

Pets and anesthesia

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Have you been avoiding getting your pet regular dental care? You're not alone. Most pet owners understand that in animals—just as in people—good oral health is conducive to overall well-being, says Gillian Fraser, V00, who practices in Northborough, Mass. Still, she says, some clients don't heed her advice, because they're afraid their pet will not survive the anesthesia.

Many procedures that can be done safely on a human patient who is awake—dentistry, radiation treatment for cancer and X-rays among them—can't be performed on pets without putting them under. In fact, when you think about those sharp dental instruments or about how dogs and cats don't lay perfectly still on command, it's no wonder that "your [pet's](#) odds of needing [general anesthesia](#) over its lifetime are much higher than your own," says Tufts veterinary anesthesiologist Emily McCobb, V00.

Most animals do just fine with anesthesia. Still, it's understandable for pet owners to have some anxiety, says McCobb, who notes that "low risk is still not the same as no risk."

"Because an animal can't tell us if it has been feeling ill" or has another condition that could be dangerous in combination with anesthetic drugs, the chance of an adverse reaction is a little higher for dogs and cats than it is for people, she says.

According to McCobb, 1 out of 1,000 dog or cat patients are at risk of anesthesia complications, compared with 1 in 2,000 to 5,000 patients in

human medicine. She says anesthesia causes the most problems in horses—with 1 in 100 at risk of complications—because they often try to stand up and flee while the drugs are wearing off. Tiny patients also have more issues with anesthesia.

Down Under

Anesthetized humans and animals appear to be sleeping, but there's a lot more going on. When you sleep, you may not be aware of what's happening around you, but you'll likely wake up in response to, say, a loud noise. Because anesthesia drugs take command of the nervous system, "you will not respond to any painful stimuli. You will not respond by movement. You won't remember any of this," says Alicia Karas, V89, a veterinary anesthesiologist at Tufts VETS in Walpole, Mass.

There are, however, side effects associated with this marionette-like control of the nervous system.

When you're awake, your brain automatically adjusts organ functions to control blood flow and avert such serious complications as dehydration. "If you are conscious and very dehydrated, you will faint, which brings your head level with your heart," making it easier for blood to get to the brain, Karas says. Your kidneys will retain fluid to boost blood volume.

But anesthesia depresses brain function. It can no longer direct your body to make such accommodations.

When people undergo surgery, there's an anesthesiologist in the OR whose only job is to manage the patient on the table. In veterinary medicine, dental care and some surgeries are usually done by a general practitioner, who also oversees the anesthesia. At a full-service veterinary teaching hospital, specially trained veterinarians assume roles

identical to anesthesiologists in human medicine, says McCobb, one of four board-certified anesthesiologists on staff at Tufts' Foster Hospital for Small Animals.

For routine procedures, most veterinarians in general practice have a standard protocol that they use on every patient, and they have very good results with that, says McCobb. "It may work well for nine out of 10 patients, which is why they use it," she says. "They refer that 10th patient to us."

Fraser, the general practice vet, refers her patients with advanced cardiac and lung disease to Tufts, because anesthesia stresses those systems. She also refers pets that have had a prior adverse reaction to anesthesia.

"In my practice, we recently had to cut a procedure short because a dog's blood pressure dropped, and we were having trouble keeping it in a safe range, despite our best efforts," says Fraser. "I feel more comfortable having an animal like that anesthetized where you have [a board-certified veterinary anesthesiologist] standing by with a more advanced arsenal of drugs that can keep its blood pressure where we want it to be."

At Tufts, anesthesiologists make adjustments in their protocols depending on a pet's age and health condition, says McCobb. "We don't do one-size-fits-all anesthesia here."

Many dogs and cats have heart murmurs that have never posed a problem, but "if those pets are going to have anesthesia, we want to investigate that further," McCobb says. For example, testing often reveals that cats with heart murmurs suffer from hypertrophic cardiomyopathy, a thickening of the heart muscle that impedes its ability to pump blood. For those cats, the Cummings School has access to anesthetic drugs not available in most general practices that prevent the heart from working too hard while the animal is anesthetized.

Certain breeds also benefit from highly customized anesthesia.

Bulldogs and pugs often have narrowed airways to go along with their adorably short snouts. "They really cannot be treated like other dogs," says Karas, who calls bulldogs the Goldilocks of veterinary anesthesia—"they demand that the depth of unconsciousness be just right," she says. "If they are too sleepy, they may not be able to breathe. If they aren't sedated properly and get too freaked out, they will hyperventilate and not be able to breathe."

Many other canine breeds have genetic issues or anatomic factors that may require special anesthesia planning, including sight hounds, herding breeds, toy breeds, giant breeds and Doberman pinschers.

What to Expect

General anesthesia involves a combination of drugs. To lessen pre-procedure stress, Tufts patients are given a sedative and a pain reliever before anesthesia is administered. Once the animal is relaxed, the anesthesiologist or a supervised veterinary technician will insert an intravenous catheter and inject a drug, often propofol, a short-acting anesthetic also used in human medicine, to render the pet unconscious.

Once the animal is under, the veterinary team inserts a breathing tube to keep the airway open and to deliver an inhaled anesthetic gas, which will keep the pet unconscious during the procedure. The team also monitors the pet's heart rate and rhythm, blood pressure, body temperature, oxygen levels and carbon dioxide output, a key indicator of changes in cardiorespiratory function.

It's also important to maintain an animal's normal body temperature, because if the body temp drops, the patient does not metabolize the anesthetics or wake up properly. Tufts veterinarians use blankets that

recirculate warm water, and warm air blows over patients to prevent them from getting cold. An IV drip keeps pets hydrated and gives veterinarians an easy portal to administer other drugs should an animal need them.

Tufts vets administer pain relievers in addition to [anesthetic drugs](#). "If we can prevent the body from generating pain messages at the time of surgery, the pet will feel that much better afterward," says McCobb. When a procedure is completed, patients move to the recovery area, where they're attended until they awake.

Anesthesia usually is nothing to worry about, and McCobb encourages nervous clients to meet with the veterinary anesthesiologist or veterinary technician before a procedure to discuss their pet's anesthesia plan.

The chance to share her concerns finally gave Cindy Gingrich the confidence to have her greyhound Molly anesthetized for a dental exam. "She is not great, nor am I, with teeth brushing," says Gingrich, of Boylston, Mass. Her veterinarian, Randy Caviness, V93, repeatedly urged her to have the dog's red gums examined. But Gingrich knew that Molly's lack of body fat raised the risk of an adverse reaction to anesthesia.

A long conversation with the veterinary technician who would monitor Molly throughout the procedure allayed her fears. "He took me through the entire process in detail and reassured me that he would be watching Molly the whole time. He also made it clear that he understood greyhounds' particular susceptibility to anesthesia."

Molly did just fine. "As soon as she woke up, they let me know," says Gingrich. "They even called me at home later that night to ask how she was. The whole experience ended up being terrific."

Not So Little Differences

Exotic pets and birds frequently require general anesthesia for routine procedures and diagnostics.

The teeth of rabbits, guinea pigs and chinchillas, for example, grow continuously, which can lead to tooth overgrowth and even painful wounds in cases of a misaligned bite. "These animals often lose a dangerous amount of weight when they stop eating because of tooth pain," says Jennifer Graham, head of Tufts' Zoological Companion Animal Medicine Service. "Some rabbits have to come in as often as once a month for dental trims," a procedure that requires anesthesia.

Because these pets weigh less than dogs and cats, "things can go bad for exotics much faster," she notes.

"A lot of our patients can get hypothermic very quickly," she says. If small pets get too cold, the anesthesia doesn't work or wear off as it should. At Tufts' Foster Hospital, these small patients receive supplemental heat during procedures to keep their temperatures from dropping as quickly. Special heated cages help them recover.

Breathing tubes used to keep dogs and cats' airways open when they're under anesthesia present an obstacle in rabbits, guinea pigs and chinchillas, whose tracheas are positioned at such an angle that inserting a tube is difficult. Using the incorrect tubes also could damage the windpipes of birds and reptiles, which have tracheas that don't expand. And many of Graham's tiny patients have veins so small that placing a catheter for IV drugs can be difficult.

To anesthetize guinea pigs, chinchillas, rats, mice, hedgehogs and other small mammals—and keep them breathing—she administers anesthetics and oxygen through a snug-fitting mask over their muzzles.

Reptiles are another challenge. "They stay asleep a really long time—up to three days" after anesthesia, says Graham. For her scaly patients, she may administer a shorter-acting drug along with gas anesthesia for longer procedures.

Tufts veterinarians often space out surgical care for birds over several procedures to limit their sedation time to under what they call "the golden hour"—after which the risk of complications and death jumps exponentially. "A dog might be under anesthesia for four or five hours for an orthopedic procedure," says Graham. "You just can't do that with a bird and have a good outcome."

Anesthesia Survival Guide

Before your pet undergoes general anesthesia:

- Share your concerns with your veterinarian. Be sure to mention signs of exercise intolerance (fatigue or panting). Ask whether your pet's health or breed requires specialized anesthesia.
- Learn how your pet will be cared for before, during and after the procedure. How will your pet's stress be managed? Who will check vital signs and how often? Will someone be with your pet during recovery?
- Find out when you need to take away food. Most veterinarians recommend no food after midnight to reduce the risk of vomiting under anesthesia and because it's easier to breathe without a stomach full of food. Certain pets, including diabetics and very young animals, may not be able to fast that long.
- Ask when to expect a phone call. Veterinarians typically want their [patients](#) to arrive early the day of the procedure so they can examine them before heading into the operating room for the day. This allows the veterinary team to move smoothly from procedure to procedure, without having to stop to evaluate new

arrivals. Many animal hospitals will call you once your pet has awakened.

After your pet wakes up:

- Be sure you understand and follow the discharge instructions. Most pets that have surgery go home on pain medications, so make sure you're aware of possible side effects.
- Give your pet a couple of days to fully recover. Usually, pets are pretty drowsy the first night after anesthesia, and many have no interest in food. Your pet likely will be much closer to normal the next morning and back to normal by day two, although that depends somewhat on the procedure and how long your pet was under.

Provided by Tufts University

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