

# Dog Breeds That Need Extra TLC When Facing Surgery

Some breeds face additional risks with surgery. They take longer to recover and face risks other breeds don't have. Serious risks, like heart disease, medications accumulating in their brain, breathing problems, and more. What to know before your dog goes under the knife.

Analysis by Dr. Karen Shaw Becker

## STORY AT-A-GLANCE

- Most dog parents feel uneasy when their pet must be given general anesthesia during a veterinary procedure
- There are established anesthesia protocols that apply to all dogs, however, certain breeds require special handling to be safely anesthetized
- Brachycephalic dogs (dogs with short muzzles), sighthounds, herding breeds, toy and giant breeds are among the breeds that require specialized care during veterinary procedures requiring anesthesia

***Editor's Note: This article is a reprint. It was originally published April 13, 2016.***

For many pet guardians, there are few things as anxiety-producing as the thought of their precious animal companion "going under" (receiving general anesthesia for a veterinary procedure).

Whereas local anesthesia is used to numb a specific area of the body, general anesthesia renders the patient unconscious. For many of us, the mental image of a helpless furry family member lying unconscious on a steel table can be extremely unsettling.

However, just as in human medicine, general anesthesia is necessary in veterinary medicine to:

- Help relax the muscles of your pet's body
- Remove his ability to fight against the procedure
- Insure he feels no pain during the procedure

The good news is that veterinary medicine has seen significant improvements in recent years in anesthetic agents. Most anesthesia drugs used in today's vet clinics are highly predictable and reversible.

## All Dogs Are Not Created Equal While Anesthetized

All dogs, from the tiniest lap dog to the giant Newfoundland, are descendants of wolves and share a common physiology. However, different breeds have different needs when it comes to receiving anesthesia.

Genetic differences among breeds, along with differences in anatomy (conformation), play a critical role in the safe delivery of anesthesia drugs. For example, brachycephalic dogs (breeds with pushed in faces, such as the Boxer) are at higher risk for airway obstruction than breeds with longer muzzles.

There are breeds predisposed to increased responsiveness to anesthesia, which means it takes less of the drug to produce the desired effect, which increases the risk for overdose. There are also breeds that take much longer to recover from anesthesia than others.

Pets with heart disease are another high-risk group. If heart problems, either acquired or congenital, are known or suspected, a veterinary cardiologist should be consulted before a procedure that requires anesthesia is performed.

Higher risk breeds suffering from metabolic disorders are an even greater anesthetic risk.

Diabetes, hypothyroidism, Cushing's and Addison's disease (adrenal disease, at both ends of the spectrum) as well as obese animals and those suffering from liver or kidney disease, all require additional special consideration when it comes to calculating pre-anesthetic drug doses, fluid choice and load, as well as the type and amount of maintenance anesthesia through surgery.

## General Anesthesia Guidelines for All Dogs

There are certain protocols that apply to all dogs undergoing anesthesia. These include:

- **Pre-anesthetic patient assessment and preparation** — The purpose of the pre-anesthetic evaluation is to identify individual risk factors that could influence the patient's ability to tolerate anesthesia. These include things such as the dog's physical status, age, breed, and temperament.

Patient preparation means readying the animal for anesthesia, including administration of medications and fasting requirements.

- **Pre-medication** — This occurs within an hour of the procedure and involves giving sedatives and pain drugs preemptively to reduce the amount of induction drugs and maintenance anesthesia needed. It also relaxes the patients.

If the animal is fractious, high strung, or nervous, the IV catheter is placed after the pre-medication is given, allowing a less stressful catheter insertion.

- **Induction drugs** — These drugs, usually given intravenously in the catheter, rapidly move animals from consciousness to unconsciousness, and allow for the placement of the endotracheal tube that will be used to maintain anesthesia.

Maintenance of anesthesia, after induction, is usually with a volatile gas anesthetic like isoflurane or sevoflurane, also using the endotracheal tube. Local nerve block agents may also be used, as well as various drugs infused intravenously to control pain.

- **Monitoring during anesthesia** — While the patient is unconscious, heart rate, respiration, temperature, blood pressure and central nervous system functions are monitored continuously so the depth of anesthesia and surgical environment can be adjusted as necessary.

During and after the procedure, emergency drugs and equipment plus an action plan for their use should be available, in addition to IV access and agents to maintain circulating blood volume.

- **Monitoring during recovery** — Throughout the recovery period, veterinary staff trained in the detection of anesthesia recovery problems should monitor the patient. This should be done in conjunction with monitoring body temperature and level of sedation, and administration of appropriate pain management drugs.

## Breed-Specific Anesthesia Protocols

Your veterinarian and his or her staff should be aware of breed-related sensitivities, as well as potential metabolic complications, and take all necessary precautions before, during and after anesthesia. If your dog belongs to any of the following groups, as an informed pet owner you can provide a double layer of protection in the care of your beloved four-legged companion.

