



Welcome  
to  
**Fullwood**  
Animal Hospital

**We are so excited that you have chosen our hospital for your pet's needs!**

Here is some basic information about our hospital.

**Care to Share Program** - Refer a new client and receive a \$25 credit on your account.

**We offer boarding for our canine, feline and exotic friends** - Your canine friend will be pampered at our hospital with daily walks in our fenced in play yard. If you want to give them something extra special, consider signing up for extra playtime or treat times. Your feline friend will be provided a hiding spot and toys for enrichment during their stay. We encourage you to bring your pets own food to reduce the risk of dietary upset.

**Canine and Feline boarding requirements:**

A current physical exam performed by a Fullwood doctor, Rabies vaccine, canine and feline Distemper vaccine, Bordetella vaccine (canines only), intestinal worm check and being free from external parasites (fleas and ticks) are required for boarding, hospitalization and grooming. Any friends with fleas or ticks present will be administered a preventative at the owner's expense.

**Pets taking medications while boarding** – We will administer 1-2 medications at \$3/day or 3+ medications at \$6/day to our furry friends. Injectable medications or more than 3 medications will be charged \$5.00 per day.

Canine Pricing \$45.00 per night

Feline Pricing \$35.00 per night

Exotic Boarding \$35.00 per night

**Drop off/Pick up times**

Monday-Friday 8:30am-11:00am, 2:30pm-5pm

Saturday/Sunday 7:30am-9:00am, 4:30pm-6:00pm

**There are no after hour pickups or drop offs**

**Billing** - We do not offer payment plans but we do accept Care Credit and Scratch Pay. Care Credit is a medical credit card that offers a 6 month, no interest payment option for charges over \$200. Please be aware, if the balance is not paid in full within the 6 months, you will be charged interest on the entire balance at a high rate. Scratch Pay is a short term loan that is repaid over an agreed upon time frame.

**Laser Therapy** - Laser Therapy is used to reduce pain, inflammation and speed up healing time. Treatment protocols are different for each condition and patient. We offer laser packages at a reduced cost for those friends that need multiple treatments.

**Spa & Grooming** – We offer full service grooming and bathing for all of our canine and feline friends.

**Wellness Exams & Vaccinations**

**Canine companions** - A physical exam is recommended every 6 months to maintain your pets health. We recommend the Canine Distemper vaccine, Rabies vaccine, Bordetella and Leptospirosis vaccines, intestinal worm checks and heartworm tests yearly. Depending on lifestyle, other vaccinations may be recommended by our doctors.

**Feline Friends** - A physical exam is recommended every 6 months to maintain your pets health. We recommend a Feline Distemper vaccine and Rabies vaccine yearly for all cats. For our feline friends that spend time outdoors, we also recommend the Feline Leukemia vaccine and an intestinal worm check yearly.

Annual blood work is encouraged for all of our younger friends and every 6 months for our senior friends since pets age much faster than we do.

**Membership Plans** - We offer 3 different membership plans for our canine and feline friends to help minimize the cost of yearly preventative medicine.

**Surgery** - Surgeries are performed Monday-Friday. All of our patients will need to be fasted the morning of surgery. Drop off time is 7:30am and pick up times are between 2-5:00pm. We require blood work prior to all surgeries and will also place an IV catheter in each patient. Patients are monitored closely while under anesthesia.



## What First Time Kitten Owners Should Know

Phyllis DeGioia, Veterinary Partner Editor

Revised: November 21, 2023

Published: August 18, 2021

Kittens are supreme experts at getting people to fall in love with them in one glance, so be prepared for that if you go "to just look" at kittens. They are the master manipulators of cute. You may have less choice in the matter than you think, and you may be overwhelmed with the choices.

The prime time for kittens to be born depends on your geographic location, but in the United States, it ranges from April through October.

Kittens make better pets if they stay with their mother until 8 to 10 weeks of age, the time frame during which their normal physical and social development matures. Sometimes, people will find kittens that are orphaned or in miserable shape and take them home. They will likely make good pets, but single bottle-fed babies may not have great social skills.



### The Big Surprise

Kittens can have kittens.

That's what most cat owners don't understand. Cats and kittens are far more like the rabbit's reputation for reproduction than the dog's. Technically, felines can have up to five litters a year, starting really, really soon after they leave their mother.

Female kittens begin their cycles when they are 80% of their adult size, which could be as young as four months of age but is generally more like six months. Many cat owners don't understand this situation, so it's best you know this before you bring home an intact female kitten.

Fun facts:

- Cats can get pregnant during their first heat.
- A cat can go into heat as often as every two to three weeks all year.
- Unlike dogs and women, there is no bleeding to indicate she's ready.
- Unless she's spayed, she will continue to go into heat most of her entire life. Cats don't experience menopause.
- Usually, you can tell if she's in heat by her behavior. She will vocalize more loudly than usual (look up *caterwaul* in the dictionary) while calling to potential mates, lift her rear end up in the air, be more affectionate than usual, roll around the floor, and try to escape the house to find a mate. The symptoms can last anywhere from a few days to two incredibly long weeks.
- She can get pregnant again within a few weeks after she gives birth. Nursing does not prevent conception.
- The feline reproductive system is seasonal, and cats are designed to give birth when it's warm, spring through early fall.

If you would like to avoid all of this, talk to your veterinarian about when the best time is to spay or neuter your kitten.

### Indoor or Outdoor Kitty?

One decision you need to make right off the bat is whether or not you are going to allow your cat outside or if the cat will remain inside at all times. Indoor-only cats are much safer because they don't get hit by cars, have fights with other animals, or become prey, but that means they remain away from their natural environment. Indoor cats need enrichment efforts to be happy and sometimes weight control efforts because cats were not designed to lounge around on the couch all day eating food they didn't hunt. Outdoor cats still need some enrichment inside, though. Outdoor cats can cause harm to the environment by possibly spreading intestinal parasites and diseases that cats and people can get from the cat's feces. If your cat is on a good parasite preventative, the risk is less. Also, outdoor cats can kill songbirds, affecting their population. Understand that your neighbors may not be happy about a cat defecating in their yard or bothering their indoor cats. Your choice should be made by balancing potential dangers outdoors against possible boredom, stress issues, and weight gain indoors.

