



# Heartworm Disease in Cats

- Heartworm disease attacks the lungs, heart, and related blood vessels. It is serious and potentially fatal.
- Heartworms are transmitted through the bite of an infected mosquito.
- There is no approved treatment for heartworm disease in cats.
- Illness is easily and effectively avoided by giving preventive medications.

## What Is Heartworm Disease?

Heartworm disease is a serious and potentially fatal condition that affects dogs, cats, and up to 30 other species of animals. It is caused by parasitic worms (heartworms) living in the major blood vessels of the lungs and, occasionally, in the heart. These worms are transmitted (as microscopic larvae) through the bite of an infected mosquito. The scientific name for the heartworm parasite is *Dirofilaria immitis*.

Despite the fact that heartworm disease is virtually 100% preventable, many cats are diagnosed with it each year. However, diagnosis is more difficult in cats than in dogs, so it is likely that many cats have heartworm disease that is not recognized. Although cats are considered resistant to heartworms and sometimes can fight off an infection on their own, heartworm disease can still be a serious health problem for cats, resulting in significant illness and even

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# Heartworm Disease in Cats *continued*

death. Keeping a cat indoors does not prevent infection. Multiple studies have shown that more than 25% of heartworm-infected cats live indoors.

The American Heartworm Society (AHS) estimates that one million dogs in the United States have heartworm disease today, and this number may be rising. Wherever dogs are infected, studies have shown that cats are likely to be infected, too.

## Diagnosis

Heartworms are spread through the bite of a mosquito, and dogs serve as the source of infection for other dogs and for cats. When a mosquito bites an infected dog, it withdraws blood that contains immature heartworms (called microfilariae [pronounced micro-fill-air-ee-ay]). These microfilariae mature inside the mosquito to become infective larvae. When the mosquito eventually bites another dog or a cat, the larvae enter the new host. In dogs, these larvae often mature to become adult heartworms, which produce more microfilariae and continue the heartworm's life cycle.

The life cycle of heartworms in cats is slightly different from the life cycle in dogs. For example, many heartworms die during development in a cat, so they don't live long enough to produce microfilariae. Additionally, the immune system of some cats can eliminate the heartworm infection before the worms reach adulthood. For these reasons, heartworm testing in cats is more complicated than the process in dogs. Many types of tests conducted on different occasions may be necessary. Negative test results do not necessarily rule out heartworm infection,

and positive results (depending on the test) do not always confirm infection.

Many veterinarians use heartworm antigen and/or antibody tests to begin the screening process for heartworm disease in cats. Each of these tests has strengths and limitations, and neither test will, by itself, identify heartworm disease in all infected cats:

→ **Antibody testing:** "Antibodies" are specific proteins that the body produces in response to invasion by a foreign organism. Heartworm antibody tests detect antibodies produced by a cat in response to the presence of developing heartworms (heartworm larvae). A positive result on an antibody test could indicate an early infection or a previous infection (that the cat's immune system already eliminated), but not necessarily a current one. In fact, many antibody-positive cats do not have adult heartworms. Additionally, some cats with heartworms don't produce antibodies the whole time they are infected, so a cat that has a mature (adult) infection may actually test negative on an antibody test.

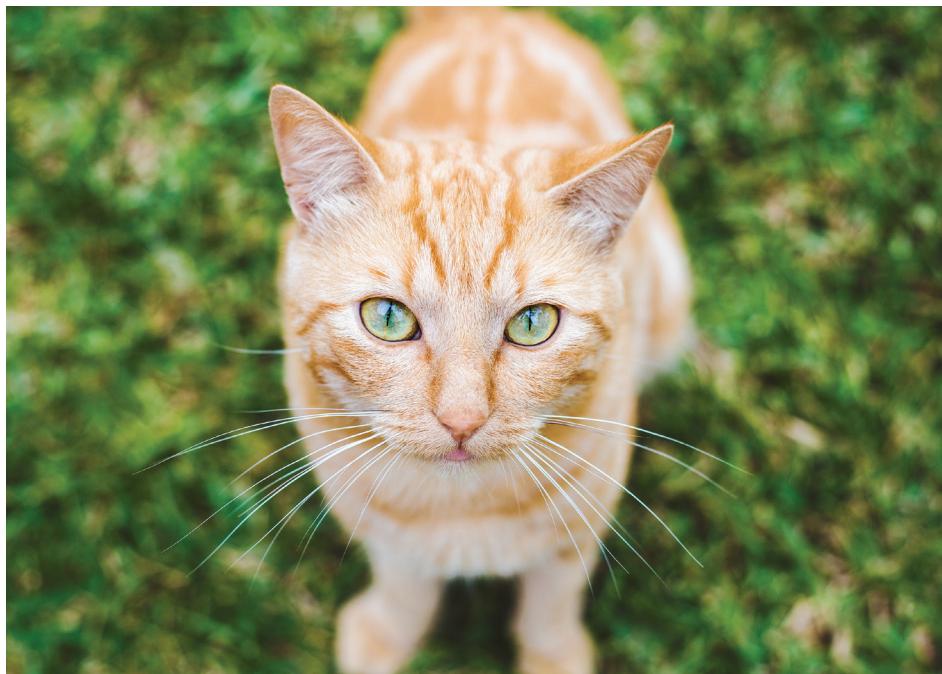
→ **Antigen testing:** "Antigens" are proteins that the body can recognize as belonging to a foreign organism. By identifying certain antigens that are found in adult female heartworms, researchers have developed tests that can detect these antigens to tell if a cat is infected with adult heartworms. Many veterinarians use a rapid-result test called a "SNAP" test to begin diagnosing heartworm disease in cats. The SNAP test is very accurate, can be performed in your veterinarian's office using a very small amount of

## Signs of Heartworm Disease

Cats usually have fewer heartworms than dogs, and the worms may not grow as big. However, because cats are generally smaller than dogs and have smaller blood vessels, the presence of even a few worms can cause lung damage. Some cats with heartworm disease never show any signs. When present, the signs of heartworm infection in cats can be confused with signs of many other diseases, including feline asthma. Affected cats may vomit, cough, and have difficulty breathing. This condition is called heartworm-associated respiratory disease (HARD). Sometimes, the only sign of infection is sudden death.



# Heartworm Disease in Cats *continued*



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Keeping a cat indoors does not prevent infection. Multiple studies have shown that more than 25% of heartworm-infected cats live indoors.

blood, and takes only a few minutes to complete. There is even a combination SNAP test that can detect heartworm disease as well as feline leukemia virus (FeLV) and feline immunodeficiency virus (FIV) at the same time. The feline heartworm antigen test only identifies the antigen associated with adult female heartworms. Therefore, it will not detect an infection when only larvae are present or when only adult male heartworms are present. If your veterinarian obtains a questionable result on the SNAP test, additional testing may be recommended.

Some veterinarians use an outside laboratory to perform feline heartworm antibody and/or antigen testing. In these cases, results are generally available within a few days.

Diagnosis of feline heartworm disease may involve other types of diagnostic tests besides blood

work. Sometimes, evidence of heartworms can be seen on ultrasound images or radiographs ("x-rays") of the heart and lungs. Unfortunately, these tests can also be inconclusive.

## Treatment

In cats, there is no real treatment for heartworm disease itself. Your veterinarian will determine how to monitor your pet and manage the signs of disease. In some cases, surgical removal of the worms may be recommended. However, this surgery is costly and has some risks.

## Prevention

Safe, easy-to-give, effective medications are available to prevent heartworm disease. These monthly oral or topical ("spot on") medications are inexpensive compared with the dangers of the disease for your cat. Ask your veterinarian which method and schedule of heartworm prevention are best for you and your pet. ■



# Puppy Socialization

- Socialization is the learning process through which puppies become accepting of interactions with various people and animals.
- Localization is the learning process through which puppies become familiarized and accustomed to various novel objects and environments.
- Proper socialization can help prevent or eliminate behavior problems and help create a better bond between the dog and the family.
- When introducing puppies to new people, animals, or environments, provide treats proactively so the puppy associates a positive experience with each new stimulus.
- It's important for puppies to be socialized around other people and other pets at an early age (before they are fully vaccinated), but consult your veterinarian about disease risks before exposing your puppy to novel environments and other dogs with an unknown vaccine history.
- Group puppy socialization classes are a good way to socialize your puppy while minimizing disease risks, and they provide access to a training expert for guidance.

## What Is Puppy Socialization?

Socialization is the learning process through which puppies become accepting of interactions with various people and animals. Socialization includes localization and allows puppies to become familiar with and accustomed to various novel objects and environments. Socialization is easiest during the sensitive socialization period, or the first 3 months of a puppy's life. From 3 to 4 months of age, the socialization period wanes and puppies become progressively more fearful, especially in the absence of early positive socialization experiences. By exposing puppies to different stimuli in a positive way (using food treats) before they are fearful, puppy parents can reduce the likelihood of behavior problems in the future and can help to build a stronger human-dog bond.



## Why Is Puppy Socialization Important?

Unfortunately, behavior problems remain the top reason that pets are relinquished to animal shelters or worse. Likely, many behavior problems can be prevented with early and appropriate socialization. Proper socialization helps make puppies more tolerant of changes in their environment and helps prevent common behavior problems related to fear, anxiety, and/or aggression. Lack of early proper socialization experiences can be just as detrimental as negative experiences for your puppy. Early socialization optimizes the chances for a dog to be friendly and well adjusted in a multitude of environments later in life.

## Why Should I Consider Attending Group Puppy Preschool Socialization Classes?

Group puppy preschool socialization classes can be a safe and controlled

# Puppy Socialization *continued*

## The benefits of attending group puppy preschool socialization classes include:

- Empathy and understanding regarding normal behaviors
- Expert guidance and answers to questions or concerns regarding undesirable behaviors
- Introduction to positive reinforcement training
- Knowledge of how to implement problem-solving techniques
- Prevention of behavior problems related to fear, anxiety, and aggression
- A controlled and safe environment for puppy play, socialization, and exploration during sensitive periods of development

place for socialization to other puppies and people, and they allow for the exploration of novel objects and environments. Reputable puppy classes will maintain strict health, vaccination, and disease risk management protocols, thereby minimizing health risks.

Attending a group puppy preschool socialization class led by a training specialist has several advantages.

Group puppy preschool socialization classes are offered by many veterinary clinics, dog training facilities, and pet supply stores. It's important to find a course that emphasizes pet parent education and positive controlled socialization experiences and exploration. Classes should highlight appropriate management and supervision and emphasize positive reinforcement training rather than punishment or correction. Enrollment should begin during the sensitive socialization period (the puppy's first 2 to 3 months of life). Older puppies

outside their socialization period should be enrolled in group puppy kindergarten classes with age-appropriate activities and positive reinforcement training.

Ask your veterinarian for recommendations regarding group puppy preschool socialization classes and for positive puppy training resources. Your veterinarian can help you determine when your puppy is ready for class.

