

Multidrug Sensitivity in Herding Breeds: MDR1 Gene Mutation

MDR1 Gene Mutation: The MDR1 gene encodes P-glycoprotein, a drug transport pump that plays an important role in limiting drug absorption and distribution (particularly to the brain), as well as enhancing the excretion of many drugs used in dogs. Some dogs, particularly herding breeds, have a mutation in the MDR1 gene, leaving them defective in their ability to limit drug absorption and distribution. These dogs also have delayed excretion of drugs that are normally transported by P-glycoprotein, making them susceptible to severe drug toxicity.

Drugs Affected by the MDR1 Gene Mutation:

Acepromazine	Ivermectin	Paclitaxel
Butorphanol	Loperamide	Selamectin
Doramectin	Milbemycin	Vinblastine
Doxorubicin	Moxidectin	Vincristine
Erythromycin		Vinorelbine

Breeds affected by the MDR1 mutation (frequency %)

Breed	Approximate Frequency
Australian Shepherd	50%
Australian Shepherd, Mini	50%
Border Collie	< 5%
Collie	70 %
English Shepherd	15 %
German Shepherd	10 %
Herding Breed Cross	10 %
Long-haired Whippet	65 %
McNab	30 %
Mixed Breed	5 %
Old English Sheepdog	5 %
Shetland Sheepdog	15 %
Silken Windhound	30 %

Testing a Dog for the MDR1 Mutation is Easy:

Order a testing kit by contacting the Veterinary Clinical Pharmacology Laboratory at Washington State University: www.vcpl.vetmed.wsu.edu or by phone 509-335-3745