You can take indoor cats outside for walks on feline-specific harnesses and leashes. You could also create an outdoor cat enclosure called a *catio*, which can attach to your home so they can go in and out at will. If you decide to keep your kitten/cat indoors only, never



Photo by Karen James of VIN

let them out by themselves; if you allow "once in a while" forays into the great outdoors, do not assume they will remain in your yard.

### Equipment You Will Need on Day One

If your kitten is a planned acquisition and you have time to get ready – as opposed to finding some poor scraggly thing late at night in the rain – there are a few basics you should have at home by the day you bring home your kitten.

The only things you absolutely must have immediately for a kitten are food and a litter box filled with litter. Initially, you can use any bowl for water and food, but eventually, you may wish to try food toys and puzzles for enrichment. Stainless steel or ceramic bowls are good.

Food specifically made for kittens is necessary (puppy and dog food do not have enough protein or taurine for felines to live on, although it's better than letting a stray go hungry overnight), and you definitely need litter boxes and litter as soon as you possibly can. In a pinch, a cardboard box filled with sand is good temporarily.

If you know what your kitten was eating before arriving at your house, use that same food. If you'd like to change to something else, mix the two foods together, gradually increasing the percentage of the new food over a few days or a week. If you have no clue what the kitten was eating, then any completely balanced kitten food will do (ask your veterinarian for a recommendation; see more on food below). Cats are obligate carnivores, meaning they must have a meat-based diet. They break down protein to meet their blood sugar requirements, not the carbohydrates that people use. The overall effect of your cat's nutrition can usually be seen in your cat's health; spending more on well-balanced food usually translates to fewer veterinary bills.

### Litter Box and Litter

You will be amazed at how quickly a kitten takes to using a litter box. It will make more of a difference in how well your kitten adapts to your household than anything else you provide. Note that these are two items, not one: a box and litter, both of which come in numerous types. Many cats prefer much larger litter boxes than what is sold in pet supply stores, something like a concrete mixing tub found at hardware stores, but for a kitten, you can start out with a standard-sized box. For one feline, have two boxes in different locations. Some cats like the boxes to be on different floors or at opposite ends of the house. Most dislike having them adjacent to the washing machine and dryer, and they really don't want it near their food bowls. Each box should be scooped clean once or twice every single day, and the litter in it should be replaced every one to two weeks. When you are replacing the litter, wash the empty box with a fragrance-free detergent and make sure it's dry before new litter is put in it.

While it can be tempting to delay scooping or cleaning the box, don't. Just don't. Even though they are kittens, they are fastidious and prefer clean toilets (don't you?). Dirty boxes contribute to behavioral problems in which cats decide to pee and poop outside the box. Sometimes they get in the habit of going outside the box in a way that is appropriately called inappropriate elimination. You want, with all your heart, to prevent your kitten from becoming one of those cats. Inappropriate elimination is one of the main reasons cats are surrendered to the shelter because it is difficult to live with the odor and cleanup of cat urine – which is nasty – and cat poop on your floors and carpeting. The best approach is to prevent it from happening.

Your first decision about litter is clumping or non-clumping. Clumping litter means the urine ends up forming into a sort of ball that is easily scoopable. Non-clumping litter tends to be clay, which some people prefer because of the way it absorbs odors. There is scented (to cover up the smell for your nose), unscented (because some cats don't like the fragrance), lightweight (more uses per bag), dust-free (if either you or the feline have respiratory issues), natural (biodegradable and renewable sources such as corn, wood, pine, wheat, cedar, recycled paper products, etc.) and flushable (check your local ordinances first, as some cities do not allow flushing of pet feces).

Most cats have litter preferences, although some will use any material no matter the texture is or what it smells like. The best way to find out what your cat likes is to offer choices of litter and see which one is used. Try a few different types to make this experiment as accurate as possible and give each option enough time for the kitten to decide.

### Behavior: What is Acceptable, What Isn't

Remember that what is cute for a kitten is not likely to be cute for an adult cat. However, it's easy to train kittens, and training can be the same type of bonding experience it is with dogs. You can train a kitten to use the litter box, to come, to kill the toy, to jump on command, and so on. Use treats to teach them to come by shaking a can of something tasty, so when you need to find the little Houdini, they come to you.

Unfortunately, you can also train the kitten to play-bite with your hand or jump on your moving feet under the covers. It may be adorable when they are three months old, but it's guaranteed not to be so cute in short order. Whatever you want to prevent in your adult cat should not be taught to your kitten, or you may be experiencing it daily for well over 15 years.

### Food

You can unintentionally train your kitten not to eat anything other than the one food they grew up with, which is usually kibble. Adult cats really aren't that picky, it's just that kittens imprint on what you give them, so they seem finicky. They need to be introduced to different foods when they are kittens. If they ever become sick, their salvation may rest in their ability to eat something different, such as therapeutic canned food or kibble that has a different taste and texture. They need to try different types of canned foods, different kinds of meat, dry food, and dehydrated food. They can have one good quality food that is their normal fare, but who knows when you might run out of food or evacuate from a natural disaster, and you want to give something like chicken or fish. If they have urinary problems because they don't take in enough water, they will need to eat canned food. Cats can be so stubborn on this subject that they will starve themselves rather than eat canned food.

Now is a good time to decide if you will regularly feed canned, dry, or a mixture. Cats have taste and texture preferences, and you should see what they like best. Fresh water should be available at all times. Giving at least some canned food every day is a good idea and provides extra moisture. Change up flavors and textures regularly, even in canned – pate vs. shredded - and your adult cat will be much easier to work with should they get sick.

### Vaccinations

Babies of every species are born with immature immune systems. Usually, nature provides protection with antibodies found in the colostrum, the milk the mother produces for the first few days after giving birth, but not all cats have good maternal antibodies and not all kittens get colostrum. While maternal immunity is in the kitten's system, any vaccines given will be inactivated. Vaccines will not be able to "take" until maternal antibodies have sufficiently dropped.

Vaccinations typically start around six weeks of age, and are continued every two to four weeks until the kitten is about four months old. Which vaccines are recommended will depend on your kitten's lifestyle and local ordinances. The reason for revaccinating is due to the window of susceptibility - when maternal antibodies wane – which can be at varied times in kittens, not because a vaccine works better after the prior one. By 14-20 weeks of age, maternal antibodies are gone, and the kitten must be able to continue on their own immune system. Kittens receive a series of vaccines ending at a time when we know the baby's own immune system should be able to respond to those vaccines.