Among other things, good group puppy preschool socialization classes should cover:

- Proper socialization and environmental exposure
- Play biting and mouthing
- Destructive chewing
- Prevention of food and resource guarding
- Crate training and exercises fostering independence
- Handling and restraint exercises
- Housetraining tips and techniques
- Basic training for good manners



Kenneth Martin, DVM, DACVB, puppystartright.com

# Puppy Socialization *continued*



Kenneth Martin, DVM, DACVB, [puppystartright.com](http://puppystartright.com).

## How Else Can I Socialize My Puppy?

The goal of proper socialization is to expose your puppy to different people, animals, environments, and stimuli in a safe and positive manner, without overwhelming your puppy.

Start by familiarizing your puppy with touch and handling by familiar people. Whenever possible, when handling your puppy's paws, ears, mouth, and body, offer special food treats. This helps to foster positive associations with being handled rather than just learning to tolerate it, or worse, becoming overly sensitive to handling.

Next, in a positive manner, using food treats, expose the puppy to people of different ages, sexes, heights,

and races. If your puppy is enjoying the social interaction, he or she will readily eat the treats and/or display affection with a desired interest in social interaction. It is important for your puppy to become comfortable with being handled by others at the veterinary clinic or grooming facility. Adding food to social interactions helps foster positive associations.

It's also important for your puppy to learn to be comfortable around other animals. Group puppy preschool socialization classes are a safe place to expose your puppy to other puppies because health and vaccination requirements should be mandatory for all participants. If your puppy is older, consider group puppy kindergarten classes.

In general, you should avoid taking your puppy to a dog park or other high-traffic public area where unfamiliar dogs roam. These experiences should be off-limits until your puppy has been fully vaccinated. Exposing your puppy to an infectious disease, such as parvovirus, when his or her immune system is still developing can have devastating results.

Puppyhood is also a great time to familiarize your puppy with all the sights and sounds of his or her world, from riding in a car to being around a vacuum cleaner. Once your puppy has been fully vaccinated, you can expand your destinations as the risk of infectious disease is greatly reduced. Each time you introduce your puppy to a new stimulus, make sure to provide positive reinforcement in the form of treats. You want your puppy to associate positive experiences with new people, animals, and environments. ■



# Common Household Poisons

- Many common food items or household products can sicken or even kill animals.
- Be aware of what substances may be toxic to your pet, and store and use them safely.
- If you think your pet has eaten something poisonous, call your veterinarian or an animal poison hotline immediately.

## The Basics

Your home can hold a lot of unrecognized dangers for your pet. However, a few simple precautions can help keep your pet safe.

Pets are not "mini people." Animals react to substances in food and medicines differently than people do, so just because something doesn't make a person sick doesn't mean it is okay for a pet. Also, most pets are much smaller than people, so what may seem like a harmless amount of a food or drug can make them ill.

Pets are curious. If something smells good, they'll eat it. If they can get into a container, they will. Be aware of what substances may be toxic to your pet, and store and use them safely.

## Chocolate

If you suspect that your pet has consumed any amount of any chocolate, call your veterinarian. However, not all chocolate is equally dangerous to pets. In general, the darker the chocolate, the more toxic it is to animals. Baker's chocolate and cocoa powder are the most dangerous because they contain the highest concentration of substances called *methylxanthines*. Pets that eat too much of these substances can have vomiting, diarrhea, excessive thirst and urination, hyperactivity, and in severe cases, increased heart rate, abnormal heart rhythms, tremors, and seizures.

## Other Food

It is generally not a good idea to give your pet table food. Many human foods can cause digestive upset or pancreatitis, which can be severe. Even if the food is not known to be toxic, it can still contain mycotoxins, which are substances produced by mold that can cause neurologic signs. Also, several common ingredients in human food can be toxic to pets. Just a few are:

- Avocados
- Grapes and raisins. These are sometimes recommended as treats for dogs. However, cases of serious kidney damage have been reported in dogs, cats, and ferrets that consume them.
- Macadamia nuts
- Onions, garlic, and chives



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## Top 10 Pet Poisons

The ASPCA Animal Poison Control Center handles more than 180,000 cases of pet poisonings every year. Based on those cases, the top 10 offenders are:

- Over-the counter medications
- Human prescription medications
- Insecticides
- Human foods
- Household items (e.g., cleaning products, fire logs, paints)
- Veterinary medications (e.g., wrong medication, wrong amount, wrong animal)
- Chocolate
- Plants
- Rodenticides
- Lawn and garden products

# Common Household Poisons *continued*

## In an Emergency...

If your pet does eat something he or she shouldn't, time is critical. Call your veterinarian or an animal poison hotline immediately and be prepared to describe the following:

- What your pet ate
- How long ago
- How much

The ASPCA Animal Poison Control Center's hotline number is **888-426-4435**. The Pet Poison Helpline number is **855-764-7661**. (Note: Callers will be charged a consultation fee.)

If possible, bring some of the substance, including any available packaging, with you if you are asked to bring your pet in for an examination.



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- Xylitol. This is a common sugar-free sweetener, often found in chewing gum, foods (including peanut butter), dental products, and medications and supplements. Xylitol can lower the blood sugar in the body and cause life-threatening liver failure.
- Yeast dough
- Some beverages, such as coffee and alcohol

In general, do not store or leave food meant for you and your family in a place where your pet may be able to get to it. Take special care during holiday seasons and festive occasions, when it is very easy to become distracted and leave food or drinks on a counter or coffee table.

## Medicines

Never give your pet a medicine meant for people unless you've been told to by a veterinary professional. Many common over-the-counter drugs can be extremely toxic to pets. Don't leave medicine bottles out where pets can reach them (a determined dog can chew through a childproof cap), and pick up any dropped pills immediately. Use the same caution with dietary supplements or with products you buy at a health food store.

## Cleaning Products

Read the warning labels on the household cleaning products you use, and store as directed.

## Outdoor Hazards

If you have a garage, shed, or garden, you probably have at least some of the following:

- **Plants:** Learn which plants can be toxic to pets and under what circumstances. Tomatoes, for example, are in the nightshade family. Many lilies, flowers, and common ornamental shrubs can be toxic. The American Society for the Prevention of Cruelty to Animals (ASPCA) maintains a comprehensive online list ([www.aspca.org/apcc](http://www.aspca.org/apcc)).
- **Pest poisons:** Poisons meant to kill rodents, insects, or weeds are very common causes of poisoning in pets. Be very careful how you apply and store any poisons around your home.
- **Garden products:** Cocoa mulch, fertilizers, and compost piles are also unsafe for pets. Make sure any mulch or fertilizer you apply to your yard is safe for pets to play in (and possibly eat). Keep your pet out of areas treated with toxic products. Compost piles can grow bacteria and fungi that are highly toxic to pets, so if you have a compost pile, make sure your pet cannot get into it, and don't compost dairy or meat items.
- **Garage chemicals:** Any chemical in your garage can be dangerous to pets. Antifreeze, in particular, can be deadly. Store all chemicals out of reach of your pet (just as you would for children), and carefully mop up any spills. ■



# Canine Urine Marking

- Urine marking is a natural, instinctive behavior in dogs, but it becomes inappropriate when dogs urinate in the house.
- Urine marking is most common with sexually intact male dogs, but intact female dogs and neutered dogs may also mark.
- Underlying medical reasons for inappropriate urination, such as urinary tract infections, should be ruled out before a diagnosis of marking behavior is made.
- In one study, neutering was found to resolve the problem of urine marking in about half of cases. Urine marking issues can be more difficult to resolve in dogs that are not neutered.
- Behavior modification, environmental treatment, and elimination of anxiety triggers can help to eliminate the behavior. To remove urine odor completely, odor eliminators with enzymes or bacteria must be used to clean up urine marks.

## What Is Canine Urine Marking?

Canine urine marking is a natural, instinctive behavior in dogs, but it is not appropriate inside the house. Dogs, especially sexually intact male dogs, urinate on objects to leave a message for other dogs (e.g., claiming their territory). Urine marking behavior usually begins when the dog reaches sexual maturity.

## What Causes Canine Urine Marking?

An intact male dog is most likely to mark when there is a female dog in heat nearby. Intact female dogs are also prone to mark when they are in heat. New items are frequent targets for urine marks. However, because urine marking is a form of communication, any dog may mark if another dog has urinated anywhere in the house. Unless the scent of the urine is completely removed, the marking behavior is likely to continue. Use odor eliminators with enzymes or bacteria in them to completely remove the odor.



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Any anxiety-producing situation can trigger urine marking as well. Workmen in the house, the arrival of a new baby, or visiting relatives can all produce anxiety in a dog. Even the addition of a new TV or a new computer may threaten a dog so that it feels compelled to mark the packing boxes. Rest assured, your dog is not trying to get back at you. It's just doing what comes naturally.

## How Is Canine Urine Marking Diagnosed?

Your veterinarian will start by discussing when, where, and how often the behavior occurs. A workup should be conducted to rule out medical disorders that may be causing the problem. If there are no medical causes, your veterinarian will need to determine if incomplete housetraining or other behavioral conditions are playing a role. Even if there is a medical component to the behavior, there will be a learned aspect as well. This learning may need to be modified once the medical condition is resolved.

# Canine Urine Marking *continued*

## How Can It Be Treated?

In most cases, overcoming urine marking requires multiple steps:

**Neutering.** If the dog is sexually intact, neutering is the first step to remove any hormonal influence for the urine marking behavior. Once the surgery is performed, behavior modification can begin to reinforce urine marking in acceptable locations.

**Scent elimination.** It is important to remove the scent of previous urine marks with a good enzymatic or bacterial cleaner. Camouflaging the odor with another scent is not effective. An enzymatic cleaner can help neutralize the scent to prevent recurrences of the behavior. Many dogs won't urinate where they eat, so you can also try feeding your dog in the location it used to mark.

**Positive reinforcement.** Never punish a dog for urine marking. Punishment can create more anxiety, which may only exacerbate the problem. Instead, you need to supervise your pet closely. If you see the dog starting to eliminate inside, interrupt him or her by asking for a competing behavior like come or sit. Then bring the pet outside. When the dog urinates outside, reward him or her with praise and treats. Make sure to bring your dog outside frequently, always providing rewards for appropriate urination outdoors.

**Confinement.** During retraining, it helps to limit your dog's access to frequently marked areas. You may need to confine your dog to a room or small area by shutting doors or by using baby gates or a crate. You can also use a technique called

the "umbilical cord," in which you use your dog's leash to keep your dog close to you while inside so that you can better monitor his or her behavior. As your dog's behavior improves, you can gradually increase his or her freedom in the house. Be careful to frequently exercise your dog to keep him or her from becoming agitated with long periods of confinement.

**Minimize anxieties.** If you can identify the factors that are causing your dog anxiety, remove them or minimize their importance. With a new baby, for example, you can desensitize your dog by gradually increasing the amount of time your dog is exposed to the new baby. At the same time, you can use tactics known as *counterconditioning techniques*. These include *classical counterconditioning*, such as associating the baby with items your dog wants, like food, petting, and praise, and *operant counterconditioning*, which involves reinforcing calm behaviors such as "sit" and "down" to replace excited behaviors like jumping up and mouthing when near the baby.

You may also consult your veterinarian about an Adaptil (dog appeasing pheromone) diffuser. By mimicking the pheromones produced by a mother dog to give her puppies a sense of calm and well-being, this product can help ease anxieties in dogs.