### Brachycephalic Breeds

Most brachys (for example, Bulldogs, Pugs, Boxers, Boston Terriers, Shih Tzus, as well as cats with flat faces) have some degree of brachycephalic airway syndrome. The stress placed on the airways from the use of anesthesia can result in additional airway contraction, which can cause obstruction.

Brachycephalic pets must be closely monitored from the point of premedication through the final step of extubation. Extubation (removal of the breathing tube) shouldn't be attempted until the pet is awake, alert and swallowing. Removing the tube while the animal is still groggy from anesthesia increases the risk for upper airway obstruction.

Throughout the recovery period, brachycephalic dogs should be monitored with extreme care. It takes just seconds for a brachy to get into serious trouble while recovering from anesthesia. Oftentimes, endotracheal tubes placed in brachycephalic breeds are left in place for much longer periods of time compared to longer-snouted dogs.

Unfortunately, many brachys are overweight or obese and must be ventilated while anesthetized. One way to reduce your brachy's anesthesia risk (and increase his overall quality of life) is to keep your pet at a healthy weight.

### Sighthounds

The Greyhound, Whippet, Italian Greyhound, Afghan Hound, Borzoi, Irish Wolfhound and the Saluki are examples of sighthounds. These breeds, especially Greyhounds, metabolize drugs differently than other breeds.

Many anesthetic drugs are absorbed by fat tissues. Since sighthounds tend to be much leaner and more muscular than other breeds, lack of fatty tissues may limit uptake of anesthetic drugs. This means more of the drug is circulating in the bloodstream, which explains why lower dosages are better tolerated by many sighthounds.

Prior to any procedure that requires anesthesia, sighthounds should be tested for cardiac abnormalities like dilated cardiomyopathy. Other considerations for these breeds:

- They tend to experience "white-coat effect" (hospitalization-related stress).
- They metabolize drugs more slowly than other dogs, and sometimes recover more slowly as well. Prolonged recovery is the result of a deficiency of a specific liver enzyme.

- They are at higher than normal risk for hyper/hypothermia while anesthetized because they have only about half the body fat of other dogs. If they are over or under heated, problems can develop very quickly.

## **Herding Breeds**

Herding dogs like the Collie, Border Collie, Australian Shepherd and the Shetland Sheepdog often have a genetic mutation in the ABCB1 (formerly MDR1 for “multi-drug resistance”) gene that allows certain drugs to accumulate in the brain – including some anesthesia agents. Without proper dosing and monitoring, these breeds can be over-sedated and experience respiratory depression.

## **Toy Breeds**

The smaller the animal, the higher the risk when administering any kind of drug, including anesthesia. Small dogs must be carefully weighed and the appropriate dose of anesthetic given based on their size. Monitoring during the procedure is crucial (as it is for all patients, but in particular the tiny ones), including accurate blood pressure measurements.

Small dogs tend to have low body temperatures, so it's important they be kept warm with appropriate heating devices during the procedure and throughout recovery. It can be beneficial to use warmed intravenous fluids rather than cold or room temperature fluids. Body temp should be monitored frequently.

Many tiny dogs are also frequently hypoglycemic (have low blood sugar), so it can be beneficial to add dextrose to intravenous fluids. Blood sugar levels should be monitored before, during, and following the procedure.

## **Giant Breeds**

It may seem to make sense that very large dogs like the Great Dane, for example, are so massive they need higher doses of anesthesia. But actually, giant dogs often respond profoundly – in other words, they over-respond – to normal therapeutic doses of sedatives.

It's important that these dogs are dosed according to lean body mass or surface area rather than actual body weight. In addition, giant breeds age faster than smaller dogs, so it's important to take the age of these dogs into consideration when deciding appropriate anesthesia dosages.

## **Doberman Pinscher**

Dobies have a genetic variation that can cause von Willebrand disease, a problem with blood clotting. They should be evaluated for the condition before any surgery is scheduled. If von Willebrand is suspected, a drug can be given prior to surgery.

Also, the use of NSAIDs (non-steroidal anti-inflammatory drugs) in Dobies with von Willebrand disease is controversial, so other types of painkilling agents should be considered. Dobermans are also predisposed to develop heart disease (cardiomyopathy), as are a number of other breeds, including Boxers, Cocker Spaniels, Great Danes, and Irish Wolfhounds.

These breeds should undergo a pre-anesthetic electrocardiogram (ECG), as well have a continuous ECG while anesthetized and during recovery.

## **Anesthesia Protocols Must Be Customized for Each Pet**

Despite breed-related variations, what's most important is that your veterinarian customizes an anesthesia protocol for your individual dog.

As long as the proper pre-operative workup is accomplished and the pet is appropriately monitored – beginning with premedication and ending only after well-timed extubation – anesthesia can be safe for any breed of dog. Making sure you're partnered with a veterinarian that understands and implements all of these steps, safeguards and precautions is, of course, your responsibility. So don't hesitate to ask a lot of questions!

### **Sources and References**

[Speaking for Spot January 31, 2016](#)

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