A kitten's vaccination schedule is staggered because vaccinations produce a much greater response if they follow a vaccine given 2-4 weeks prior. Some of those vaccines are good for life, some are not.

What vaccinations your kitten needs and when is often determined by your geographical location. Veterinarians follow the recommendations of the [American Association of Feline Practitioners](#).

### Preventive Measures

Puppies and kittens should be dewormed. Often this is done using products such as [pyrantel pamoate](#), [fenbendazole](#), or [milbemycin](#). The exact schedule will depend on the product being used and your veterinarian's recommendations. Recommendations for ascarid (a type of worm) control in kittens older than six months of age vary. The Companion Animal Parasite Council recommends using parasite control products effective against ascarids monthly. Cats and dogs are susceptible to heartworms so be sure to check with your veterinarian about preventative heartworm medication for your new kitten.

### Enrichment

Environmental enrichment is necessary, especially for indoor cats. Think of it as a boredom buster. Environmental enrichment during kittenhood prevents behavior problems during adulthood. You cannot overdo it. Kittens that are only three weeks old like to play with crinkle balls or bells that make noises (although hopefully, you are not starting out with a 3-week-old kitten). Maybe they didn't have those toys where they were born, so start building their enrichment with those items. By five weeks of age, they can use scratching boards, run through tunnels, jump into cardboard boxes, squeak dog toys, and so on. It can be as simple as shredded paper or crunchy packing paper that you toss on the floor. As long as you don't frighten the kittens, it's okay.

The love of cardboard boxes is a life-long passion with cats: "If I fit, I sit." Kittens like to climb, so carpeted cat trees are fantastic toys, especially when adjacent to a window to the street; a kitten rearranging your desktop is less so.

### Kitten-Proofing

Kittens have no sense of mortality or danger whatsoever and must be protected from themselves. At around eight to ten weeks of age some can be fearful, and they tend not to get into too much trouble, but around 10 weeks, kittens start to practice the art of pure love. They get cuddles, they get kisses, and they get bold and courageous so they jump off things, dash underfoot, chew cords, jump on the hot stove, and play attack the dog. This period will last for a few months.

Help them help themselves by keeping a safe home for them. They will not understand why you need to kitten-proof the house. Because baby kittens are quite able to get to the top of tall dressers or kitchen cabinets, your baby-proofing has to be 3-D, not just the first few inches up from the floor. You may understandably presume for a moment that your 8-week-old kitten has just levitated.

When your kitty is still tiny, double-check the washer, dryer, and dishwasher before you start them because kitties will nap inside. If you have any furniture that reclines, check before you put the footrest down because kitties will find a way to nap in there.

Keep certain "toys" – as they will be viewed by the kitten – out of reach, such as string, yarn, milk-jug bands, hair bands, and the like, as they may otherwise have to be removed surgically.

Start out by giving the wee one a small space, perhaps a bathroom or laundry room, shut off by doors or gates (remember first to check if the kitten is small enough to get through the gate slats because they occasionally seem to go boneless). They should feel safe and comfortable in the small space before they get more space. As they grow, gradually expand their space and gain familiarity with the house. That way they don't lose track of where the litter box is. Houses can be very, very big to small kittens. They are also adept at finding the tiniest, most tucked-away sleeping spots (think of the recliner), so a smaller search area will likely save you some moments of panic searching.

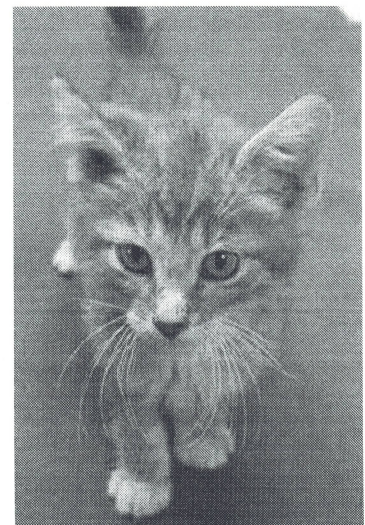


Photo by Dr. Teri Ann Oursler

Don't let them have a free run of the household without supervision. If they get into trouble, they are back to a room with a closed door.

### Scratching

Scratching is a natural behavior of cats. They do it for a couple of reasons, one of which is to mark their territory. They have scent glands on their paws. Scratching removes old nails and allows the growth of new ones. Since their nails are their primary method of protection as well as their hunting weapons, they have an instinct to preserve them. They'll scratch on anything, including your furniture and curtains, so direct them to scratch on appropriate materials, specifically scratching posts. If you get a cat tree, get one with a scratching post and put a couple of scratching posts around the house.

### Hunting

Cats are natural predators. Hunting is hard-wired in them, and there is no way to eliminate it. It has nothing to do with how well-fed they are; they will still hunt if they are not hungry, they just won't consume their prey. Feral cat mothers bring home dead or injured prey to teach their kittens how to eat. Many people get barn cats specifically for rodent control. You can indulge their instinct indoors with certain toys, but there is nothing like live prey. Indoor cats will hunt rodents that come inside.

### Cat Carriers

Unless your kitten arrived as a stray or in a cardboard box, you may already have a [cat carrier](#), but if you don't, you will need one. Your cat will have to go to the veterinarian sometimes, or you may move, your house may catch on fire, or you may need to be evacuated from a natural disaster. There are many types of carriers: some open in the front, or on top, or both; some come apart, and so on. You can [train your cat](#) to accept it. It's much safer for your kitten in there than being held in your arms where they can jump out. You can leave it out all the time, and sometimes toss treats or toys in, so when it is time to go, your kitten does not feel that they are being shoved into some random alien space station.

Also, get your kitten [microchipped](#), and don't forget to register the chip unless your clinic does it for you. Lost cats are returned to owners at much lower rates than dogs in part because of a lack of identifying information (i.e., microchip, collar with tags).

Making an effort to provide your kitten with the tools for a good adult life will pay off wonderfully for the rest of the cat's life. From the day you bring them home until the end of their life, your life will be enhanced by your relationship with this hilariously funny, tender species. May your lives together be filled with joy!

### Toxic Substances for Cats

Cats are a different species, so some things we can eat or ingest may essentially poison them. If you know what your cat has ingested, you can call the [ASPCA Poison Control Center](#) for a fee, at (888) 426-4435, or contact a veterinarian immediately.