**Medications.** If your dog has a high level of anxiety, you can consult your veterinarian for medications. There are many types of appropriate medications to address anxiety in dogs. These drugs may take 4 to 6 weeks to make a difference. However, behavior modification is always the first choice and should continue, even with medications. ■

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# Dental Care

- Most dogs and cats develop periodontal (dental) disease by 3 years of age.
- Periodontal disease is the most common health problem in dogs and cats.
- Bad breath may be a sign of periodontal disease in your pet.
- Providing routine dental care for your pet can be easy and can benefit your pet's oral and overall health.

## What You Need to Know

Bad breath in pets may be a sign of periodontal disease that could lead to other health problems. Periodontal disease starts when plaque (a bacterial film) coats the tooth. Plaque hardens (calcifies) into tartar, a thick yellow or brown layer on the teeth. Tartar can irritate the gums, creating an environment where bacteria thrive. As the disease progresses, the gums become tender, red, and swollen and the bacteria continue to multiply. Eventually, the inflamed gums pull

away from the teeth, creating pockets that trap more bacteria and food particles. The gums bleed, the roots of the teeth may become exposed, teeth may become loose, and your pet may feel pain when eating. If the bacteria enter the bloodstream, they can create problems for organs such as the heart, liver, and kidneys.

## What to Do

Your pet needs routine dental care from your veterinarian and you. Regular veterinary checkups are essential for



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## Dental Care *continued*



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### Ways to Prevent Periodontal Disease in Your Pet

- Take your pet to annual veterinary checkups.
- Brush your pet's teeth or use plaque-reducing products at least a few times a week.
- Feed dry food.
- Provide plaque-reducing foods, treats, and toys.



helping your veterinarian monitor your pet's dental health, but don't wait for a checkup if you suspect a problem. After an examination, your veterinarian may recommend a dental cleaning for your pet. Anesthesia and pain medication are used for dental procedures. If dental disease is severe, your veterinarian will recommend the best treatment, which may include tooth extraction.

Pets are never too young to start having their teeth brushed at home; in fact, the younger they are, the better. Slowly and gently introduce your pet to toothbrushing. It should be a bonding experience that is reinforced with praise and rewards. Begin by rubbing your pet's teeth and gums with soft gauze wrapped around your finger. Gradually switch to using a specially designed pet toothbrush or baby toothbrush with pet toothpaste (do not use toothpaste for people because it is not safe to swallow). If your pet is most at ease on

your lap, keep his or her toothbrush next to the chair where you sit together. Focus on your pet's gum line, and work up to 30 seconds of brushing for each side of the mouth at least a few times a week. If your pet won't tolerate brushing, your veterinarian can recommend plaque-preventive products for your pet.

There's no substitute for regular brushing, but feeding dry food can help keep your pet's teeth and gums in good condition. In addition, special plaque-reducing foods, treats, and toys can help. The Seal of Acceptance from the Veterinary Oral Health Council appears on products that meet defined standards for plaque and tartar control in dogs and cats. Ask your veterinarian for recommendations.

Caring for your pet's teeth can have several benefits. For example, a few minutes of brushing each week can help give your pet a happier, healthier life. ■



# Dental Cleaning

- Most pets have periodontal disease by the time they are 3 years of age.
- Dental disease can result in bad breath, painful chewing, and tooth loss.
- Bacteria under the gum can travel to the heart, kidneys, and liver.
- A professional dental cleaning is required to remove plaque and tartar from a pet's teeth and to assess the health of the mouth.
- A thorough dental cleaning requires that the pet be under anesthesia.
- Regular, at-home dental care can help improve the health of your pet's mouth and lengthen the intervals between professional dental cleanings.

Most pets have periodontal disease by the time they are 3 years of age. Periodontal disease is a progressive disease of the supporting tissues surrounding teeth and the main cause of early tooth loss.

Periodontal disease starts when bacteria combine with food particles to form plaque on the teeth. Within days, minerals in the saliva bond with the plaque to form tartar, a hard substance that adheres to the teeth. The bacteria

work their way under the gums and cause gingivitis—*inflammation of the gums*. Once under the gums, bacteria destroy the supporting tissue around the tooth, leading to tooth loss. This condition is known as *periodontitis*. Gingivitis and periodontitis make up the changes that are referred to as *periodontal disease*. The bacteria associated with periodontal disease can also travel in the bloodstream to infect the heart, kidneys, and liver.



# Dental Cleaning

*continued*

## How Do I Know if My Pet Needs a Dental Cleaning?

Regular inspection of your pet's mouth is important to catch dental disease in the early stages. Tartar may appear as a brownish-gold buildup on the teeth, close to the gum line. Redness or bleeding along the gum line may indicate gingivitis. Other signs of dental disease include:

- Bad breath
- Drooling
- Pawing at the mouth
- Difficulty chewing
- Loose or missing teeth

If you notice any of these signs in your pet, schedule an appointment with your veterinarian.



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A professional veterinary dental cleaning is the best way to remove tartar from the teeth and under the gum tissue to protect your pet's health. With a professional dental cleaning and follow-up care, gingivitis is reversible. Periodontal disease is not reversible, but diligent at-home dental care and regular veterinary cleanings can slow down the progression of the condition.

## What Is a Dental Cleaning?

During a dental cleaning, (1) plaque and tartar are removed from a pet's teeth and (2) the health of the entire mouth (tongue, gums, lips, and teeth) is assessed.

A thorough dental cleaning can be accomplished only while the pet is under general anesthesia. Anesthesia keeps your pet free of pain during the dental procedure and allows your veterinarian to fully inspect the teeth and remove tartar from under the gums. During anesthesia, a soft plastic tube is inserted into the trachea (the main airway in the throat) to support the patient's breathing.

A dental cleaning may include:

- Removal of visible plaque and tartar from the teeth
- Elimination of plaque and tartar from under the gum line
- Probing of dental sockets to assess dental disease
- Polishing to smooth enamel scratches that may harbor bacteria
- Dental radiographs (x-rays) to evaluate problems below the gum line
- Application of fluoride or a dental sealer
- Removal or repair of fractured or infected teeth
- Dental charting so progression of dental disease can be monitored
- Inspection of the lips, tongue, and entire mouth for growths, wounds, or other problems

## What Are the Benefits of a Dental Cleaning?

A professional dental cleaning removes not only the visible plaque and tartar on the teeth surfaces but also the bacteria under the gums. This helps to eliminate potential sources of infection to the mouth and other organs and to protect your pet from pain and tooth loss.

## What Can I Do to Keep My Pet's Teeth Clean?

Once a dental cleaning has been performed, you can take a number of steps at home to keep your pet's teeth clean and lengthen the intervals between dental cleanings.

Your veterinarian may recommend a plaque prevention product—a substance that you apply to your pet's teeth and gums on a regular basis. The product adheres to the surface of the teeth to create a barrier that helps prevent plaque from forming.

Just as in people, daily brushing can help remove food particles from between your pet's teeth. You can use a child's toothbrush or purchase a finger brush from your veterinarian. Human toothpastes should be avoided because they contain ingredients that should not be swallowed by your pet. Your dog or cat may like the taste of pet toothpaste, which is available in flavors such as chicken, seafood, and malt.

Several dental diets and treats can also help keep plaque and tartar to a minimum. The diets tend to have larger kibbles to provide abrasive action against the tooth surface when chewed, or they may contain ingredients that help prevent tartar mineralization. Ask your veterinarian which diets or treats are appropriate for your pet. ■

# Feline Urine Marking

- Feline urine marking is a normal form of communication between cats. It is usually related to stress. Cats do not typically use urine marking to claim territorial boundaries.
- Urine marking occurs most commonly in male cats that have not been neutered.
- A cat that is urine marking typically stands upright with its tail erect and sprays a small amount of liquid on walls and other vertical surfaces. However, other postures may be seen.
- A diagnosis is made once other medical and behavioral reasons for urinating outside the litterbox have been ruled out. If a cat has learned to urinate outside the litterbox due to a medical issue, behavior modification will be needed in addition to medical treatment.
- Neutering or spaying the cat is the most effective initial treatment.
- Other treatment includes methods to reduce stress in the cat's environment. Medication can be added if your veterinarian feels it is necessary.

## What Is Feline Urine Marking?

Feline urine marking is a behavior in which cats mark a location with urine to reduce their stress. Often, it occurs near doors and windows as a way to communicate to neighborhood tomcats wandering through the yard. Although this is a normal behavior in cats, most owners consider it unacceptable when it occurs in the house. Any cat can exhibit marking behaviors, but male cats that have not been neutered tend to mark more often. Urine marking is most often seen in multicat households.

Although sex hormones may be behind some urine marking, stress and anxiety also are causes. Any changes in the household, such as the addition of other pets, workers in the house, or a recent vacation by the owner, may compel the cat to become stressed and urine mark.

## What Are the Signs of Urine Marking?

A cat that is urine marking typically stands upright with its tail erect and sprays a

small amount of liquid on walls and other vertical surfaces. However, other postures may be seen, and marking cats may spray on horizontal surfaces or items, such as bedding or laundry.

## How Is Urine Marking Diagnosed?

Your veterinarian will probably want to check a urine sample to make sure that your cat doesn't have a medical reason for urinating outside the litterbox. If the urinary tract is inflamed, infected, or irritated by urinary crystals, there are treatments that can relieve the signs and encourage the cat to return to the litterbox. Some other medical conditions, such as bladder stones, hyperthyroidism, diabetes, and kidney or liver disease, also can cause a cat to urinate outside the litterbox. Your veterinarian may recommend additional tests, such as blood work and x-rays, to investigate these and other possibilities.

There may be other reasons why your cat is eliminating outside the litterbox.



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## Feline Urine Marking *continued*

The most effective initial treatment for urine marking is to neuter or spay your cat, if it has not been done already.

Cats are fastidious creatures, and may avoid the box if it is not clean enough, if they don't like the scent or texture of the litter, or if the box is located near a high traffic area in the house.

Once other causes of inappropriate elimination are ruled out, a diagnosis of feline urine marking may be made.

### How Is Urine Marking Treated?

The most effective initial treatment for urine marking is to neuter or spay your cat, if it has not been done already. However, once the behavior has been learned, behavior modification may be needed even after neutering or treatment for a medical disorder.

Reducing stress in the cat's environment may also help. Ask your

veterinarian or a member of the veterinary staff who specializes in behavior for recommendations on resources to help you understand what may be causing your cat stress. Synthetic pheromone products (e.g., Feliway) are available in spray or plug-in diffuser forms. These products have a calming effect on many cats and may reduce the cat's response to stressors.

To discourage neighborhood cats from approaching doors and windows, consider using a spray deterrent that is activated by motion detectors. You also should supply your cat a place to escape from children or other pets in the household, such as a room, cubby, or perch. Anti-anxiety medications may be appropriate in some cases. ■



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# Heartworm Disease in Dogs

- Heartworm disease attacks the lungs, heart, and related blood vessels. It is serious and potentially fatal.
- Dogs are highly susceptible to heartworm. Nearly all exposed dogs will become infected. Heartworm is endemic in all 50 states.
- Heartworm disease is transmitted through the bite of an infected mosquito.
- Treatment can be costly and complicated.
- Illness is easily and effectively avoided by giving preventive medications.

