suspected) Auto. rec. (suspected) Auto. rec. (suspected) Auto. rec. (suspected) Unknown Auto. rec. (suspected) Auto. rec. (suspected) Auto. rec. (suspected)	Birth 3 months - - - - - - - - - - - - -	- No - - - - - - - - - - - -	Retinal detachment	99, 115, 250, 396, 423
Ocular	Progressive retinal atrophy (PRA) (all types) Progressive rod and cone degeneration, rod-cone dystrophy	ACD AS BD WCC MF FL GIT GST GH HK IW NEH CBR NSDT	PASTORAL PASTORAL PASTORAL PASTORAL WORKING PASTORAL TERRIER GUNDOG HOUND PASTORAL HOUND HOUND GUNDOG GUNDOG	Auto rec. or co-dom Auto. rec. (suspected) Auto. rec. (suspected) Auto. rec. (suspected) Autosomal dominant Auto. rec. (suspected) Autosomal recessive Autosomal recessive Autosomal recessive Auto. rec. (suspected) Autosomal recessive Autosomal recessive Auto. rec. (suspected) Auto. rec. (suspected) Auto. rec. (suspected)	3-5 years - 4 years 8 weeks 4 months 18 months - - 12 months 18 months - - 6 weeks 8 mo, 7 years -	Yes Yes No Yes Yes Yes No No No Yes No Yes Yes Yes Yes	Extensive cataract formation	53, 55, 115, 139, 147, 172, 180, 213, 218, 231, 250, 265, 333, 335, 423, 427, 435, 457, 511, 532

Organ system	Condition	Breed	Group	Inheritance	Age of onset	DNA test	Related disorders	References
		CSA	GUNDOG	Autosomal recessive	2-3 years	Yes		
		TS	UTILITY	Autosomal recessive	3-7 years	No		
		CC	TOY	Auto. rec. (suspected)	-	Yes		
		PWD	WORKING	Autosomal recessive	3-5 years	Yes		
		SWD	GUNDOG	Auto. rec. (suspected)	18 months	Yes		
		SL	PASTORAL	Unknown	-	Yes		
		IRWS	GUNDOG	Autosomal recessive	6 months	Yes		
		SI	HOUND	Autosomal recessive	-	Yes		
		SD	PASTORAL	X-linked	2-5 years	Yes		
		PN	TOY	Autosomal recessive	> 7 years	Yes		
		PKE	TOY	Autosomal recessive	8 years	No		
		WSS	GUNDOG	Auto. rec. (assumed)	5-7 years	-		
		AST	TOY	Autosomal recessive	5-11 years	Yes		
		FTW	TERRIER	Auto. rec. (suspected)	2 years	-		
		FTS	TERRIER	Auto. rec. (suspected)	-	-		
		BT	TERRIER	Auto. rec. (suspected)	1-2 years	-		
		BMD	WORKING	Familial	<2 years	-		
		ME	TOY	Auto. rec. (suspected)	4-7 years	-		
		MT	TERRIER	Auto. rec. (suspected)	5-6 years	-		
		OES	PASTORAL	Auto. rec. (suspected)	4 years	-		
		MP	TOY	Auto. rec. (suspected)	7 years	-		
		PR	GUNDOG	Auto. rec. (suspected)	-	-		
		CCR	GUNDOG	Auto. rec. (suspected)	3-5 years	-		
		FSL	GUNDOG	Auto. rec. (suspected)	5 years	-		
		CED	WORKING	Autosomal recessive	3-5 years	Yes		
		EBMD	WORKING	Auto. rec. (suspected)	2-3 years	Yes		
Respiratory	Brachycephalic airway syndrome	AP BOT FB PKE	TOY UTILITY UTILITY TOY	Unknown	- - - 1-4 years	- - No -	Associated with selective breeding for facial characters. Brachycephaly, stridor, gastrointestinal tract lesions	4-8, 196, 336
Respiratory	Emphysema	AH	HOUND	Familial, mode unknown	Elderly adult	-	Bronchial dysplasia, hypoplasia with hypoplastic cartilage	12
Respiratory	Laryngeal paralysis (muscular dystrophy of larynx)	BDF AH PMD	WORKING HOUND PASTORAL	Autosomal dominant - Autosomal recessive	2-6 months - < 2 years	- - No	Exercise intolerance	4, 135, 362