- [Alcohol](#)
- [Antifreeze](#)
- Caffeine
- [Cannabis](#)
- [Chocolate](#)
- [Cigarettes](#), nicotine, [e-liquid for electronic cigarettes](#)
- [Dishwashing liquid, detergent/dishwasher tablets](#)
- Fabric softener sheets
- [Grapes and raisins](#)
- [Ibuprofen](#) and naproxen
- [Lilies](#)
- Liquid potpourri
- Minoxidil (Rogaine)
- Mosquito repellent with DEET
- Nasal decongestants
- Onions, garlic, chives
- Pesticides and [rodenticides](#)
- Topical medications
- Wild mushrooms
- [Yeast dough](#)

URL: <https://veterinarypartner.vin.com/doc/?id=10421167&pid=192396f9c07fa-7d64-4c83-8c0c-b2da4752aea71736204515>

The content of this site is owned by Veterinary Information Network (VIN®), and its reproduction and distribution may only be done with VIN®'s express permission.

The information contained here is for general purposes only and is not a substitute for advice from your veterinarian. Any reliance you place on such information is strictly at your own risk.

Links to non-VIN websites do not imply a recommendation or endorsement by VIN® of the views or content contained within those sites.



## Cats, carriers and vets

### Tips on making it easier to get your cat to the vet (or wherever you need to take them)

Many cats are fearful of car rides and veterinary visits, which makes it harder for us to give them good medical care. It also makes it difficult for cat owners to decide to take their nervous cats to the veterinarian for routine care and may delay an examination for an illness. Cats can be trained to be much more comfortable with their carriers, cars, and the veterinary clinic. It takes a little preparation and patience, but will greatly improve your cat's comfort level and our ability to care for your pet. Here are some tips and links that will help you to help your cat! Of course, if you have additional questions, just call us anytime!

The steps to improved carrier behavior:

1. **Start carrier training as young as possible.** Starting as kittens teaches your pet that the carrier is just another fun hiding place, or play area, rather than a confined punishment space. Carriers that load from the top or especially those that come apart in the middle are helpful, as veterinarians can then take the top off and start their examination with the cat comfortably sitting in the bottom. Put the carrier in a room that the cat likes to be in, perhaps in a sunny location, with a soft piece of bedding to encourage exploration and voluntary use.
2. **Encourage daily entry.** Every day, put a piece of kibble or a treat in the carrier. When the cat eats it, calmly praise/pet it and give it a few more treats. If the cat doesn't take the treat right away, just walk away; if you try to persuade the cat, they will become suspicious! It may take a few days, but the cat should start to eat the treats, although maybe when you are not watching.
3. **Gradually close the door.** Once the cat happily goes into the carrier when you are around, gently close the door, give a treat, and open the door so that the cat does not feel trapped.
4. **Extend the door-closure period.** After several days of this, leave the door closed and walk out of the room for a few seconds before returning and giving another treat. Gradually work up to carrying the carrier to a different place in the house.
5. **Begin car rides.** Over days to weeks, move on to placing the carrier in the car, then short car rides, then a ride to our veterinary clinic for a treat (and petting from our staff if your cat is comfortable with it). If at any point your cat becomes nervous (crouching, ears back, etc.), go back a step and give treats until your cat is more comfortable with that level.
6. **Cover the carrier when traveling.** When you start taking the carrier in the car, place a towel over it; cats usually feel safer this way.
7. **Add toys, treats or bedding into the carrier.** If your cat has favorite toys, treats, bedding, or brushes, please bring them to the clinic when you visit (for training visits and the actual exam). This will give your cat more familiar things that he/she associates with good feelings.

8. **Consider using Feliway® (pheromonal anti-anxiety spray) just before traveling.** When the time for the examination arrives, the routine will be familiar and your cat will be much more comfortable. With especially nervous or suspicious cats, Feliway® can help with the initial training period as well.

Some cats, despite your best efforts, still become scared of confinement or travel. In such instances, we can help you by prescribing additional anti-anxiety medications to help alleviate the stress.

Some videos to help you prepare:

<http://www.youtube.com/watch?v=egwBo0o2FN8>

<http://www.catalystcouncil.org/resources/video/?ld=102>

<http://www.catalystcouncil.org/resources/video/?ld=89>

<http://www.catalystcouncil.org/resources/video/?ld=103>



## Importance of Socializing Puppies and Kittens

Jacqueline Brister, DVM

Published: February 05, 2019

### What is Socialization?

The word socialization is a bit misleading when taken literally. Socialization sounds like teaching a puppy or kitten how to socialize with other puppies or kittens. While these kinds of interactions help them learn to act like a normal dog or cat, this is only part of what socialization means and why it is important. It's much more than learning how to interact with other animals of the same species. Domestic dogs and cats don't live in the wild and need to take their cues from more than just their pack mates.

Socialization is getting puppies and kittens used to people, other animals, and experiences that they will encounter frequently in their adult lives. More than just conforming to dog and cat norms, it's learning to accept everything around them, such as people, car rides, grooming, vacuum cleaners, noises, other animals, and other household pets. This involves gently exposing puppies and kittens to new things that they will deal with regularly as adults so that they can react confidently and appropriately rather than fearfully or with anxiety. Socialization is especially important for orphans because they received little if any interaction with their mother and family, and may have no basis at all for how to act around others.

Breed, health, and personality also play a factor in the way a pet behaves with others, even if properly socialized. Some dogs and cats are not as outgoing or social as others and do not enjoy spending time with big groups of people or animals. Socialization is not necessarily about teaching them to want these interactions, but more about teaching them how to handle themselves and communicate appropriately within their environments.

### When to Socialize

Developmentally, the best time for socialization is between 3-14 weeks of age in puppies and 3-9 weeks in kittens. During this period growth, they form relationships and attachments easily. Their senses are more developed, they are more independent, and they are physically capable enough to interact with others. Start socialization efforts as early as possible within this time period to maximize their benefits.

During this key socialization period, any experiences that occur will have long-lasting effects on a puppy's or kitten's future learning and interactions with others. Unfortunately, that means negative experiences will also have lasting effects. It is critical that this time period be positive and safe.

### How to Socialize a Puppy or Kitten

Remember that the purpose of socialization is to have the puppy or kitten interact with other people, animals, and things in order to be comfortable with the environment in which they live. When socializing, it is important to minimize discipline or training. Don't try to reinforce commands or proper behaviors because that takes your pet's attention away from the new experiences. It is also important to balance play with these learning experiences.

