

# Ivermectin: Is Your Dog At Risk By Breed?

June 26, 2016 [National Purebred Dog Day®](#)

It never hurts to remind folks that certain breeds are sensitive to certain drugs, and during this time of year when the climate turns warm, it's especially important to talk about Ivermectin, an effective medication for humans used to treat any number of maladies in humans, including fighting parasites, head lice, scabies, river blindness, and strongyloidiasis. It is, in fact, on the World Health Organization's list of the most important medications needed in a basic health care system.

Ivermectin was discovered in 1975, came into medical use in 1981, and was first used for dogs in 1982. We shudder to think how many dogs it took before it was realized that certain dog breeds with the MDR1 gene (the P-glycoprotein gene) can be lethally sensitive to ivermectin, the active ingredient in a product like Heartgard. The gene mutation allows the drug to build up in the brain where it can cause neurological reactions, including tremors, disorientation and blindness. Sensitivity to Ivermectin is not a given, but the owners of certain breeds need to be aware that their dogs are more at risk.

These breeds are:

- Old English Sheepdog
- English Shepherd
- Shetland Sheepdog
- Lagotto Romagnolo
- Bearded Collies
- Australian Shepherd
- German Shepherd
- Certain Whippets
- Silken Windhound
- Skye Terrier
- Border Collie

- Collie
- Miniature American Shepherd

Washington State University College of Veterinary Medicine first discovered the MDR1 mutation, and in 2010, developed test procedures to identify dogs with the mutation. Mixed breeds are not immune. Collie-type mixed breeds are at risk, too.

Learn more about the genetic test [here](#):

There's one more thing – **a hugely important thing** – for breed owners to know. Dogs, especially those with the MDR1 mutation, should never be given large animal formulations that contain ivermectin. You might think to yourself, “Who on earth would do that?”

A rancher would. But not to the dog. A rancher, farmer, or sheep owner would reasonably treat their stock with large animal formulations, and how this impacts a dog is best illustrated by what happened to an Australian Shepherd last year. The dog and his owner attended a sheep herding session, and as is often the case, the dog found the sheep pellets to be tasty morsels. Unbeknownst to anyone other than the owner of the sheep, the sheep had been treated the day before with Ivermectin. Few of us would think to ask in advance of taking our dogs to go herding when the last time was that the sheep were treated with drugs.

The dog became critically ill within a short time, and it was quite literally touch-and-go for the dog for weeks. To our knowledge, the Aussie did make a complete recovery, but there was never a time early on when death wasn't a realistic outcome for the dog. Be aware, ask questions, and run the gene test on your dog if his or her breed warrants it.

## New Warning About Serious Drug Side Effects - Is Your Dog's Breed At Risk?

Ivermectin is an anti-parasite medication given to dogs to prevent heartworm disease and to treat various other parasite-related conditions like demodectic and sarcoptic mange, and ear mites.

The most common side effects of this drug are relatively mild and include:

- Vomiting
- Diarrhea
- Lack of appetite
- Lethargy



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Every dog should be tested for heartworms prior to administration of **ivermectin**, because dogs already invaded by microfilaria (heartworms at the larval stage of development) can have a serious reaction to the medication.

In those dogs, ivermectin can cause a fatal side effect characterized by symptoms of shock including vomiting, hypothermia and depression.

Ivermectin has also been associated with a central nervous system event in some dogs which leads to loss of coordination, seizures, and in some cases, death.

Researchers at Washington State University's College of Veterinary Medicine have discovered that certain dog breeds are more sensitive to some drugs, including ivermectin, than other breeds. This drug sensitivity results from a mutation in the multi-drug resistance gene (MDR1).

For veterinary use to prevent heartworms in dogs, ivermectin is the active ingredient in products such as:

Ivomec® and Heartgard® by Merial

Zimectrin® by Farnam

Iverhart® by Virbac

Tri-Heart® by Intervet

Various generics

Ivermectin works by causing neurological damage to specific parasites -- including common intestinal worms (excluding tapeworms), most mites and some lice -- which results in paralysis and death.

The dosages of ivermectin in heartworm preventive medications are significantly lower than doses used for other purposes.

Currently, the FDA approves use of ivermectin for heartworm prevention and the treatment of ear mites (Acarexx®) only. All other uses of the drug -- for example to treat certain varieties of mange, or to clear heartworm larvae in dogs with active heartworm infection -- are considered off-label.

If your vet prescribes ivermectin for your dog for off-label use, be aware the dosage can be as much as 50 times greater than the dose in a heartworm preventive.

## **Multidrug Sensitive Dog Breeds**

As noted in the linked article, Washington State University has identified a mutation of the multi-drug resistant gene (MDR1) in certain dog breeds which can cause serious adverse reactions to some drugs, ivermectin among them.

The gene in question encodes a particular protein responsible for flushing toxins, including many drugs, from the brain. Dogs with the MDR1 mutation aren't able to efficiently pump toxins out of the brain, which can result in a serious and even fatal neurologic condition.

According to [WSU's College of Veterinary Medicine](#):

*Approximately three of every four Collies in the United States have the mutant MDR1 gene. The frequency is about the same in France and Australia, so it is likely that most Collies worldwide have the mutation.*

The full list of affected breeds known at this time:

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

The only way to know if your dog has the mutant MDR1 gene is to [test for it](#). At my animal hospital, I recommend proactive owners find out if their breed susceptible dog has this gene before administering any ivermectin based product.

WSU anticipates more breeds will be added to the list as more dogs are tested.

You can find a list of other drugs known to cause problems for dogs with the mutant MDR1 gene at WSU's [Problem Drugs](#) page.

**Is There a Safer Heartworm Preventive?**

There are only a few areas in the U.S. where giving a nine month to year-round heartworm preventive might be advisable – those areas are in south Texas, south Florida, and a few other locations along the Gulf coast. The rest of the U.S. ranges from three to seven months of high exposure risk. The majority of states are at six months or less.

I recommend you talk to a [holistic vet](#) in your area to understand your dog's actual risk of exposure to infected mosquitoes. A local holistic practitioner will be able to guide you in determining:

The risk of heartworm disease in your area

Potential side effects of chemical preventive drugs

Alternatives to these products that can be used alone or in conjunction with them

Detox agents to help your dog's body recover, if necessary

Keeping your pet's immune system in excellent shape provides a foundation of good health, including the ability to avoid or successfully fight off parasitic invaders.

[Feed a balanced, species-appropriate diet](#). The healthier your dog is, the less attractive she'll be to all types of pests and parasites, and the better able her immune system will be to fight off invaders. Parasites are more attracted to weak animals.

And speaking of keeping her immune system healthy, take care not to allow your pet to be overloaded with toxins through [unnecessary vaccinations](#) and repeated courses of antibiotic or steroid therapy – two of the most overprescribed drugs in veterinary medicine.

Additional information on heartworm infection rates, prevention guidelines by state, and additional tips for how to keep your dog healthy and safe from heartworm infection can be found [here](#).