## What Is Heartworm Disease?

Heartworm disease is a serious and potentially fatal condition that affects dogs, cats, and up to 30 other species of animals. It is caused by parasitic worms (heartworms) living in the major blood vessels of the lungs and, occasionally, in the heart. These worms are transmitted (as microscopic larvae) through the bite of an infected

mosquito. The scientific name for the heartworm parasite is *Dirofilaria immitis*.

Heartworm disease can cause a variety of medical problems affecting the lungs, heart, liver, and/or kidneys. Any of these problems, alone or in combination, can lead to death. Although safe and effective treatment is available, it can be a costly and complicated process depending on how long the dog has been infected and how severe the infection is.

Despite the fact that heartworm disease is virtually 100% preventable, many dogs are diagnosed with it each year.



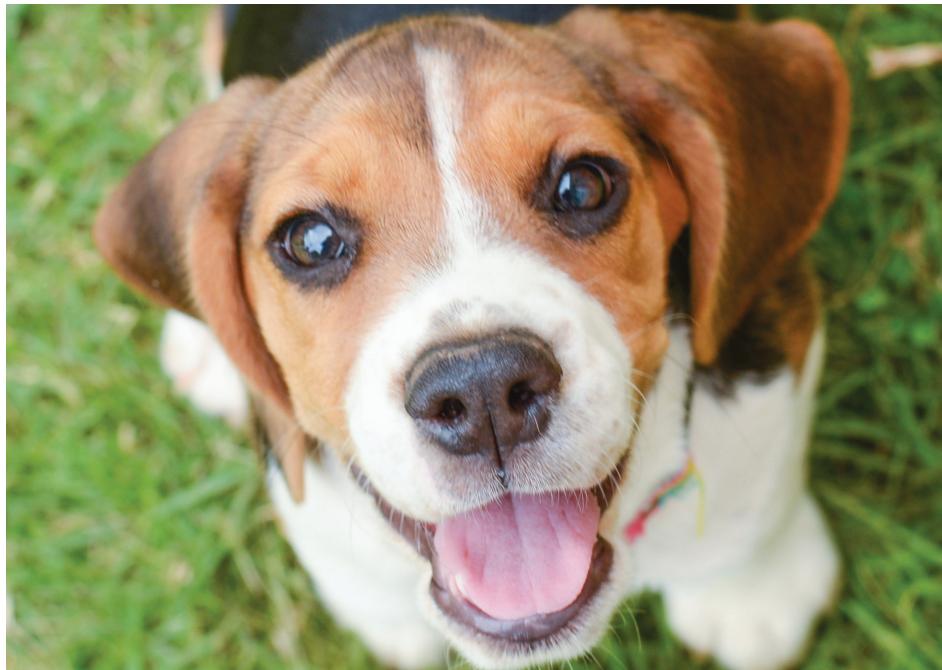
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# Heartworm Disease in Dogs *continued*

## Signs of Heartworm Disease

Some dogs may show no signs of infection. However, depending on the number of worms and the duration of infection, dogs may begin to show the following clinical signs:

- Persistent cough
- Lethargy (tiredness)
- Difficulty in exercising
- Loss of appetite and weight loss
- Swollen abdomen



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Despite the fact that heartworm disease is virtually 100% preventable, many dogs are diagnosed with it each year. The American Heartworm Society (AHS) estimates that one million dogs in the United States are infected with the disease today, and this number may be rising.

## Diagnosis and Treatment

Apart from clinical signs, heartworm disease can be diagnosed using laboratory tests that check the dog's blood for evidence of infection. These tests are accurate but can sometimes produce false-negative results.

Ultrasound images and radiographs ("x-rays") can also sometimes show evidence of heartworms in the heart or lungs.

If infection is detected early enough, heartworm disease can be treated before permanent damage to the heart, lungs, and blood vessels occurs. However, if the infection has been

present for a long time or consists of a large number of worms, the risk of complications increases. In these cases, treatment can be more expensive and complicated, and dogs may take many months to recover from the infection. Hospitalization may be required.

Untreated heartworm disease can be fatal.

## Prevention

Safe, easy-to-give, effective medications are available to prevent heartworm disease. The American Heartworm Society recommends that dogs be kept on heartworm preventive medications year-round. Some medications are given monthly and are either applied to the skin (topical or "spot on" medications) or given as a pill or treat. One product can be injected by your veterinarian every 6 months. Ask your veterinarian which method and schedule of heartworm prevention are best for you and your pet. ■



# Brushing Your Cat's Teeth

- Periodontal disease can lead to tooth loss and affects most cats by the time they are 3 years old.
- Depending on your cat's overall health, bacteria from periodontal disease can spread to affect other organs.
- Have your cat's teeth checked by your veterinarian before you start brushing them.
- Make toothbrushing enjoyable for your cat by rewarding him or her immediately after each session.
- Be very patient when teaching your cat to accept toothbrushing.
- If your cat won't tolerate toothbrushing, your veterinarian can recommend plaque-preventive products for your cat.

## Periodontal Disease—Why Brush?

Periodontal (gum) disease can lead to tooth loss and affects most cats by the time they are 3 years old. Depending on your cat's overall health, bacteria from periodontal disease can spread to affect other organs. One of the best ways to help prevent periodontal disease is to brush your cat's teeth daily, or at least multiple times a week.

Cats are never too young to start having their teeth brushed at home; in fact, the younger they are, the better.

Have your cat's teeth checked by your veterinarian before you start brushing them. Your veterinarian may recommend a dental cleaning to remove any existing plaque and tartar, which contribute to periodontal disease. If your cat has severe dental disease, extraction of the affected teeth may be recommended. Follow your veterinarian's recommendation on how long to wait after dental cleaning or extraction before brushing your cat's teeth.

## What You Need

- Baby toothbrush or pet toothbrush that is an appropriate size for your cat; if your cat won't tolerate a toothbrush, a small piece of washcloth can be used
- Pet toothpaste
- Treat or other reward your cat really likes

Note: Do not use toothpaste for people or baking soda to brush your cat's teeth. Human toothpaste is made with ingredients that can cause stomach upset if swallowed (e.g., detergents, fluoride). Cat toothpaste comes in different flavors (e.g., poultry, beef, fish). You may need to try a couple flavors to



# Brushing Your Cat's Teeth *continued*



find the one your cat likes the best. The more your cat likes the toothpaste, the easier it will be to train him or her to accept brushing.

## Technique

- Toothbrushing should be a bonding experience that is constantly reinforced with praise and rewards. Be very patient—teaching your cat to accept toothbrushing may take weeks. Make toothbrushing enjoyable for your cat by rewarding him or her immediately after each session.
- You only need to brush the outside of your cat's teeth—the side facing the cheek. Only do as much at a time as your cat allows. You may not be able to do the whole mouth at first.
- If you are ever worried about being bitten or scratched, stop. Ask your veterinarian about how best to care for your cat's teeth.
- Start by letting your cat get used to the toothbrush and toothpaste. Put them out and let your cat sniff them. You can let your cat taste the toothpaste to see if he or she likes it.
- Also, get your cat used to you

touching his or her mouth. Lift his or her lips, and slowly and gently rub your cat's teeth and gums with your finger. You might want to dip your finger in something your cat finds tasty, like juice from a can of tuna.

- When your cat is comfortable with you touching his or her mouth and is familiar with the toothbrush and toothpaste, gradually switch to putting the toothpaste on your finger, and then to putting the toothpaste on the toothbrush. Let your cat lick the paste off the brush, at first, to get used to having the brush in his or her mouth. If your cat won't tolerate a toothbrush, a small piece of washcloth can be used. Place a small amount of toothpaste on the washcloth, and rub it over the outside surfaces of your cat's teeth.
- Brush your cat's teeth along the gum line. Work quickly—you don't need to scrub. Work up to 30 seconds of brushing for each side of the mouth, at least, every other day.
- If you notice any problems as you brush, like red or bleeding gums or bad breath, call your veterinarian. The earlier problems are found, the easier they may be to treat.

## Other Ways to Control Plaque

Although there's no substitute for regular toothbrushing, some cats just won't allow it. If you can't brush your cat's teeth, ask your veterinarian about plaque-preventive products. Feeding dry food may also help keep your cat's teeth and gums in good condition. The Seal of Acceptance from the Veterinary Oral Health Council appears on products that meet defined standards for plaque and tartar control in dogs and cats. You can find a list of these products at [www.vohc.org](http://www.vohc.org). ■

## Signs of Dental Problems

- Bad breath
- Sensitivity around the mouth
- Loss of appetite and/or weight
- Yellow or brown deposits on the teeth
- Bleeding, inflamed, and withdrawn gums
- Loose or missing teeth
- Pawing at the mouth or face
- Difficulty chewing
- Hissing and running away from the food bowl



# Brushing Your Dog's Teeth

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# Brushing Your Dog's Teeth *continued*

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- Difficulty chewing



# Children and Hygiene: Tips for Reducing Zoonotic Disease Risk

- Keeping your own pets healthy and parasite-free is a great way to reduce the risk of zoonotic disease. This includes scheduling regular veterinary visits, staying current on vaccines, and using effective parasite control.
- Frequent and thorough handwashing is critically important in preventing transmission of many zoonotic organisms.
- Petting zoos and other interactive animal habitats are valuable educational tools, but children (especially infants and children younger than 5 years) must be properly supervised to help reduce their risk for exposure to zoonotic diseases.

## What Are Zoonotic Diseases?

Zoonotic diseases are illnesses caused by organisms such as viruses and bacteria (also called *pathogens*) that can be transmitted between animals and humans. Direct contact with a sick animal is not always necessary for a zoonotic pathogen to be transmitted. For example, humans can be exposed to roundworms through contact with feces-contaminated soil, even if the infected animal is nowhere around. Some zoonotic diseases, like rabies and salmonellosis, are relatively well known, whereas others, like leptospirosis, are less familiar. Although rabies is a very frightening disease because it causes fatal illness in humans and animals, there are many other zoonotic diseases that can make a person sick but not necessarily cause death.

## Why Are Children at Risk for Exposure to Zoonotic Diseases?

Anyone can contract a zoonotic infection, even a healthy adult, but children are understood to be at greater risk for several reasons. Compared with adults, children tend to have more direct contact with areas that can be contaminated by animal waste, such as the ground, grass, sandboxes, and

standing water. Children are also less likely to wash their hands before eating, and they are more likely to put their hands into their mouths (nail biting, thumb sucking, etc.) during the course of regular daily activities.

Additionally, the immune system of a child may not be able to effectively fight off an infection if exposure occurs. The same may be true for adults whose immune systems are compromised by disease (e.g., AIDS), immunosuppressive treatment (e.g., chemotherapy), or other causes (e.g., pregnancy, advanced age).