Put your pet in situations that she may experience as an adult, such as car rides, being in a carrier, toys, grooming procedures, meeting other animals, meeting new people, and trips to the veterinarian. Introduce your puppy or kitten to new people, animals, and things in a nonthreatening manner, which means it's not scary to the kitten or puppy. If your pet reacts with fear, you likely need to scale back the interaction to the level the puppy or kitten is comfortable. This could mean letting them watch instead of play, distracting them with treats, or moving them farther away from whatever they are afraid of until they become comfortable.

Never punish a fearful puppy or kitten if they are anxious during interactions. This is an important time in their development and creating fearful situations will only lead to more problems in the future. It is also fine for a pet to not interact during these times as socialization is a time for watching and learning; just remember to keep things relaxed.

Gently touch, hold or restrain, and physically interact with your pet every day. This is especially important at an early age because it helps your young pet become comfortable with humans and being handled, and it also helps to speed and enhance their physical and mental development. Puppies and kittens need to interact with non-family members (including children) so they get used to meeting and being around new people when they are adults. Handling your puppy or kitten should include gently touching the face, ears, and paws to make grooming and examinations easier. Restraining them means holding them in place gently and in a non-threatening manner so they can get used to being held and to promote calm demeanors for veterinary check-ups or grooming.



Photo courtesy of Depositphotos

Some veterinary behaviorists suggest that during the socialization period a puppy or kitten should meet 5 to 10 new people each week and that they should experience being in a new place at least once a week. They should be exposed to new sights, sounds, tastes, and smells. Keep things positive and non-threatening with treats, toys, and affection.

#### What if my Puppy or Kitten Isn't Fully Vaccinated?

Spending time with healthy, fully vaccinated animals should be safe for your puppy or kitten. You can arrange play dates with animals you know are vaccinated. However, try to avoid exposing your pet to an unvaccinated animal, such as at the dog park. This is especially true with young animals because they are more vulnerable to infections than adults.

Exposure to puppies and kittens who are not old enough to have received all their vaccines is considered by some to be a calculated risk. This means that while there is a risk for catching a disease, it may not be as much of a concern in the right setting. As an example, a study assessed the risk of infection for parvovirus in appropriately run puppy classes: puppies were otherwise healthy, the place was clean and sanitary, and all the puppies were up to date on vaccines for their age groups. Of 1,012 puppies studied, no increased risk for contracting parvovirus was found when compared with puppies not attending class.

#### Consequences of Not Socializing

Socializing puppies and kittens early within the socialization developmental period has been shown to decrease fear, aggression, and anxiety of new people, animals, or situations. Pets not properly socialized often have an increased sensitivity to new experiences. They are often fearful of people or other animals, even within their own species. This can result in avoiding people or other animals, anxious behaviors, or even hostility or violence towards others. Lack of socialization can also delay development and decrease the puppy's or kitten's ability to learn and make connections about social norms, including sleeping habits and where and when to find food. These issues can make it difficult for them to live easily with others and in some cases may lead to them being re-homed or sent to animal shelters.

Giving your new puppy or kitten (or young animal of any species) significant socialization during that critical stage will pay off handsomely by helping your pet become a confident adult.

URL: <https://veterinarypartner.vin.com/doc/?id=8941891&pid=192396f9c07fa-7d64-4c83-8c0c-b2da4752aea71736204269>

The content of this site is owned by Veterinary Information Network (VIN®), and its reproduction and distribution may only be done with VIN®'s express permission.

The information contained here is for general purposes only and is not a substitute for advice from your veterinarian. Any reliance you place on such information is strictly at your own risk.

Links to non-VIN websites do not imply a recommendation or endorsement by VIN® of the views or content contained within those sites.



Home of Low Stress Handling®  
**CattleDogPublishing.com**  
 A PART OF THE VIN FAMILY

Cats

## Kitten Biting Behavior



**Published:** October 13, 2023

Alison Gottlieb BS, CVT, VTS(ECC) 🇺🇸🐾

Kittens are adorable, tiny creatures who provide hours of entertainment. They nap in the strangest places, purr, cuddle, play, explore their surroundings, and develop bonds with those they live with. For the most part, this is an accurate portrayal of life with kittens, and their occasional mischievous antics are easily forgiven due to their charm. However, there is one behavior that can sometimes test your patience: biting.

Understanding the reasons kittens exhibit biting behavior is crucial for successfully navigating this phase. The kitten biting phase is entirely normal, and with appropriate handling, it remains a phase. If not addressed correctly, it could develop into a more significant issue in adult cats.

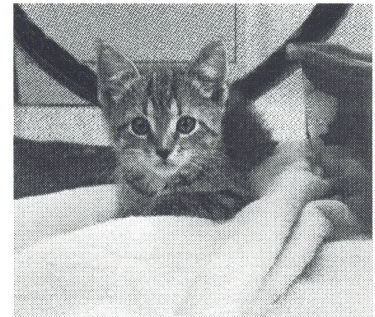


Photo Courtesy of Alison Gottlieb, BS, CVT, VTS(ECC)

### Why Do Kittens Bite?

1. **Exploration:** Like many other species, kittens explore their world using their mouths as one of their primary senses. It is a natural part of their early development. Additionally, teething can lead to biting as incoming teeth cause discomfort.
2. **Predatory Instincts:** Kittens are born with hunting instincts, and biting is a fundamental part of their hunting skills. As they grow, they tend to practice these skills on moving objects, including human hands and feet.
3. **Play:** Play is essential for kittens' development, but they also need to learn when play is too rough. Learning what is too rough is a vital lesson often taught by siblings and housemates. Without other cats or dogs, humans become the educators.
4. **Setting Boundaries:** Kittens may bite to communicate boundaries. This may be a response to being on the receiving end of rough play with other pets and humans in the house. Biting can be a way of expressing that they do not want to engage in play or interaction at that moment.
5. **Fear:** Fear can add to a kitten's biting behavior. Biting serves as a defense when faced with frightening situations. Keep in mind with every kitten, as brave as they seem, everything is a new experience with the potential to be scary.
6. **Attention-Seeking:** Kittens may bite to gain attention. If they receive attention or a strong reaction when they bite, it can become a fun game to get more attention and pass the time during the day.

### Prevention

Understanding the reasons behind kitten biting does not make the discomfort of those tiny teeth any less painful, but it does help prevent them from involving you in their biting games. Preventing unwanted behavior starts with the basics, including providing high-quality nutrition, clean and accessible litter boxes, safe spaces, elevated spots, and affection.

Providing appropriate toys and playtime is crucial in preventing painful interactions. Interactive play allows kittens to learn, exercise, and satisfy their hunting instincts. Stuffed toys or wands with feathers are excellent alternatives to human hands and feet. Toys can even be made by stuffing long socks or purchasing larger kitten-specific toys, allowing your kitten to grab, bite, and kick. Mental stimulation is also essential. Store bought or homemade puzzle feeders can engage hungry kittens and encourage the development of mental and hunting skills.

### Making It Stop

While biting during play or attention-seeking is normal for kittens, the key is the response they receive. If a kitten starts to bite, immediately stop the activity and disengage. This teaches them that biting leads to the end of fun. The same can be said for attention-seeking biting. Giving them any response can teach them biting gets them the attention they are seeking. Use one of the toys listed above to redirect and provide an appropriate biting activity.

When fear is the cause of biting, remove the stressor. Biting usually stops once the source of fear is gone. Remember that kittens find new experiences scary, so introduce them slowly. Create a low-stress environment with hiding spaces to help reduce overall kitten stress.

### What To Avoid

Punishment is not recommended as it limits skill development and may damage the bond with your kitten. Keep in mind these are normal behaviors for developing kittens and they simply need to be taught the appropriate outlet. Punishment does not provide the whole lesson. Loud noises, water squirting, and pushing your kitten away are also discouraged, as they can lead to other undesirable behaviors.

Encouraging rough or mouthing play can reinforce these tendencies and potentially result in biting behaviors in adult cats. Provide a safe environment with plenty of play, affection, and essential needs met to build a strong, lifelong bond with your kitten.

If biting becomes excessive or the above strategies do not improve, seek guidance from your veterinarian or their team.

URL: <https://www.vin.com/doc/?id=11739379&pid=266716f9c07fa-7d64-4c83-8c0c-b2da4752aea7.1736204385>

---

**Friendly Reminder to Our Colleagues:** Use of VIN content is limited to personal reference by VIN members. Please note that while "personal reference" may include downloading or printing the occasional article, mass downloading or printing of VIN content is not permitted. No portion of any VIN content may be copied or distributed without the expressed written permission of VIN.

Clinicians are reminded that you are ultimately responsible for the care of your patients. Any content that concerns treatment of your cases should be deemed recommendations by colleagues for you to consider in your case management decisions. Dosages should be confirmed prior to dispensing medications unfamiliar to you. To better understand the origins and logic behind these policies, and to discuss them with your colleagues, [click here](#).

Images posted by VIN community members and displayed via VIN should not be considered of diagnostic quality and the ultimate interpretation of the images lies with the attending clinician. Suggestions, discussions and interpretation related to posted images are only that – suggestions and recommendations which may be based upon less than diagnostic quality information.



Home of Low Stress Handling®  
**CattleDogPublishing.com**  
 A PART OF THE VIN FAMILY

Cats

## Feline Play and Play Aggression



**Published: December 07, 2022**

Rachel Lees LVMT, KPA CTP, LSHC-Silver, FFCP, VTS (Behavior)

Cats are social animals and enjoy interactions with the humans in their lives. While some cats are particular, others will play with any object, toy, or person. Some cats prefer social play with their owners and some enjoy playing by themselves or with other animals in the home.

Cats come pre-wired with hunting skills. Most cats develop preferences for toys that copy normal hunting behaviors such as stalking, chasing, pouncing, grabbing, clawing, and biting. Typical kitten play behaviors often mimic these hunting skills.

Play postures develop by three weeks of age and can involve social play with other cats and kittens. If cats do not have an outlet, these behaviors may be used inappropriately, resulting in stalking or attacking moving hands and feet. Introducing routines, finding new ways to play, and engaging your cat with healthy play activities encourage positive behavior.

Routines can minimize stress and create a predictable pattern for your cat to know how and when they can play. Play times should be at a time of day that works for your schedule. For example, if you are playing with your cat in the evening prior to bed, make sure playtime ends with a special treat that ends the hunting behavior and encourages rest. Toys such as wands, small mice, and fuzzy balls that encourage chasing and do not directly involve interactions with your hands are best. To keep things fresh, it is recommended to have a few toys out at a time and rotate them every two to three days, creating new excitement with each toy rotation. Food puzzles are another alternative to keep your cat engaged.

Outdoor exploration can be difficult to recreate inside. Supervised outdoor time in a catio or on leash and harness creates other positive ways to play, interact, and stimulate hunting behaviors. Some cats enjoy walks in an enclosed pet stroller or backpack carrier. You may need to condition your cat beforehand.

Understanding different ways to safely play and interact will encourage appropriate behaviors and strengthen the relationship between you and your cat.

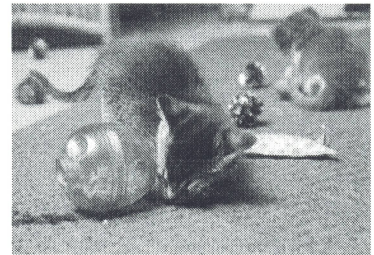


Photo Courtesy Canto Images

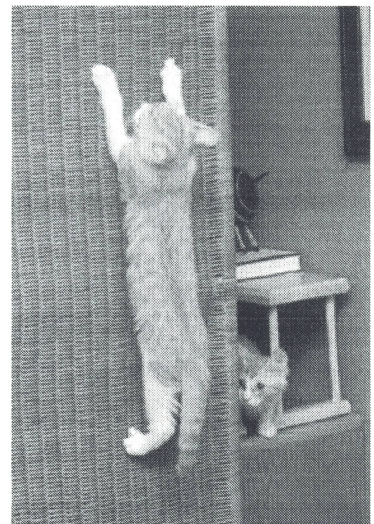
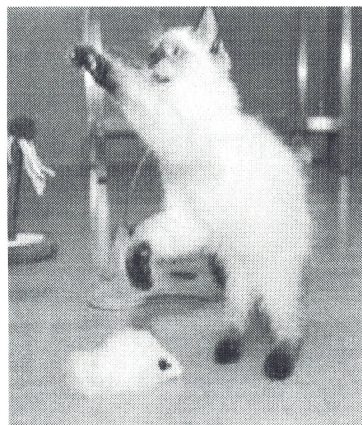


Photo Courtesy Canto Images



URL: <https://www.vin.com/doc/?id=11273009&pid=26671>

**Friendly Reminder to Our Colleagues:** Use of VIN content is limited to personal reference by VIN members. Please note that while "personal reference" may include downloading or printing the occasional article, mass downloading or printing of VIN content is not permitted. No portion of any VIN content may be copied or distributed without the expressed written permission of VIN.

Clinicians are reminded that you are ultimately responsible for the care of your patients. Any content that concerns treatment of your cases should be deemed recommendations by colleagues for you to consider in your case management decisions. Dosages should be confirmed prior to dispensing medications unfamiliar to you. To better understand the origins and logic behind these policies, and to discuss them with your colleagues, [click here](#).

Images posted by VIN community members and displayed via VIN should not be considered of diagnostic quality and the ultimate interpretation of the images lies with the attending clinician. Suggestions, discussions and interpretation related to posted images are only that – suggestions and recommendations which may be based upon less than diagnostic quality information.



## Distemper (Panleukopenia) in Cats

Wendy Brooks, DVM, DABVP

Revised: April 30, 2024

Published: April 18, 2005

Feline distemper, also known as feline panleukopenia, is a very contagious, life-threatening infectious disease of cats. It commonly swoops through a group of cats, especially kittens, leaving a trail of death behind it. Fortunately, vaccination is highly effective and the "feline distemper vaccine" (which also covers [upper respiratory infectious agents](#)) is considered to be the core immunization for all cats, regardless of their lifestyle. Most people have heard of feline distemper only through discussion of routine cat vaccinations, but let's talk about the actual disease.

### The Virus Itself

The feline distemper virus amounts to a single strand of DNA surrounded by a protein coating. It is extremely stable in the environment, which leads to its characterization as ubiquitous (everywhere). It can last a year indoors at room temperature. It survives freezing as well as treatment with such common disinfectants as alcohol and iodine. Fortunately, soaking a surface in bleach (diluted 1 part bleach in 32 parts water) for 10 minutes will kill it.



Photo courtesy Karen James

**Virtually every cat in the world will be exposed to this virus to some extent because the virus lives all around us.**

Infection occurs when the virus enters the body through the mouth or nose. Whether illness results or not depends on the immunity in the victim vs. the number of individual virus particles (i.e. the amount of virus) entering the body.

The feline distemper virus is a parvovirus. Many people are familiar with this term as parvovirus infection is a very real concern for dogs, especially puppies. In fact, [canine parvovirus](#) is closely related to the feline distemper virus and much of the information regarding canine parvovirus is true for feline distemper. The feline distemper virus, however, is more difficult to remove from the environment and more lethal in its victims than its canine counterpart.

### Infection and Disease

An infected cat sheds large amounts of virus in all body secretions, including feces, vomit, urine, saliva, and mucus. The virus persists long after evidence of the original body secretion has faded away. The virus enters the victim's body and proceeds to seek and infect rapidly dividing cells. The lymph nodes in the throat are first to be affected and from there, over the next two to seven days, the virus rushes to the bone marrow and intestine.

In the bone marrow, the virus suppresses the production of the entire white blood cell line, hence the term panleukopenia (literally, "all-white-shortage"). White blood cells are the immune cells needed to fight the infection, and without them, the victim is completely vulnerable to the advance of the virus. In other words, the first order of the virus's business is to eliminate its host's defenses. From there, it continues to the intestinal tract.

There, the virus infects the intestinal cells, causing ulceration leading to diarrhea and life-threatening dehydration as well as bacterial infection as the barrier between the body and intestinal bacteria is lost. The patient dies from either dehydration or secondary bacterial infection. The infection can be so rapidly overwhelming that death occurs before the vomiting and diarrhea even begin.

Because most cats are exposed to this virus to some extent, it is unusual for a kitten to have no immunity whatsoever. Furthermore, the vaccine is so effective that even one dose can provide long-lasting protection. As a result, infection is largely limited to unvaccinated younger animals kept in groups such as a colony of barn cats, feral cats, or even a group of shelter cats. Viral numbers (the amount of virus) must be large enough to overwhelm a cat's partial immunity, but once virus-laden diarrhea begins to gather in the environment, those large numbers can be reached. Death of sick cats is typically considered to be 90%, though it has been said that a kitten who survives the first 5 days is likely to survive the infection.

**Recovered kittens are considered contagious for six weeks following recovery.**

### Cerebellar Hypoplasia

A specific syndrome occurs if infection occurs during pregnancy. If infection occurs in mid or early pregnancy, the kittens simply abort. If the kittens are fairly far along, the cerebellum is involved, leading to [cerebellar hypoplasia](#). The cerebellum is the part of the central nervous system that coordinates balance and movement, enabling one to walk or run on

an uneven surface without consciously thinking about it. Without a normal cerebellum, the kitten is born with marked intentional tremors: whenever he focuses on purposeful movement, he tremors so much that normal movement is impossible. Such kittens are called wobbly cats and are notably abnormal but are considered to have good life quality and can be kept as pets as long as they are looked after.

#### Diagnosis of infection

Any kitten with fever, appetite loss, diarrhea, and/or vomiting is a suspect for feline distemper. Classically, a white blood cell count shows almost no white blood cells; there are few causes of white cell counts this low and the infection can be considered confirmed.

The SNAP Fecal ELISA test kit made for canine parvovirus is often used in cats as a means to reach a distemper diagnosis. This test detects parvovirus in stool and is felt to be accurate although the test is not specifically labeled for this use by the manufacturer. Vaccination 5-12 days before running the test can lead to a false positive test as the virus from the vaccine will be detected. It is important to keep this information in mind when using this test to make a diagnosis; recent vaccination will cause a false positive.

If a dead kitten is available for necropsy (that's an autopsy in animals), the infection is readily confirmed by laboratory tissue analysis as there are unique tissue findings in feline distemper.

Virus isolation, PCR testing, and antibody level measurement are also potential tests for feline distemper.

#### Treatment

An infected cat can recover if the cat can be kept alive until the immune system recovers from the panleukopenia and can throw off the infection. This means that invading intestinal bacteria must be kept at bay with antibiotics and aggressive fluid therapy must control dehydration. Hospitalization is required as fluids and medications must be given intravenously. Blood sugar must be supported as well and control of pain, nausea, and hypothermia is crucial. This is essentially the same therapy as for canine parvovirus infection, though the feline experience seems to be more lethal. There is little chance of survival without hospitalization.

#### Recovery

If a cat is lucky enough to recover from this infection, generally, no permanent damage is retained, and the cat goes on with lifetime immunity.

The distemper virus is shed for up to six weeks after recovery.

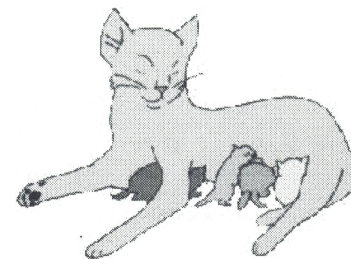
Disinfecting the environment after infection is a huge challenge; the best protection for newly introduced cats will be vaccination. That said, bleach diluted 1:32 in water with a 10-minute contact time will kill the distemper virus, so it would be prudent to bleach any surfaces that can be bleached.

#### Prevention

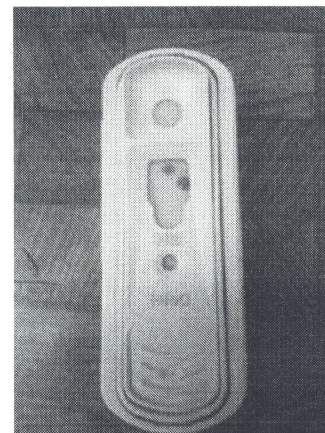
The American Association of Feline Practitioners (AAFP) suggests starting kitten vaccinations at 6-8 weeks old, with boosters every 3-4 weeks until they reach 16 weeks. A follow-up shot is given one year after the initial series, then every three years. Cat's antibodies from their mothers usually fade by 12 weeks, but the final FPV vaccine is recommended at 16 weeks. In some cats, these antibodies may last up to 20 weeks. Your veterinarian will recommend an appropriate vaccine schedule for your cat depending on their age and other health factors.

- Vaccination, at least with a live vaccine, should be avoided during pregnancy as cerebellar hypoplasia (see above) can result in the kittens.
- Vaccination is generally given every one to three years depending on the protocol of the animal hospital.
- Vaccination can be given as an injection (either modified live or killed virus vaccine) in the right front leg area or can be presented as a nose drop.
- Killed virus vaccine has been associated with vaccination-associated fibrosarcoma (an aggressive cancer) in rare individuals.

Research is continuing in this area; however, the killed virus vaccine has largely been replaced by a modified live virus vaccine, which is not thought to have this problem.



Graphic courtesy MarVistaVet



A positive test. Courtesy MarVistaVet.

URL: <https://veterinarypartner.vin.com/doc/?id=4952250&pid=192396f9c07fa-7d64-4c83-8c0c-b2da4752aea71736204710>

The content of this site is owned by Veterinary Information Network (VIN®), and its reproduction and distribution may only be done with VIN®'s express permission.

The information contained here is for general purposes only and is not a substitute for advice from your veterinarian. Any reliance you place on such information is strictly at your own risk.

Links to non-VIN websites do not imply a recommendation or endorsement by VIN® of the views or content contained within those sites.





## Feline Immunodeficiency Virus (FIV)

Wendy Brooks, DVM, DABVP

Revised: October 10, 2024

Published: November 05, 2002

### What is FIV?

FIV stands for feline immunodeficiency virus, just as HIV stands for human immunodeficiency virus. In fact, these two viruses are closely related, and much of the general information that has become common knowledge for HIV also holds true for FIV. FIV is a virus that causes AIDS in cats; however, there is a long asymptomatic period before AIDS occurs, and our job is to prolong this asymptomatic period.

The life expectancy of the FIV+ cat is variable. Approximately 18% die within 5 years of infection. An additional 18 percent are still alive in that time frame but are experiencing illness from their immune-suppressed state. The remaining cats appear normal in that time frame, and many go on to live long lives, only periodically experiencing illness.

For a lengthy description of this virus, visit the [Cornell Feline Health Center](#).

Also helpful is information from the [American Association of Feline Practitioners](#).

### How is a Diagnosis Made?

Most of the time, FIV infection is discovered using a screening test performed in your vet's office or on a blood panel. Once a cat has been identified as positive by a screening test, it is best to confirm with an additional test of a different type, such as a PCR test or Western Blot, to add an extra degree of certainty. Once this test is positive, the cat is considered to be truly infected.

Kittens less than six months old may test positive due to the antibodies passed from their mother. Such kittens should be retested when they are over six months old.

In a household with multiple cats, it is important to test all the cats when one cat comes up FIV+ as it is important to know who is infected and who is not. Cats that test negative should be tested annually as they are at higher risk for infection, even though it is generally considered unnecessary to isolate the negative and positive cats from each other. Knowing a cat's status tells you which cats need to follow the guidelines listed on this page.

It should be noted that giving the FIV vaccine will cause a cat to test positive on both of the above tests. PCR testing is generally not used for screening but is able to detect viral DNA. It can be used to distinguish an FIV-infected cat from an FIV-vaccinated cat. The FIV vaccine has been withdrawn from the U.S. and Canadian markets, not for safety reasons but because it has never been widely embraced by the veterinary profession due to the testing ambiguity situation.

### Testing Kittens

While screening a new kitten for Feline Leukemia Virus and FIV is considered crucial to the adoption process, it is important to understand what a positive FIV test means in a kitten under six months of age. Testing is generally done on a new kitten either before adoption or shortly after. The in-house test takes about 15 minutes to run, and the FIV portion of the test is a test for FIV antibodies. The mother cat with FIV rarely transfers the virus to her kittens, but she most certainly will transfer her antibodies (usually during nursing). This means that a positive FIV test in a kitten most likely indicates that the mother was FIV+. It will take some time for transferred antibodies to wane, so a positive test in a kitten flags the kitten for testing later on (usually around age 6 months or after). After this period, the kitten should be retested. Most kittens will revert to a negative status after their mother's transferred antibodies have worn off.

### How did my Cat get Infected?

The major route of virus transmission is by the deep bite wounds that occur during fighting. There are other means of spreading the virus, but they are less common. FIV can be transmitted sexually and via improperly screened blood transfusions. Casual contact, such as sharing food bowls or snuggling, is very unlikely to be associated with transmission. As mentioned, infected mother cats do not readily transmit the virus to their kittens. Mother-to-kitten transmission requires the mother to be at an early stage of her own infection in order to transmit the virus. