Check before Giving these Drugs to Dogs with the MDR1 Mutation

The following drugs are known to cause toxicity for dogs with the MDR1 mutation. In some cases, normal doses can be reduced, while for others, the drugs should never be given to dogs who have one or two copies of the mutated gene, or to dogs from affected breeds and mixed-breed dogs of unknown parentage who have never been tested:

Butorphanol (Torbugesic, Torbutrol). Used to treat pain and as a cough suppressant. Sometimes used as a pre-anesthetic agent. Dosage should be reduced up to 50 percent for affected dogs. Butorphanol is not recommended for pain control because the effects are short-term, lasting less than one hour. Tramadol or opiates are better choices and should be safe to use for affected dogs. (See Pain Relief for more information.)

Acepromazine (Ace). Used as a tranquilizer and as a pre-anesthetic agent. Dosage should be reduced up to 50 percent for affected dogs. Ace is not effective for treating anxiety, such as from thunderstorms; use alprazolam or clonidine instead. (See Anxiety Medications for Dogs for more information.)

Loperamide (Imodium). Used to treat diarrhea, available in some over-the-counter preparations. Should be avoided in all dogs with the MDR1 mutation. (See Diarrhea (occasional or short-term) for more information.)

Doxorubicin, vinblastine, and vincristine: Chemotherapy drugs. Affected dogs are more likely to suffer from bone marrow suppression and gastrointestinal side effects. Dosage should be reduced up to 50 percent and dogs closely monitored.

Erythromycin. Antibiotic.

Ivermectin (Ivomec), milbemycin, moxidectin, selamectin. Safe when used at low heartworm preventive doses but should not be given at the higher doses used to treat other parasites. Advantage Multi has been approved in Europe for topical use in treating demodectic mange and was shown to be safe for affected dogs at recommended doses (applied once a month).

Emodepside (Profender). Deworming agent.

The following drugs are also affected by PGP but appear to be safe for use in dogs with the MDR1 mutation, as there have been no reports of toxicity. Normal dosages can be given but dogs should be monitored for adverse effects:

Digoxin (Digitalis). Used to treat heart disease.

Morphine, buprenorphine (Buprenex), fentanyl. Opiates used to treat pain.

Cyclosporin (Atopica). Immunosuppressive drug used to treat allergies and autoimmune disease.

Doxycycline. Antibiotic.

There are many other drugs that might be problematic for which no data is available. The following drugs should be used with caution for dogs with the MDR1 mutation, starting with low doses and gradually increasing if no side effects are seen:

Domperidone. Used in Canada and elsewhere to improve gastric motility.

Etoposide, mitoxantrone, paclitaxel (Paclical Vet). Chemotherapeutic drugs.

Ondansetron (Zofran). Used to stop vomiting.

Rifampicin, Rifampin. Used to treat bacterial and fungal infections. Additional medications potentially affected by PGP may be listed on other sites, but according to Dr. Mealey, there is no evidence that many of these drugs will affect dogs with the MDR1 mutation. In fact, she says, “We know that many of the drugs on those extensive lists have been used safely in dogs with the MDR1 mutation. That is why the list on the WSU VCPL website is different from many other lists.”

Flea and tick control medications have not been found to cause adverse effects when used as directed, but toxicity can occur if topical products are ingested. Advantage Multi, which combines imidacloprid for flea control with moxidectin for heartworm prevention, was found to cause no side effects when applied topically to affected dogs even at 5 times the recommended dose, but ingesting less than half the recommended topical dose caused extreme toxicity leading to coma in four of five dogs.