Organ system	Condition	Breed	Group	Inheritance	Age of onset	DNA test	Related disorders	References
Respiratory	Kartagener's syndrome (Situs invertus viscerum)	CWCW	UTILITY	Autosomal recessive	< 3 months	-		155, 483
Respiratory	Chylothorax (pleural effusion)	AH	HOUND	Unknown	Adult	-	Torsion of the accessory lung lobes	17-22
Respiratory	Dyspnea (Hypoplastic trachea)	BOT	UTILITY	Unknown	Birth	-	Elongated soft palate, stenotic nares, cardiac defects, megaesophagus	130
Respiratory	Tracheal collapse	POM	TOY	Unknown	>6 years	-		353
Respiratory	Dysphagia	BDF	WORKING	Familial	-	-		133
Respiratory	Rhinitis (Bronchopneumonia syndrome)	IW	HOUND	Unknown	-	No		256
Respiratory	Ciliary dyskinesia	NFL OES PR	WORKING PASTORAL GUNDOG	Autosomal recessive Autosomal recessive Unknown	Adult Adult < 6 months	- - -	Pneumocid disease	301, 321, 519
Urogenital	D-glyceric acidurea (Glycerate kinase deficiency)	AH	HOUND	Autosomal recessive	-	-		11
Urogenital	Pyruvate kinase deficiency	BJI	HOUND	Autosomal recessive	-	Yes	Heamolytic anaemia	82-84
Urogenital	Fanconi's Syndrome (renal tubular transport dysfunction)	BJI	HOUND	Familial, presumed autosomal recessive	1-5 years	Yes	Polyuream polydipsia, metabolic acidosis, cysteine uroliths, thyroid gland dysfunction	85, 86
Urogenital	Cryptorchidism	ME OES PKE POM	TOY PASTORAL TOY TOY	Auto. rec. (suspected) Auto. rec. (suspected) Breed at increased risk Auto. rec. (suspected)	<Adult	- - - -	Neoplasia	289, 516
Urogenital	Urolithiasis (Urate and oxalate)	RBT CDT GS LM MF PRT AS ACD NFL	TERRIER TOY WORKING GUNDOG WORKING TERRIER PASTORAL PASTORAL WORKING	Autosomal recessive Unknown Unknown Unknown Autosomal recessive Unknown Breed at increased risk Unknown Unknown	- 3-4 weeks - - 2-5 years - 2-5 years 2-5 years -	Yes - - No - Yes - - -	Renal failure	120, 167, 211, 295, 433, 513

Organ system	Condition	Breed	Group	Inheritance	Age of onset	DNA test	Related disorders	References
		BJI DH MP OES	HOUND HOUND TOY PASTORAL	Breed at increased risk Unknown Breed at increased risk Breed at increased risk	2-5 years 2-5 years 2-5 years -	- - - -		
Urogenital	Canine ectopic ureter	FTS FTW NFL SKY	TERRIER TERRIER WORKING TERRIER	Breed at increased risk	< 1 year	- - - -		393, 497, 509
Urogenital	Vaginal hyperplasia (Vaginal prolapse)	MF NMF	WORKING WORKING	Breed at increased risk Breed at increased risk	1-3 <sup>rd</sup> oestrus 1 <sup>st</sup> -3 <sup>rd</sup> oestrus	- -		430, 489
Urogenital	Atresia ani (Congenital anal stenosis)	FS BOT ME CWCW	HOUND UTILITY TOY UTILITY	Breed at increased risk	- - - -	- - - -		491
Urogenital	Glomerulocystic kidney disease	BSM	PASTORAL	Unknown	Juvenile	-		100
Urogenital	Familial nephropathy (Familial renal disease; PLN, Protein losing nephropathy)	BMD NEH SCWT	WORKING HOUND TERRIER	Auto. rec. (suggested) Unknown Familial, unknown	3 years < 5 months > 6 years	- - -	Interstitial nephritis, renal disease	108, 314, 406, 407
Urogenital	Hereditary nephritis (Familial renal disease)	SD	PASTORAL	X-linked dominant	3-4 months	Yes	Hearing loss, renal failure	382
Urogenital	Oxalate nephropathy	TS	UTILITY	Unknown	-	-		434
Urogenital	Hypospadias	BOT	UTILITY	Congenital	-	-		131
Urogenital	Renal telangiectasia	WCP	PASTORAL	Unknown	5-13 years	-	Hematuria	340
Urogenital	Pyometra	BMD AT IT SB LBR KCS	WORKING TERRIER TERRIER WORKING WORKING TOY	Breed at increased risk	7 years 7 years 7 years 7 years 9 years -	No		117, 444, 457, 505
Urogenital	Prostatic carcinoma (Canine prostate cancer)	BDF BMD	WORKING WORKING	Breed at increased risk	Elderly	- -		473
Urogenital	Sry-negative sex reversal (no Y chromosome)	NEH MP	HOUND TOY	Autosomal recessive (expression only in	Birth	- No		316, 346, 413

Organ system	Condition	Breed	Group	Inheritance	Age of onset	DNA test	Related disorders	References
		CSA	GUNDOG	XX animals)				
Urogenital	Urethral sphincter mechanism incompetence	OES	PASTORAL	Breed at increased risk	> 1 year	-		512
Urogenital	Dystocia (Obstructed labour)	BOT FB POM BMD ME WCP GH PKE ST	UTILITY UTILITY TOY WORKING TOY PASTORAL HOUND TOY TERRIER	Breed at increased risk	- - - - - - - - -	No		132, 198,233, 357, 430, 477
Urogenital	Perinatal mortality	MH	UTILITY	Breed at increased risk	<1 month	-		510
Urogenital	Cystinuria	FB IT DH WCC AST BJI NFL ACD	UTILITY TERRIER HOUND PASTORAL TERRIER HOUND WORKING PASTORAL	Unknown Breed at increased risk Unknown Breed at increased risk Unknown Unknown Autosomal recessive Autosomal dominant	2-5 years - - 2-5 years - - - -	No No No No No No Yes Yes	Renal failure	197, 302, 433, 445
Urogenital	Renal amyloidosis	FH	HOUND	Familial	-	-		183
Urogenital	Renal dysplasia	KHE SCWT	GUNDOG TERRIER	Familial Unknown	<1 year <1 year	- Yes	Anemia, uraemia, renal failure	273, 407

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**Supplementary Table 3.** UK Kennel Club 10-year registration statistics (2004-2013 inclusive)

Breed	Group	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	TOTAL	Rank	Vulnerable Breed Status
Retriever (Labrador)	GUNDOG	45381	45779	45700	45079	45233	40943	44099	39964	36487	35026	423691	1	N
Spaniel (Cocker)	GUNDOG	16608	17468	20459	20883	22508	22211	23744	23258	23306	22943	213388	2	N
Spaniel (English Springer)	GUNDOG	14765	15180	15133	14702	14899	12700	13988	12883	12792	11316	138358	3	N
German Shepherd	PASTORAL	13578	13165	12857	12116	11903	10338	10364	9893	8502	7954	110670	4	N
Staffordshire Bull Terrier	TERRIER	12038	13070	12729	12167	10744	8746	8663	7113	6235	5767	97272	5	N
Cavalier King Charles Spaniel	TOY	10733	11165	11411	11422	11226	8884	8154	7446	5970	5145	91556	6	N
Retriever (Golden)	GUNDOG	10489	10165	9373	9557	9159	7804	7911	8081	7085	7117	86741	7	N
Border Terrier	TERRIER	7355	8338	8916	8814	9145	8214	8383	7188	6577	6390	79320	8	N
Boxer	WORKING	9689	9566	9066	8191	7353	5947	5699	5277	4622	4003	69413	9	N
West Highland Terrier	TERRIER	10110	9775	9300	8309	7330	5890	5361	4634	3975	3174	67858	10	N
Miniature Schnauzer	UTILITY	3347	4122	4396	5152	5333	5231	5651	5924	5797	5584	50537	11	N
Pug	TOY	1675	2116	2681	3547	4480	4769	5726	6221	7359	8071	46645	12	N
Shih Tzu	UTILITY	3263	3717	4436	5147	5495	5127	5247	5083	4565	4319	46399	13	N
Lhasa Apso	UTILITY	3485	3902	4154	4713	5117	4674	4865	4551	4449	3923	43833	14	N
Bulldog	UTILITY	2636	2997	3522	3979	4543	4217	4746	4659	4782	5769	41850	15	N
Rottweiler	WORKING	6726	6692	6575	4257	2631	2156	1959	1951	1554	1453	35954	16	N
Yorkshire Terrier	TOY	3877	3628	4042	4055	3951	3767	3441	3040	2505	2077	34383	17	N
Whippet	HOUND	2129	2468	2672	3043	3328	3246	3557	3295	3084	3226	30048	18	N
Bull Terrier	TERRIER	2996	3210	3361	3335	2922	2624	2467	2284	2132	1825	27156	19	N

Breed	Group	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	TOTAL	Rank	Vulnerable Breed Status
Dogue de Bordeaux	WORKING	1593	1951	2361	2543	2452	2790	2841	2895	2431	2366	24223	20	N
Border Collie	PASTORAL	2230	2247	2219	2359	2375	2356	2604	2400	2144	2115	23049	21	N
Bichon Frise	TOY	2311	2246	2329	2694	2757	2430	2509	2217	1734	1614	22841	22	N
Beagle	HOUND	1451	1709	1817	2124	2405	2592	2877	2687	2728	2365	22755	23	N
Doberman	WORKING	3341	3316	3388	2427	1871	1600	1678	1457	1346	1212	21636	24	N
Weimaraner	GUNDOG	2841	2848	2711	2724	2288	1951	1969	1581	1307	1261	21481	25	N
French Bulldog	UTILITY	350	324	526	692	1025	1521	2204	2771	4648	6990	21051	26	N
Chihuahua (Long/smooth coat)	TOY	788	884	1161	1435	1941	2104	2698	3060	3039	3111	20221	27	N
Shar-Pei	UTILITY	1449	1512	1987	2040	2261	2174	2304	2067	1706	1808	19308	28	N
Siberian Husky	WORKING	1527	1753	1993	2000	2094	2072	2209	1940	1684	1339	18611	29	N
Dalmation	UTILITY	2223	1930	1984	1657	1581	1356	1474	1488	1364	1163	16220	30	N
Carin Terrier	TERRIER	1761	1934	1834	1873	1946	1502	1453	1329	1035	1085	15752	31	N
Great Dane	WORKING	1728	1688	1839	1897	1419	1306	1429	1323	1281	1191	15101	32	N
Poodle (Toy)	UTILITY	1305	1517	1513	1671	1751	1403	1478	1476	1308	1304	14726	33	N
Shetland Sheepdog	PASTORAL	1638	1596	1577	1655	1634	1374	1333	1386	1085	1112	14390	34	N
Retriever (Flat Coated)	GUNDOG	1309	1707	1527	1718	1353	1233	1438	1387	1184	1299	14155	35	N
German Shorthaired Pointer	GUNDOG	1448	1489	1530	1497	1442	1281	1410	1424	1255	1367	14143	36	N
Tibetan Terrier	UTILITY	1303	1187	1378	1384	1600	1433	1429	1328	1283	1431	13756	37	N
Rhodesian Ridgeback	HOUND	1541	1493	1548	1618	1590	1101	1243	1200	1070	1066	13470	38	N
Bullmastiff	WORKING	1896	1623	1600	1594	1390	1149	1169	1044	948	672	13085	39	N

Breed	Group	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	TOTAL	Rank	Vulnerable Breed Status
Hungarian Vizsla	GUNDOG	867	943	1030	1133	1306	1332	1498	1588	1607	1765	13069	40	N
Akita	UTILITY	1688	1462	1275	1375	1080	1046	1038	955	732	654	11305	41	N
Basset Hound	HOUND	1190	1375	1495	1258	1433	1031	1003	912	766	721	11184	42	N
Irish Setter	GUNDOG	1183	1278	1229	1029	1332	847	1126	869	924	859	10676	43	N
Collie (Rough)	PASTORAL	1241	1258	1023	1196	1171	870	1046	1046	943	842	10636	44	N
Alaskan Malamute	WORKING	586	718	889	1161	1245	1195	1232	1295	1053	851	10225	45	N
Poodle (Standard)	UTILITY	1055	1047	879	1057	1029	955	1037	900	963	832	9754	46	N
Newfoundland	WORKING	838	1080	1145	957	1046	898	1026	862	921	861	9634	47	N
Poodle (Miniture)	UTILITY	849	1009	978	1038	996	916	945	957	952	900	9540	48	N
Scottish Terrier	TERRIER	1168	1121	1137	1031	918	729	837	695	677	712	9025	49	N
Dachund (Smooth/Long/Wire Hair)	HOUND	676	696	738	817	940	848	914	889	837	815	8168	50	N
Pomeranian	TOY	671	703	830	703	830	761	810	717	676	731	7432	51	N
Maltese	TOY	373	404	441	557	624	831	911	997	1085	1143	7366	52	N
Airedale Terrier	TERRIER	988	727	861	869	864	601	599	612	600	555	7276	53	N
Pointer	GUNDOG	686	702	829	704	742	741	678	751	687	699	7219	54	N
Papillon	TOY	710	726	850	829	896	839	654	614	529	543	7190	55	N
Boston Terrier	UTILITY	242	265	298	430	566	576	823	1076	1255	1447	6978	56	N
Bernese Mountain Dog	WORKING	812	768	792	631	680	706	613	730	494	636	6862	57	N
Parson Russell Terrier	TERRIER	804	776	764	892	680	714	554	539	562	499	6784	58	N
Fox Terrier (Wire)	TERRIER	748	668	688	634	763	604	693	646	669	604	6717	59	N

Breed	Group	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	TOTAL	Rank	Vulnerable Breed Status
St Bernard	WORKING	771	797	674	777	714	608	570	592	557	526	6586	60	N
Bearded Collie	PASTORAL	821	650	720	606	643	528	572	547	480	552	6119	61	N
Norfolk Terrier	TERRIER	543	663	631	686	635	603	534	577	546	568	5986	62	N
Old English Sheepdog	PASTORAL	603	663	536	692	529	413	507	401	429	461	5234	63	N
Chinese Crested	TOY	419	413	493	579	638	613	598	505	563	390	5211	64	N
Bedlington Terrier	TERRIER	536	531	471	495	505	491	569	558	506	482	5144	65	N
Pekingese	TOY	613	651	530	567	490	454	460	451	457	354	5027	66	N
Welsh Corgi (Pembroke)	PASTORAL	618	491	533	471	464	329	363	371	333	328	4301	67	N
Italian Spinone	GUNDOG	293	425	353	450	459	379	434	509	441	517	4260	68	N
Spaniel (Welsh Springer)	GUNDOG	420	442	352	376	510	381	338	396	348	353	3916	69	N
Spaniel (American Cocker)	GUNDOG	599	447	501	435	363	322	324	325	318	263	3897	70	N
Chow Chow	UTILITY	381	364	438	448	453	300	441	328	336	393	3882	71	N
Irish Wolfhound	HOUND	384	460	418	487	439	323	352	321	302	322	3808	72	N
German Wirehaired Pointer	GUNDOG	420	432	287	392	437	423	348	344	380	333	3796	73	N
English Setter	GUNDOG	547	427	450	416	399	295	349	234	314	326	3757	74	N
Welsh Terrier	TERRIER	305	326	386	377	360	337	432	415	352	447	3737	75	N
Leonberger	WORKING	348	353	438	383	446	306	399	358	298	391	3720	76	N
Soft-Coated Wheaten Terrier	TERRIER	287	321	403	324	352	284	405	433	455	372	3636	77	N
Miniature Pinscher	TOY	188	270	312	331	397	384	390	411	428	368	3479	78	N
Hungarian Wire Haired Vizsla	GUNDOG	183	160	253	252	262	284	393	473	368	620	3248	79	N

Breed	Group	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	TOTAL	Rank	Vulnerable Breed Status
Samoyed	PASTORAL	387	408	338	339	354	280	333	316	245	224	3224	80	N
Irish Terrier	TERRIER	227	270	324	271	369	289	357	277	306	362	3052	81	Y
Gordon Setter	GUNDOG	356	309	345	312	362	192	306	245	252	273	2952	82	N
Schnauzer	UTILITY	347	335	367	218	331	279	282	231	272	286	2948	83	N
Mastiff	WORKING	434	476	483	354	299	252	157	173	140	139	2907	84	N
Deerhound	HOUND	331	264	252	327	309	324	256	237	260	236	2796	85	Y
Lakeland Terrier	TERRIER	225	330	277	269	303	283	254	247	208	221	2617	86	Y
Giant Schnauzer	WORKING	339	270	313	216	276	196	244	204	237	187	2482	87	N
Japanese Chin	TOY	201	239	233	242	279	246	302	261	256	182	2441	88	N
Kerry Blue Terrier	TERRIER	274	277	263	267	198	190	223	212	210	169	2283	89	Y
Bull Terrier (Miniture)	TERRIER	201	275	212	294	225	227	223	216	192	161	2226	90	Y
Tibetan Spaniel	UTILITY	254	238	264	249	202	227	232	217	193	140	2216	91	N
Japanese Shiba Inu	UTILITY	185	147	170	190	173	214	240	226	238	223	2006	92	N
Neapolitan Mastiff	WORKING	295	316	263	255	205	114	109	209	99	107	1972	93	N
Spaniel (Clumber)	GUNDOG	158	192	247	223	198	211	271	35	151	247	1933	94	Y
King Charles Spaniel	TOY	157	193	251	177	187	150	199	180	217	161	1872	95	N
Retriever (Nova Scotia Duck Trolling)	GUNDOG	99	99	157	162	187	162	195	304	210	192	1767	96	N
Griffon Bruxellois	TOY	172	185	174	170	224	173	201	160	148	155	1762	97	N
Italian Greyhound	TOY	114	114	97	137	157	193	215	260	208	231	1726	98	N
Afghan Hound	HOUND	235	213	194	198	147	140	122	124	162	138	1673	99	N

Breed	Group	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	TOTAL	Rank	Vulnerable Breed Status
Pyrenean Mountain Dog	PASTORAL	222	220	178	159	211	143	78	180	105	82	1578	100	N
Basset Griffon Vendéen (Petit)	HOUND	209	220	154	136	102	178	122	142	154	148	1565	101	N
Norwich Terrier	TERRIER	124	131	147	128	152	160	172	158	170	194	1536	102	Y
Fox Terrier (Smooth)	TERRIER	188	212	173	137	178	133	155	137	94	122	1529	103	Y
Havanese	TOY	69	92	89	121	140	162	176	199	232	225	1505	104	N
Australian Shepherd	PASTORAL	164	90	176	113	155	181	135	142	124	202	1482	105	N
Japanese Spitz	UTILITY	118	112	154	181	190	165	126	129	151	125	1451	106	N
Briard	PASTORAL	144	158	161	112	201	148	112	159	126	126	1447	107	N
Brittany	GUNDOG	150	126	167	203	158	80	136	94	137	158	1409	108	N
German Spitz (Klein)	UTILITY	133	165	163	169	157	140	124	125	105	106	1387	109	N
Spannish Water Dog	GUNDOG	44	97	86	135	146	156	188	190	146	198	1386	110	N
Manchester Terrier	TERRIER	115	140	133	113	135	146	107	152	124	198	1363	111	Y
Lancashire Heeler	PASTORAL	147	166	173	146	158	133	134	98	104	103	1362	112	Y
Coton de Tulear	TOY	25	55	75	104	101	116	140	253	227	262	1358	113	N
Saluki	HOUND	104	86	104	73	131	189	238	140	150	95	1310	114	N
Belgian Shepherd (Tervueren)	PASTORAL	178	124	169	195	140	75	142	92	112	83	1310	115	N
Large Munsterlander	GUNDOG	165	133	122	154	119	140	102	119	96	108	1258	116	N
Affenpinscher	TOY	178	147	128	118	144	144	68	114	121	63	1225	117	N
Spaniel (Irish Water)	GUNDOG	121	106	105	162	101	131	117	101	148	101	1193	118	Y
Borzoi	HOUND	139	138	154	114	133	118	89	67	122	109	1183	119	N

Breed	Group	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	TOTAL	Rank	Vulnerable Breed Status
Retriever (Chesapeake Bay)	GUNDOG	172	139	168	110	126	72	111	133	76	69	1176	120	N
English Toy Terrier (Black & Tan)	TOY	103	103	114	128	117	113	136	95	126	115	1150	121	Y
Lowchen (Little Lion Dog)	TOY	120	136	106	124	121	112	112	108	111	92	1142	122	N
Dandie Dinmont Terrier	TERRIER	81	149	78	124	119	108	151	98	120	105	1133	123	Y
Bolognese	TOY	63	67	72	113	136	128	133	113	131	143	1099	124	N
Belgian Shepherd (Malinois)	PASTORAL	66	74	86	92	129	92	138	116	111	151	1055	125	N
Irish Red & White Setter	GUNDOG	123	120	115	93	142	85	83	119	89	82	1051	126	Y
Retriever (Curly Coated)	GUNDOG	131	82	187	81	128	93	72	62	71	118	1025	127	Y
Basset Griffon Vendéen (Grand)	HOUND	137	100	84	127	81	53	107	116	102	117	1024	128	N
Bouvier des Flandres	WORKING	132	159	103	96	87	71	105	98	57	78	986	129	N
Basset Fave de Bretagne	HOUND	78	87	103	89	122	82	117	75	103	95	951	130	N
Keeshond	UTILITY	67	86	99	95	88	77	113	122	90	100	937	131	N
Portuguese Water Dog	WORKING	39	41	83	46	74	91	139	97	125	195	930	132	N
Eurasier	UTILITY	23	44	39	76	145	91	161	147	90	93	909	133	N
Russian Black Terrier	WORKING	136	129	129	93	54	35	57	66	75	52	826	134	N
Welsh Corgi (Cardigan)	PASTORAL	76	77	84	68	81	79	46	108	94	102	815	135	Y
German Spitz (Mittel)	UTILITY	72	85	80	104	68	94	87	71	82	57	800	136	N
Bloodhound	HOUND	126	104	70	100	114	60	55	59	50	51	789	137	N
Norwegian Elkhound	HOUND	118	116	84	98	55	98	33	42	62	71	777	138	N
Belgian Shepherd (Groenendael)	PASTORAL	126	66	40	92	89	90	95	60	71	33	762	139	N



Breed	Group	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	TOTAL	Rank	Vulnerable Breed Status
Australian Cattle Dog	PASTORAL	93	90	69	80	84	92	69	65	65	33	740	140	N
Collie (Smooth)	PASTORAL	72	72	53	63	43	74	54	75	88	82	676	141	Y
Portuguese Podengo	HOUND	47	61	108	73	108	64	72	80	23	29	665	142	N
Spaniel (Sussex)	GUNDOG	79	77	74	61	56	60	68	52	74	55	656	143	Y
Spaniel (Field)	GUNDOG	86	86	64	67	75	51	55	46	47	29	606	144	Y
Hungarian Puli	PASTORAL	66	73	55	78	70	37	56	59	71	30	595	145	N
Sealyham Terrier	TERRIER	51	58	57	65	43	47	49	63	76	68	577	146	Y
Polish Lowland Sheepdog	PASTORAL	37	43	68	63	63	75	26	55	65	69	564	147	N
Tibetan Mastiff	WORKING	37	30	60	57	59	48	40	63	75	73	542	148	N
Glen Of Imaal Terrier	TERRIER	43	45	41	36	89	46	61	67	57	55	540	149	Y
Schipperke	UTILITY	77	70	88	23	63	51	49	31	39	37	528	150	N
Finnish Lapphund	PASTORAL	39	49	32	65	46	50	55	68	63	54	521	151	N
Slovakian Rough Haired Pointer	GUNDOG	11	30	54	53	55	68	56	61	43	69	500	152	N
Bracco Italiano	GUNDOG	23	31	51	31	57	46	79	43	72	62	495	153	N
Australian Terrier	TERRIER	60	60	62	38	55	57	36	46	30	33	477	154	N
Basenji	HOUND	53	55	37	42	59	37	49	28	46	46	452	155	N
Skye Terrier	TERRIER	50	30	84	37	27	75	37	44	42	17	443	156	Y
Anatolian Shepherd	PASTORAL	66	41	54	48	48	47	27	39	44	27	441	157	N
Otterhound	HOUND	11	50	51	41	38	57	57	38	37	42	422	158	Y
Swedish Vallhund	PASTORAL	40	39	46	40	40	50	29	43	33	58	418	159	N

Breed	Group	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	TOTAL	Rank	Vulnerable Breed Status
Japanese Akita Inu	UTILITY	0	0	38	29	39	24	70	50	68	84	402	160	N
Greyhound	HOUND	31	49	44	48	46	33	65	14	30	40	400	161	Y
Cesky Terrier	TERRIER	31	57	44	60	29	28	34	24	26	26	359	162	N
Bavarian Mountain Hound	HOUND	3	20	10	16	32	54	73	39	10	80	337	163	N
Lagotto Romagnola	GUNDOG	47	20	25	16	31	32	23	35	45	46	320	164	N
Estrela Mountain Dog	PASTORAL	34	39	25	29	46	41	33	21	11	19	298	165	N
Finnish Spitz	HOUND	36	37	23	35	36	20	36	10	11	19	263	166	N
Norwegian Buhund	PASTORAL	36	15	20	28	22	22	29	14	32	45	263	167	N
Korthals Griffon	GUNDOG	13	20	16	22	14	43	26	37	16	55	262	168	N
Pharoah Hound	HOUND	35	20	21	9	27	36	38	29	14	27	256	169	N
Hovawart	WORKING	12	38	27	41	18	45	4	34	11	17	247	170	N
Maremma Sheepdog	PASTORAL	17	19	18	9	37	28	25	25	25	31	234	171	N
Catalan Sheepdog	PASTORAL	0	0	7	15	46	28	25	53	32	24	230	172	N
German Longhaired Pointer	GUNDOG	26	9	36	40	5	28	23	26	17	9	219	173	N
Pyrenean Sheepdog (Long haired)	PASTORAL	34	20	25	27	27	6	36	5	12	26	218	174	N
Australian Silky Terrier	TOY	19	31	18	23	41	11	23	11	19	11	207	175	N
Hamiltonstovare	HOUND	32	24	20	19	17	16	6	27	6	17	184	176	N
Beauceron	WORKING	8	24	16	20	8	25	1	31	19	23	175	177	N
Kooikerhondje	GUNDOG	17	0	11	11	5	11	14	10	33	33	145	178	N
Greater Swiss Mountain Dog	WORKING	0	0	0	0	5	24	23	26	22	41	141	179	N

Breed	Group	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	TOTAL	Rank	Vulnerable Breed Status
Canaan Dog	UTILITY	22	13	22	13	8	6	12	24	10	8	138	180	N
German Pinscher	WORKING	19	10	14	15	16	1	12	11	13	15	126	181	N
Ibizan Hound	HOUND	6	14	7	7	17	25	8	7	19	4	114	182	N
Cirneco Dell'Etna	HOUND	3	7	1	10	23	10	8	22	3	19	106	183	N
Korean Jindo	UTILITY	0	0	19	13	6	13	21	0	14	11	97	184	N
Greenland Dog	WORKING	10	17	20	5	2	5	9	1	14	10	93	185	N
Canadian Eskimo Dog	WORKING	0	7	4	3	12	11	7	1	15	12	72	186	N
Sloughi	HOUND	19	6	0	8	0	4	8	1	14	11	71	187	N
Komondor	PASTORAL	3	0	13	1	16	8	6	9	9	2	67	188	N
Mexican Hairless (Intermediate)	UTILITY	0	0	0	5	3	6	15	6	20	2	57	189	N
Foxhound	HOUND	0	5	0	14	7	1	0	9	0	11	47	190	N
Entlebucher Mountain Dog	WORKING	5	0	1	1	1	6	6	7	11	6	44	191	N
Grand Bleu de Gacogne	HOUND	2	17	3	2	19	0	0	0	0	0	43	192	N
Bergamasco	PASTORAL	4	14	0	0	0	0	1	2	14	7	42	193	N
Basset Bleu de Gascogne	HOUND	8	4	7	1	0	5	0	4	0	11	40	194	N
Belgian Shepherd (Laekenois)	PASTORAL	1	0	0	0	13	2	17	0	0	1	34	195	N
Mexican Hairless (Miniture)	UTILITY	0	0	0	0	0	0	2	1	5	23	31	196	N
Azawakh	HOUND	11	7	1	0	1	1	6	0	3	0	30	197	N
Portuguese Pointer	GUNDOG	0	0	0	0	0	0	0	0	0	27	27	198	N
Small Munsterlander	GUNDOG	0	15	3	0	0	0	0	0	1	0	19	199	N

Breed	Group	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	TOTAL	Rank	Vulnerable Breed Status
Mexican Hairless (Standard)	UTILITY	0	0	0	0	1	0	1	11	2	0	15	200	N
Swedish Lapphund	PASTORAL	1	0	1	7	0	3	0	0	1	1	14	201	N
Turkish Kangal Dog	PASTORAL	0	0	0	0	0	0	0	0	0	14	14	202	N
Segugio Italiano	HOUND	5	0	0	6	0	0	0	0	0	0	11	203	N
Mexican Hairless	UTILITY	2	1	4	0	0	0	0	0	0	0	7	204	N
Pyrenean Mastiff	WORKING	2	1	0	0	0	0	1	0	0	0	4	205	N
Spaniel (American Water)	GUNDOG	0	0	1	0	0	0	0	0	1	1	3	206	N
Hungarian Kuvasz	PASTORAL	2	0	1	0	0	0	0	0	0	0	3	207	N