## What Types of Animals Can Transmit Zoonotic Pathogens?

Any animal is capable of transmitting a zoonotic pathogen. For example, the rabies virus can be transmitted by cats, dogs, goats, sheep, and a variety of other domestic and wild animals. Certain animals, however, tend to be associated with specific zoonotic diseases. Cats, for example, can transmit *Bartonella* bacteria that cause "cat-scratch disease." *Salmonella* bacteria can be transmitted to humans through contact with several animal species, most notably reptiles (like turtles and lizards), birds, and some rodents. Dogs and cats can have



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# Tips for Reducing Zoonotic Disease Risk *continued*

intestinal parasites, like roundworms and hookworms, that can be transmitted to humans and cause illness.

Because it can be difficult to know exactly which animals can put a person at risk, it is best to exercise good hygiene and some other important preventive measures when around any animals—even your own pets.

## How Can Children Be Protected from Zoonotic Diseases?

Petting zoos, classroom pets, and other interactive animal habitats are valuable educational tools for children, but the potential risk for exposure to zoonotic diseases in these environments should not be dismissed. Because children are particularly vulnerable, it may be safest to prevent their contact with certain animals, such as amphibians, reptiles, baby chicks, and ducklings, to help reduce the risk of exposure to pathogens potentially carried by these animals. In fact, the Centers for Disease Control and Prevention (CDC) has recommended this precaution for children under the age of 5 years. However, avoidance is not always possible or practical, so organizations like the CDC, National Association of State Public Health Veterinarians, and American Veterinary Medical Association (AVMA) are trying to educate the public about the best ways to protect children, adults, and pets from exposure to zoonotic diseases.

## Want more information?

The CDC and AVMA offer advice about proper hand-washing procedure and other ways to protect your family from zoonotic diseases:

- **AVMA:** Pets and Zoonotic Diseases (FAQ)
- **CDC:** Infants and Young Children—Animal Safety Tips
- **CDC:** Wash Hands When Leaving Animal Exhibits

The good news is that you don't necessarily have to get rid of your pet lizard or abandon trips to farms or petting zoos to protect your loved ones from zoonotic diseases—although, if your home contains young children or immunocompromised people, you should consult

your veterinarian about the potential risks. Some basic precautions can significantly reduce the risk of anyone becoming ill:

- Apparently healthy animals can still transmit certain zoonotic diseases, but keeping your own pets healthy is a great place to start. This means scheduling regular wellness visits with your veterinarian, keeping vaccines up-to-date, and staying on top of parasite prevention. Preventive medications for fleas, roundworms, and other parasites are highly recommended for your pets. Discuss these points with your veterinarian to make sure your pet is being adequately protected.
- Wash hands thoroughly after handling pets, before eating or drinking, before preparing food, after using the restroom, after removing dirty shoes or clothes, and after leaving an area where animals are kept—even if you don't remember touching anything. Children should be taught when and how to properly wash their hands.
- Handwashing with soap and water is preferable to using alcohol-based sanitizers, especially when your hands are visibly dirty. Alcohol-based sanitizers can be used if your hands are free of visible dirt.
- After washing your hands, don't dry them on your clothing or previously used towels.
- Teach children to avoid direct contact with wild animals. Wild animals should not be approached or touched, and they certainly should not be kept as pets.
- Keep litterboxes clean, and pick up after your dog. Ideally, wear gloves when handling animal urine or feces.
- Don't eat or drink in areas where animals are kept.
- Don't let animals lick your mouth, and don't share your food with them.
- When at a petting zoo or other place where touching animals is encouraged, always remind children to (1) wash their hands afterward (even if they didn't touch anything), (2) not eat or drink anything until they have left the animal area and washed their hands, and (3) avoid putting anything into their mouths. Children younger than 5 years should be closely supervised, and toys and pacifiers should not be permitted into areas where animals are housed. ■



# Puppy Training

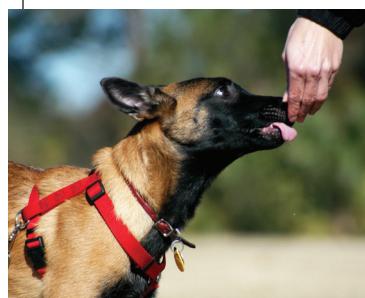
- Puppy training is an important step toward a lifetime of good behavior.
- Learning is adult-like in puppies by 8 weeks of age.
- Puppies respond better to positive reinforcement than punishment.
- Puppies should always be supervised or should be confined when you are away.
- Training should be consistent, involve positive reinforcement, and include everyone in the family.
- It's important for your puppy to be socialized around other people and other pets before he or she is fully vaccinated, but consult your veterinarian about disease risks before exposing your puppy to other dogs or areas where unfamiliar dogs have been.
- Group puppy preschool socialization classes are a good way to socialize your puppy while minimizing disease risks.
- Group puppy kindergarten classes are excellent for teaching puppies basic manners with exposure to other puppies and a training expert on-hand for guidance.

## Why Is Puppy Training Important?

Like children, puppies need to learn the appropriate behavior for living in a household and interacting with others. Puppies also seek positive reinforcement and are willing and able to learn. Learning is adult-like by just 8 weeks of age.

Unfortunately, many puppies grow into dogs that are eventually surrendered to shelters because of behavior problems. In most cases, it's not the dog's fault. It's simply because of a lack of early appropriate training and socialization.

Proper puppy training early on will help you avoid bumps in the road and lead to a better relationship with your dog in the years ahead. Training can not only prevent some undesirable behaviors but also give you appropriate ways to address problematic behaviors. Training can provide for clear communication between you and your dog.



## What Should I Know About Puppy Training?

Several basic rules of puppy training will lead to a more rewarding experience for everyone involved:

- **Reward good behavior.** Puppies respond best to positive reinforcement. Reward good behavior with a special treat, piece of kibble, petting, or praise.
- **Be consistent.** When you are training the puppy, make sure a consistent cue (verbal or hand signal) is used by everyone in the family. If, for example, one family member says "here" and another says "come," the inconsistency may confuse the puppy. Consistency will make it easier for the puppy to understand what you are asking for.
- **Be predictable.** Have predictable interactions with your puppy. Predictable interactions foster trust and teach good manners. Before feeding, or giving a toy, ask your puppy to respond to a known cue, such as "sit."

# Puppy Training

*continued*

Once you receive an appropriate response, give the puppy the food or toy and praise for good behavior.

→ **Avoid punishment.** You should never spank or yell at a puppy, yank on a puppy's collar, or rub a puppy's nose in urine or feces. Punishment not only can weaken a puppy's trust in people, but also can lead to fear, anxiety, and aggression. For example, with house training, punishment just teaches the puppy not to eliminate in the presence of people rather than where it's appropriate to eliminate. If the puppy has an accident, simply clean the soiled area without scolding. Take the puppy outside and reward elimination in the appropriate area. Consult your veterinarian if you are having problems house training your puppy.

→ **Puppies should always be supervised.** Until your puppy is trained, he or she should be supervised at all times or confined safely in a crate, kennel, or exercise pen when you are away. This will reduce accidents in the house and keep your puppy from chewing on or swallowing items that could be dangerous.

→ **Keep training sessions short.** Like children, puppies have short attention spans. Initially, training sessions at home should only last for about 1 to 5 minutes. Sessions may be lengthened as the puppy matures. Exposure at group classes should be careful not to overwhelm the puppy.

→ **Teach your puppy to be comfortable being handled.** Whenever possible, offer food treats when handling your puppy's paws, ears, mouth, and body. Fostering positive associations with being handled will make it easier for you to trim nails, brush teeth, clean ears, and give medications. It will also make for less stressful trips to the groomer and veterinary clinic.

→ **Expose your puppy to other people and pets.**

The earlier your puppy is introduced to other people, the more comfortable he or she will feel around them, and the less likely he or she will be to exhibit shy behavior. Puppies should be allowed to interact at their own pace rather than being forced into an interaction. Treats should be used to create pleasant memories. Exposure to other pets is important, too, but be careful of disease risks at dog parks or from interactions with unknown dogs with a questionable vaccine history. Consult your veterinarian regarding the benefits of early enrollment in a puppy socialization class. Your veterinarian can help you manage disease risks while still allowing for smart socialization experiences with environments and other dogs.

→ **Provide your puppy with appropriate chew toys.**

Puppies explore the world with their mouths and enjoy chewing. Consequently, your puppy may want to chew on furniture, clothing, hands, and other inappropriate items. Simply interrupt the undesirable behavior by getting the puppy's attention in a nonconfrontational way and redirect the puppy to something more appropriate to chew on. Avoid giving your puppy a sock or other article of clothing to chew. These items may be inadvertently swallowed, and may also give the puppy the message that it's okay to chew on clothing. Consult your veterinarian about which chew toys are safest.

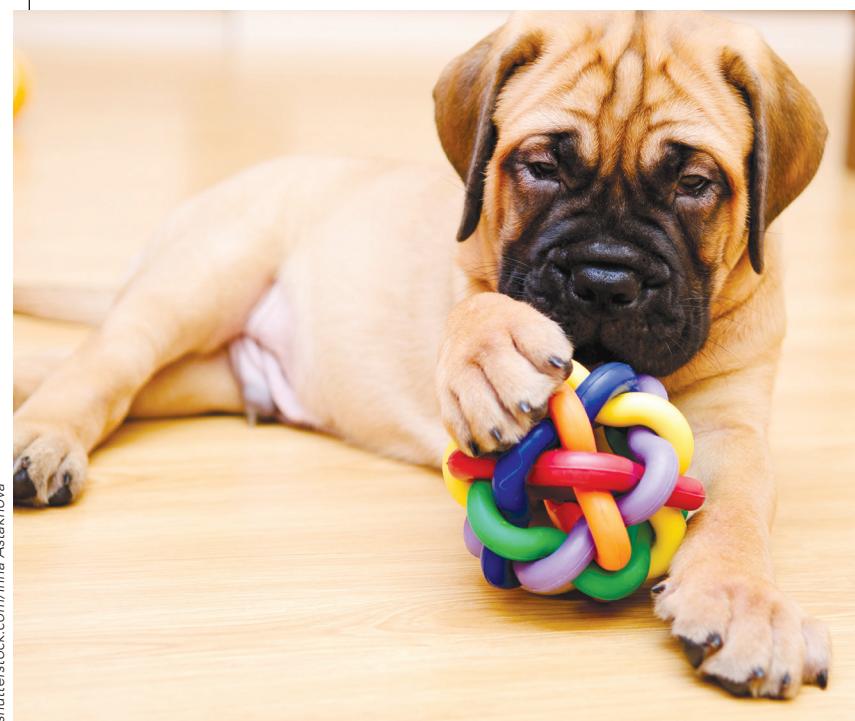
## Why Should I Consider Attending Group Puppy Preschool Socialization Classes or Puppy Kindergarten Training Classes?

Puppy preschool socialization classes are designed for young puppies in their socialization period (under 3 to 4 months



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## Puppy Training *continued*



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of age). The focus is on education regarding normal behavior, providing positive socialization experiences, and teaching problem prevention techniques. Puppy kindergarten training classes are for puppies outside of their socialization period (older than 3 to 4 months of age). Generally, there is a greater focus on teaching basic manners in older puppies and building on previous experiences.

Attending a group puppy class led by a training specialist has several advantages, including:

- Empathy and understanding regarding normal behaviors
- Expert guidance and answers to questions or concerns regarding undesirable behaviors
- Introduction to positive reinforcement training
- Knowledge of how to implement problem-solving techniques
- Prevention of behavioral problems related to fear, anxiety, and aggression

- A controlled and safe environment for puppy play, socialization, and exploration during sensitive periods of development

Group puppy classes are offered by many veterinary clinics, dog training facilities, and pet supply stores. It's important to find a course that emphasizes pet parent education and positive, controlled socialization experiences. Classes should highlight positive reinforcement training rather than punishment.

Ask your veterinarian for recommendations regarding group socialization classes and puppy training classes. Several positive puppy training resources are available. Among other things, good puppy classes should cover:

- Proper socialization and environmental exposure
- Play biting and mouthing
- Destructive chewing
- Prevention of food and resource guarding
- Crate training and exercises fostering independence
- Handling and restraint exercises
- Housetraining tips and techniques
- Basic training for good manners and loose leash walking

Reputable facilities will require proof of vaccination and good physical health for all puppies attending the course. This minimizes disease risk, especially while young puppies' (younger than 4 months) immune systems are still developing. Some vaccinations need to be given at least 7 to 10 days before the class begins to protect your puppy. Consult your veterinarian about when your puppy will be ready to attend classes. ■



# Why Do I Need to Vaccinate My Pet?

- Vaccination is an important weapon against infectious diseases.
- Some diseases, like rabies, are transmissible to humans, so protecting your pets also protects your family members and community.
- Pets that stay indoors also can be exposed to infectious diseases, so even indoor cats can benefit from vaccinations.
- Vaccines are safe and generally well tolerated by most pets.
- Vaccine selection and scheduling should be an individualized choice that you and your veterinarian make together.

Companion animals today have the opportunity to live longer, healthier lives than ever before, in part due to the availability of vaccines that can protect pets from deadly infectious diseases. Over the past several decades, the widespread use of vaccines against diseases like rabies has saved the lives of millions of pets and driven some diseases into relative obscurity. Unfortunately, infectious diseases still pose a significant threat to dogs and cats that are unvaccinated; therefore, although vaccine programs have been highly successful, pet owners and veterinarians cannot afford to be complacent about the importance of keeping pets up-to-date on their vaccinations.

## How Do Vaccines Work?

Although there are many types of vaccines, they tend to work through a similar principle. Most vaccines contain a very small portion of the virus or bacterium that is the infectious agent. Some vaccines contain small quantities of the entire virus or bacterium, whereas others contain particles that are part of the infectious organism. When this material is introduced into the body in a vaccine, the body's immune system responds through a series

of steps that include making antibodies and modifying other cells that will recognize the target organism later. When the vaccinated individual encounters the "real" organism later, the body recognizes the organism and reacts to protect the vaccinated individual from becoming sick by activating the immune system.

## Why Does My Pet Need Vaccines?

### *Vaccines protect your pet.*

Vaccines are one of our most important weapons against infectious diseases. Some diseases, such as "kennel cough" in dogs and rhinotracheitis in cats, can be transmitted directly from pet to pet. If your pet is ever around other animals, such as at a kennel, dog park, grooming salon, or daycare facility, exposure to infectious disease is possible. Even pets that look healthy on the outside may be sick, so keeping your pet's vaccines up-to-date is a good way to help prevent illness.

### *Even primarily indoor pets can be exposed to diseases.*

Even if your pet doesn't have direct contact with other animals, some diseases can be transmitted indirectly. For example,

# Why Do I Need to Vaccinate My Pet? *continued*

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parvovirus infection, which is potentially fatal, is spread through contact with feces from an infected dog. Even if your dog never has contact with a dog infected with parvovirus, exposure to the virus can occur through contact with feces from an infected dog, such as in a park or on a beach. Lyme disease—a dangerous infection that is carried by ticks—is another disease that your dog can be exposed to without coming into contact with other dogs.

In cats, panleukopenia infection is potentially fatal and spread through contact with body fluids (mostly urine and feces) from an infected cat. Once a cat is infected with panleukopenia, it may shed virus in body fluids for a few days or up to 6 weeks. Panleukopenia can live in the environment (such as on contaminated bedding, food bowls, litter boxes, and other items) for a very long time, so contact with contaminated objects can spread the infection to other cats. Additionally, if a pet owner is handling an infected cat, failure to change clothes and wash hands thoroughly with the correct disinfectant can expose other cats to the disease.

So, even pets that spend most of their lives indoors or have very limited contact with other animals are not completely safe from exposure to infectious diseases.

## ***Vaccines protect your family and community.***

Some infectious diseases, such as leptospirosis in dogs and rabies in dogs and cats, are zoonotic diseases. That means humans also can become infected. In the case of rabies and leptospirosis, both diseases can cause serious illness and death in infected individuals—including humans. Protecting your pets against these diseases also protects the rest of your family members, as well as other pets and people in your community.

## **Are Vaccines Safe?**

All of the available vaccines for dogs and cats have been thoroughly tested and found to be safe when administered as directed. Most pets tolerate vaccines very well, although reactions can occur in some cases. Some pets can seem a little "tired" after receiving vaccines. Notify your veterinarian if your pet develops breathing problems, facial swelling, vomiting, hives, redness on the skin, or other unusual changes after receiving a vaccine. You also should tell your veterinarian if your pet has ever had a problem in the past after receiving a vaccine.

## **Which Vaccines Does My Pet Need?**

Many vaccines are available for dogs and cats, but every pet does not need to receive every available vaccine. So how do you know which vaccines your pet should have? The American Animal Hospital Association (AAHA) and the American Association of Feline Practitioners (AAFP) have summarized vaccine recommendations to help veterinarians clarify how to best protect dogs and cats through the use of vaccine programs.

# Why Do I Need to Vaccinate My Pet? *continued*

AAHA and AAFP evaluated the available vaccines and categorized them to provide guidelines on how commonly they should be used. Vaccines are categorized as core, non-core, or not recommended. A core vaccine is one that all pets should receive. The core vaccines for dogs are rabies, distemper, adenovirus-2, and parvovirus; and the core vaccines for cats are rabies, rhinotracheitis (feline herpesvirus-1), panleukopenia (feline distemper), and calicivirus. Non-core vaccines are optional ones that pets can benefit from based on their risk for exposure to the disease. Examples include the vaccines against Lyme disease and leptospirosis in dogs, and the vaccines against feline leukemia virus and feline immunodeficiency virus (or feline AIDS) in cats. Categorization of a vaccine as "not recommended" does not mean that the vaccine is bad or dangerous. This designation simply means that widespread use of the vaccine is not currently recommended.

Because core vaccines are recommended for all pets, your veterinarian will recommend keeping these vaccines up-to-date at all times. The decision regarding non-core vaccines should be made after you and your veterinarian have discussed the vaccines in question and whether your pet might benefit from receiving them. Factors to consider include your pet's lifestyle (how much time your pet spends outside), where you live, where you travel with your pet, and how often your pet has contact with other animals. Bear in mind that vaccine recommendations and your pet's lifestyle can change. Your veterinarian may want to discuss modifying the vaccine recommendations to ensure that your pet is well protected.

## What Is the Recommended Schedule for Vaccines?

Puppies and kittens generally receive their first vaccines when they are around 6 to 8 weeks of age (depending on the vaccine and manufacturer's recommendations). Booster vaccines are generally given during your puppy or kitten checkup visits; your veterinarian can discuss the recommended schedule with you. Vaccines are generally repeated a year later.

Although puppies and kittens are considered especially vulnerable to some diseases, it is also very important for adult pets to be up-to-date on vaccines. Traditionally, many vaccines were repeated yearly, during regular checkup examinations. However, research has shown that some vaccines can protect pets for longer than 1 year. In light of these findings, the AAHA and AAFP guidelines note that some vaccines don't need to be repeated more frequently than every 3 years. The decision regarding how often your pet needs vaccine boosters depends on several factors, including your pet's overall health status and risk for exposure to the diseases in question. Your veterinarian may recommend annual boosters after considering your pet's lifestyle and disease exposure risk. The decision regarding how often to administer any vaccine (annually, every 3 years, or not at all) should be an individualized choice that you and your veterinarian make together.

Vaccination remains one of the most important services your veterinarian offers, and although vaccination is a routine procedure, it should not be taken for granted. It also allows a regular opportunity for your veterinarian to perform a physical examination, which is very important for keeping your pet healthy. Protecting patients is your veterinarian's primary goal, and developing an appropriate vaccine protocol for your pet is as important as any other area of medicine. ■



# Stretches and PROM of the Pelvic Limb

Maria Maddox, LVT, CCRP, AMCP

Stretches are held for 15 to 30 seconds, and repeated for a total of 1 to 3 repetitions, performed 1 to 3 times a day. They should not cause any obvious discomfort for the pet; discontinue and talk to the veterinarian if the patient is noncompliant.

For more information on physical rehabilitation exercises for cats and dogs, please visit [todaysveterinarytechnician.com](http://todaysveterinarytechnician.com).

## Sartorius Stretch

Flex the knee to about 90°, then gently extend the hip.



## Adductor Stretch

Keep patient's hip at neutral, then place hand on the medial aspect of stifle and hock and gently lift the hip into abduction.



## Iliopsoas Stretch

Place your hand proximal to the stifle and push the hip into extension. Support the distal aspect of the patient's limb off of the floor.



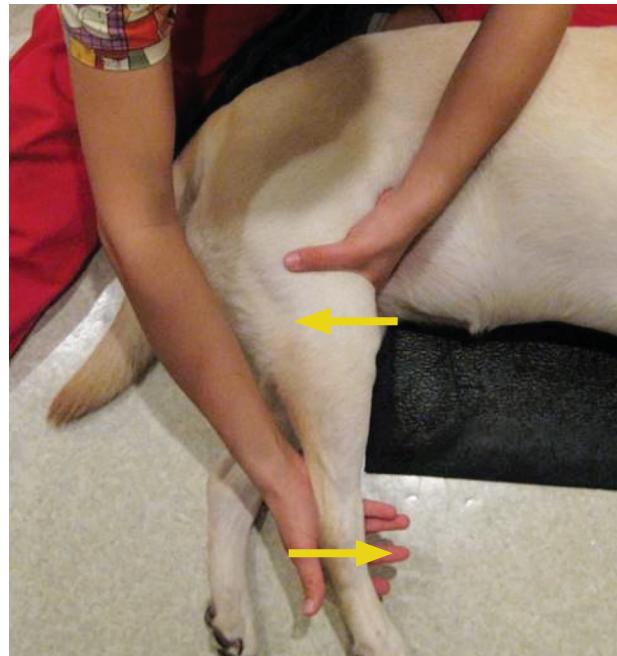
These exercises should only be performed as prescribed by the patient's veterinarian. These visual instructions are merely for guidance and are no substitute for proper training in stretching and PROM techniques.

# Stretches and PROM of the Pelvic Limb *continued*

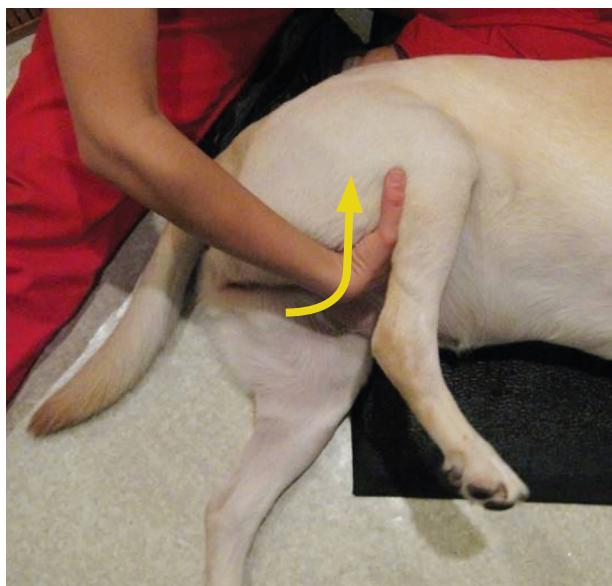
## PROM

For most postoperative orthopedic patients, PROM (passive range of motion) exercises should be performed 3 to 4 times a day. The affected joint can be moved for 5 to 10 repetitions, moving through both flexion and extension. Hold the joint at the end range for a total of 1 to 3 seconds.

### Stifle Flexion and Extension



### Hip Flexion and Extension





# Toxin Triage Sheet

## Animal-related emergency? Call 888-426-4435

For non-emergency information about our services, call Customer Service at 888-426-4911 Monday–Friday, 9AM to 5PM, CST

We do our best to answer your calls quickly, and having all necessary information at hand can expedite handling your call. Here's what we'll need:

### **1. Information on the exposure**

The best way to get this is for the pet owner to bring in original packaging/label information. Many products such as rodenticides, lawn care products, cleaning supplies, etc. have an EPA REG registration number (these are all numbers with dashes) tied to ingredient information. The ASPCA Animal Poison Control Center has an extensive database of these numbers which can help accurately identify the product in question. If the product is a pill, most pills have codes on them that can also help.

### **2. Patient's medical record (signalment)**

We always ask about breed, sex, reproductive status (altered, pregnant, lactating) along with age and weight of the patient. Pre-existing medical conditions about the patient are also important and will potentially dictate treatment recommendations.

### **3. Detailed history of the exposure**

Information such as when and where the exposure happened and the worst-case scenario (how many pills are missing or how much fertilizer might be missing, for example) will all dictate assessment and treatment recommendations. Information will also be needed on the time frame when exposure occurred (time owner left and returned, for example) and if any packing was ingested.

### **4. Signs and when they started**

What signs is the patient showing and when did they begin? Have any treatments already been done? Depending on the patient's current status, particular treatment recommendations (like inducing vomiting) may not be recommended.

This form is reproduced with the permission of the American Society for the Prevention of Cruelty to Animals (ASPCA).



TECHNICIAN  
RESOURCE

# Toxin Triage Sheet

**ASPCA** ANIMAL POISON  
CONTROL CENTER  
888.426.4435

## Owner Information

Owner name: \_\_\_\_\_

Address: \_\_\_\_\_  
\_\_\_\_\_

Phone number: \_\_\_\_\_

## Payment Information

(check applicable and fill in relevant blanks)

- Clinic credit card on file
- Clinic credit card not on file (have info at hand)
- Owner's credit card

Credit card number:

---

Expiration date:

---

Security code on back

---

## Patient Information (check applicable and fill in relevant blanks)

Name: \_\_\_\_\_

Breed: \_\_\_\_\_ Sex: \_\_\_\_\_

Spayed     Neutered     Intact     Immature     Pregnant     Lactating

Age \_\_\_\_\_ Weight \_\_\_\_\_

## Significant Health History

Current medication list:

---

---

Vaccination history up to date     Vaccination history not up to date

## Exposure Information

Product (trade name/generic name): \_\_\_\_\_

Milligram strength/concentration: \_\_\_\_\_

Number of pills involved/worst-case scenario range: \_\_\_\_\_

Time frame range: \_\_\_\_\_ EPA regulation number (if applicable): \_\_\_\_\_

Ingredients (if known): \_\_\_\_\_

---

Story of the exposure: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**ASPCApr.org**  
**ASPCApr.org/poison**

## Any Treatments Already Completed

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Quick Reference:

# Common Analgesic Drugs\*

## Common Analgesic Drugs

DRUG	DOSE	ROUTE
<b>Full Mu Opioids</b>		
<b>Hydromorphone</b>	0.05–0.1 mg/kg	SC, IM, IV
<b>Morphine</b>	0.3–1.0 mg/kg	SC, IM, IV
<b>Methadone</b>	0.2–0.5 mg/kg	SC, IM, IV
<b>Oxymorphone</b>	0.02–0.06 mg/kg	SC, IM, IV
<b>Partial Agonists</b>		
<b>Buprenorphine</b>	10–20 mcg/kg	IM, IV
<b>Simbadol (cats only)</b>	0.24 mg/kg	SC
<b>Mixed Agonist</b>		
<b>Butorphanol</b>	0.2–0.4 mg/kg	SC, IM, IV
<b>Alpha<sub>2</sub>-Agonists</b>		
<b>Dexmedetomidine</b>	2.5–10 mcg/kg	IM, IV
<b>Dexmedetomidine (postanesthetic recovery dose)</b>	0.05–2 mcg/kg	IV
<b>Alpha<sub>2</sub>-Antagonists</b>		
<b>Atipamezole</b>	10× dexmedetomidine dose; same <b>volume</b> as dexmedetomidine	IM
<b>NMDA Antagonists</b>		
<b>Ketamine (sedation)</b>	5–10 mg/kg	SC, IM
<b>Ketamine + midazolam (induction)</b>	Ketamine: 5 mg/kg Midazolam: 0.3 mg/kg	IV
<b>Ketamine + diazepam (induction)</b>	Ketamine: 5 mg/kg Diazepam: 0.5 mg/kg	IV
<b>Amantadine (treatment of pain)</b>	3–5 mg/kg once daily	PO
<b>Adjunct Drugs</b>		
<b>Gabapentin</b>	Generally start at 5–10 mg/kg twice daily; increase or decrease based on the individual patient	PO
<b>Tramadol</b>	Dogs: 3–5 mg/kg 3 times daily Cats: 2–4 mg/kg twice daily	PO

# Quick Reference: Common Analgesic Drugs *continued*

## Common Constant-Rate Infusions

DRUG	LOADING DOSE	CRI
<b>Ketamine</b>	0.5–1 mg/kg	10–20 mcg/kg/min
<b>Fentanyl</b>	Cats: 5 mcg/kg Dogs: 5–10 mcg/kg	Cats: 0.2–0.4 mcg/kg/min (anesthetic dose) Dogs: 0.5–0.7 mcg/kg/min (anesthetic dose); 0.05–0.3 mcg/kg/min (analgesic dose)
<b>Remifentanil</b>	None	Cats: 0.2–0.4 mcg/kg/min (anesthetic dose) Dogs: 0.5–0.7 mcg/kg/min (anesthetic dose); 0.05–0.3 mcg/kg/min (analgesic dose)
<b>Lidocaine (dogs only)</b>	1 mg/kg	50–100 mcg/kg/min
<b>Hydromorphone</b>	0.05 mg/kg	0.05–0.1 mg/kg/h (anesthetic dose) 0.01–0.02 mg/kg/h (postoperative analgesic dose)
<b>Morphine</b>	0.5 mg/kg	0.1–0.2 mg/kg/h

## Common Injectable NSAIDs for Postoperative Analgesia

- Carprofen (dogs only): 2 to 4 mg/kg SC, IV; note that this usage is off-label in the United States
- Meloxicam: 0.2 mg/kg SC
- Robenacoxib: 2 mg/kg SC

## Local Anesthetic Blockades

- Lidocaine: 1–4 mg/kg
- Bupivacaine: 0.5–2 mg/kg

## Epidural Analgesia and Anesthesia

- Lidocaine: 1–2 mg/kg
- Bupivacaine: 0.5–1 mg/kg
- Morphine: 0.1 mg/kg
- Buprenorphine: 12.5 mcg/kg
- Drugs should be added to preservative-free saline for proper delivery. To calculate total volume of drug and saline needed for epidural administration, use the following:

$$\text{Weight} \times 0.3 \text{ mL} = \text{total volume}$$

\*Drug protocols should be tailored to each individual patient. Debilitated, pediatric, and geriatric patients may require smaller doses than animals that are considered healthy. All drug doses are commonly used at and printed with permission from the UC Davis Veterinary Medical Teaching Hospital.

# Pet Cardiopulmonary Resuscitation (CPR)

- If your pet has a cardiac arrest, you can help save his or her life by performing cardiopulmonary resuscitation (CPR).
- By distributing much-needed oxygen and blood throughout a pet's body, CPR can help do the work that the lungs and heart have stopped doing.
- If you think that your pet's breathing or heartbeat has stopped, if possible, have someone call your veterinarian while you perform CPR.

Cardiac arrest means that the heart is not beating and breathing has stopped, resulting in a lack of oxygen and blood throughout the body. If your pet has a cardiac arrest, you may be able to help save his or her life by performing cardiopulmonary resuscitation (CPR) until help arrives or you can get your pet to your veterinarian. By distributing essential oxygen and blood throughout a pet's body, CPR can help do the work that the lungs and heart have stopped doing.

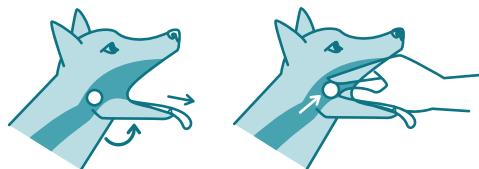
If you think that your pet's breathing or heartbeat has stopped, it is important to stay calm but act immediately. If someone is with you, have him or her call your veterinarian while you do the following:

## Step 1: Check for Responsiveness

First, check your pet's breathing by placing your hand in front of his or her nose and mouth, but do not cover them and block the airway. If your pet is not breathing, move to step 2 without spending time checking for a heartbeat.

## Step 2: Clear the Airway

If you don't see or feel your pet breathing, immediately ensure that the airway is clear. Pull the tongue forward



out of the mouth, but be careful: even an unresponsive animal can bite. Look into the throat for a foreign object or obstruction. If you find one, remove it carefully. With your pet lying on its side, move your pet's chin away from the chest until the neck is straight, but don't move the neck if you suspect it is injured. This step should only take seconds.

## Step 3: Chest Compressions

To improve chances of survival, start chest compressions as quickly as possible after steps 1 and 2 are performed.

To perform compressions in most dogs:

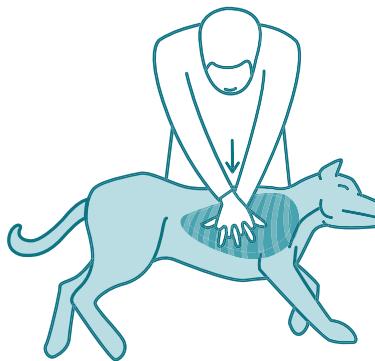
- Place your hands on top of one another, with the palm of one on the back of the other.
  - If your pet has a narrow chest, put your stacked hands over your pet's heart. The heart is located in the lower half of the chest, behind the elbow of a front leg in natural position.
  - If your pet has a round chest, put your stacked hands on the widest part of the chest.

# Pet Cardiopulmonary Resuscitation (CPR) *continued*

- Lock your elbows so that your arms are straight, and get your shoulders directly over your pet so you can push straight down.
- Using your core body muscles (ie, leaning from the waist), press down on the chest to compress it by one-third to one-half of its width. Press harder for larger dogs and with less force for smaller dogs.

For cats and tiny pets, compress the chest with the thumb and forefingers of one hand.

Perform compressions at a rate of 100 compressions per minute (to the beat of "Stayin' Alive"). Be sure to let up on pressure after each compression.

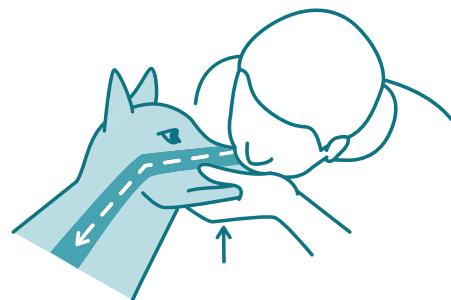


## Step 4: Artificial Respiration

After 30 chest compressions, give your pet 2 brisk breaths. Straighten your pet's head and neck, close the mouth, and breathe directly into the nose, but not the mouth, until the chest expands. Avoid lifting the head up off of the ground while you give the breaths, as it bends the airway.

If the chest doesn't expand, check again for a foreign object in the throat and straighten the airway. Ensure that no air escapes between your mouth and your pet's nose.

Resume compressions after the 2 breaths are given, without delay. Continue rotating between 30 chest compressions and 2 breaths until a response is seen. ■

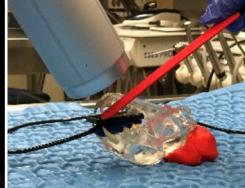
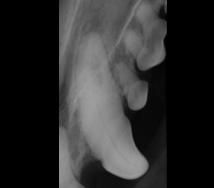
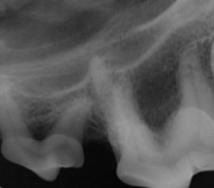




# Radiography Chart

VIEW	PATIENT RECUMBENCY	FILM/SENSOR PLACEMENT	TECHNIQUE	TIPS
<b>Rostral Mandibular</b> <i>Incisors/canines</i>	Dorsal	Parallel to mandible Edge of film to crowns length going caudally	Bisecting angle	Beam angle 15-25°
<b>Cranial Right/Left mandibular</b> <i>P1-p3</i>	Dorsal	Parallel to mandible Edge of film to crowns	Bisecting angle	Beam angle 30-45°
<b>Caudal</b> <b>Right/Left mandibular</b> <i>P3-m1</i>	Lateral-affect side up	Parallel to tooth On lingual surface of mandible	Parallel	Beam angle 90° to film
<b>Rostral maxillary</b> <i>Incisors/canines</i>	Sternal	Parallel to hard palate Edge of film to crowns length going caudally	Bisecting angle	Beam angle 45°
<b>Individual</b> <b>Canine tooth oblique</b>	Sternal-maxillary Dorsal-mandibular	Parallel to mandible or maxilla	Bisecting angle	Beam angle 30-45°
<b>Cranial Right/left Maxillary</b> <i>P1-p3</i>	Sternal	Parallel to hard palate	Bisecting angle	Beam angle 30-45°
<b>Caudal Right/Left Maxillary</b> <i>P3-m3</i>	Sternal	Parallel to hard palate	Bisecting angle	Beam angle 45° towards the lateral canthus

# Radiography Chart *continued*

VIEW	CANINE POSITIONING	RADIOGRAPH	FELINE POSITIONING	RADIOGRAPH
<b>Rostral Mandibular</b> <i>Incisors/canines</i>				
<b>Cranial Right/Left mandibular</b> <i>P1-p3</i>	A dental model is held by a robotic arm, with a red object placed under it. The model is positioned to show the premolars.		A dental model is held by a robotic arm, with a red object placed under it. The model is positioned to show the premolars.	
<b>Caudal</b> <b>Right/Left mandibular</b> <i>P3-m1</i>	A dental model is held by a robotic arm, with a red object placed under it. The model is positioned to show the molars.		A dental model is held by a robotic arm, with a red object placed under it. The model is positioned to show the molars.	
<b>Rostral maxillary</b> <i>Incisors/canines</i>	A dental model is held by a robotic arm, with a red object placed under it. The model is positioned to show the upper incisors and canines.		A dental model is held by a robotic arm, with a red object placed under it. The model is positioned to show the upper incisors and canines.	
<b>Individual</b> <b>Canine tooth oblique</b>	A dental model is held by a robotic arm, with a red object placed under it. The model is positioned to show a single canine tooth from an oblique angle.		A dental model is held by a robotic arm, with a red object placed under it. The model is positioned to show a single canine tooth from an oblique angle.	
<b>Cranial Right/left</b> <b>Maxillary</b> <i>P1-p3</i>	A dental model is held by a robotic arm, with a red object placed under it. The model is positioned to show the upper premolars and molars.		A dental model is held by a robotic arm, with a red object placed under it. The model is positioned to show the upper premolars and molars.	
<b>Caudal Right/Left</b> <b>Maxillary</b> <i>P3-m3</i>	A dental model is held by a robotic arm, with a red object placed under it. The model is positioned to show the upper molars and third molars.		A dental model is held by a robotic arm, with a red object placed under it. The model is positioned to show the upper molars and third molars.	



# Feline Mobility Questionnaire for Owners<sup>1</sup>

	ALL OF THE TIME	SOME OF THE TIME	NONE OF THE TIME
Does your cat sleep more, and/or is it less active?			
Does your cat go out less?			
Is your cat less willing to jump up or down?			
Does your cat only jump up or down from lower heights?			
Does your cat show signs of being stiff when he or she walks or runs?			
Is your cat more reluctant to come and greet you or interact with you?			
Does your cat play with other animals or toys less?			
Does your cat hunt less?			
Does your cat have a poor coat?			
Is your cat less agile?			
Does your cat show signs of lameness or limping?			
Does your cat have toileting accidents outside the litterbox?			
Does your cat have difficulty getting in or out of the cat flap?			
Does your cat have difficulty going up or down stairs?			
Does your cat groom less?			
Does your cat groom more?			
Does your cat like being groomed by you?			
Does your cat like being picked up?			
Does your cat like being stroked?			
Does your cat like strangers?			
Does your cat seem restless at home?			
Does your cat vocalize a lot?			
Does your cat seem frightened by sudden noises?			
Is your cat scratching (post/furniture) more?			
Is your cat scratching (post/furniture) less?			
Has your cat changed his/her toileting behavior?			
Is your cat spraying in the house?			
Has your cat become more aggressive toward you?			
Has your cat become more aggressive toward other cats?			
Has your cat become aggressive toward visitors?			

<sup>1</sup>. Bennett D. Feline osteoarthritis 1: what is it and how can the veterinary nurse help in its recognition? *Feline Focus* 2015;1(10):349-357.



# Ear Cleaners for Use in Patients With Chronic Otitis



**Sandra Koch, DVM, MS, DACVD**  
College of Veterinary Medicine, University of Minnesota

Ear cleaners should be used at home as part of most treatment protocols for chronic otitis. Initially, they can be used once daily to twice weekly, depending on the severity of the otitis and amount of discharge present; after otitis and infection are resolved, they are usually used once to twice weekly as maintenance therapy to help prevent future infections.<sup>1-4</sup>

The table lists types of ear cleaners; their indications, formulations, and considerations for use; and some commercially available examples.

Type of Ear Cleaner	Indications	Formulations (Examples)	Concerns	Veterinary Products (Examples)
Drying agents	<ul style="list-style-type: none"> <li>Used for cleansing and drying</li> <li>Used for prophylaxis and treatment and as a deodorizer</li> </ul>	May contain isopropyl alcohol, acetic acid, boric acid, benzoic acid, malic acid, salicylic acid, silicone dioxide, and sulfur	May be irritating, may cause a burning sensation in ulcerated ears, and should be avoided in severely inflamed/ ulcerated ears (eg, those infected with gram-negative bacteria, such as <i>Pseudomonas</i> species)	<ul style="list-style-type: none"> <li>CleaRxTreatment Dryer</li> <li>MalAcetic Otic</li> <li>Otic Clear</li> <li>Otic-Clenz</li> <li>OtiRinse Ear Solution</li> <li>Oti-Soothe Ear Cleansing Solution</li> <li>UltraOtic Rinse</li> </ul>
Antiseptics	<ul style="list-style-type: none"> <li>Used as antimicrobial for yeast and/or bacteria</li> <li>May be used alone or combined with other therapies</li> <li>TrizEDTA is effective against <i>Pseudomonas</i> species</li> </ul>	May contain TrizEDTA (chelating agent), chlorhexidine, iodophors, boric acid, acetic acid	High concentrations of chlorhexidine and iodophors are usually contraindicated with ruptured tympanums	<ul style="list-style-type: none"> <li>TrizEDTA Aqueous and Crystals Flush</li> <li>TrizEDTA+Keto</li> <li>MalAcetic Otic</li> <li>Otocetec Solution</li> <li>Otic Clear</li> </ul>
Ceruminolysis	<ul style="list-style-type: none"> <li>Ceruminolysis</li> <li>Ceruminous otitis externa</li> <li>May be combined with a drying ear cleaner after a ceruminolytic product to help remove debris and prevent maceration</li> </ul>	May contain squalene (most effective), dioctyl sodium sulfosuccinate, urea, carbamide peroxide, glycerin, lanolin, propylene glycol, phytosphingosine	May predispose to yeast overgrowth	<ul style="list-style-type: none"> <li>Cerumene</li> <li>Epiklean Ear Cleanser</li> <li>KlearOtic</li> <li>Douxo Micellar</li> </ul>
Combination products	<ul style="list-style-type: none"> <li>Drying and disinfectant agents</li> <li>Effective for mildly waxy and inflamed ears</li> <li>Prophylaxis in cases of recurrent otitis externa</li> </ul>	May contain propylene glycol, lanolin, glycerin, lactic acid, parachlorometaxylenol	May be irritating if contains alcohol	<ul style="list-style-type: none"> <li>Epi-Otic Advanced</li> <li>Douxo Micellar</li> </ul>

## **Ear Cleaners for Use in Patients With Chronic Otitis** *continued*

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Removal of debris and purulent material greatly improves the efficacy of topical antimicrobials, especially aminoglycosides and polymyxin B. However, overcleaning should be avoided because it can contribute to maceration and ear disease. Clients should be educated on the proper technique to clean the ears and to avoid using cotton balls and cotton swabs inside the ears.

*For more information on diagnosis and treatment of chronic otitis, see the May/June 2017 article [Dermatology Details: The Challenge of Chronic Otitis in Dogs—From Diagnosis to Treatment](#).*

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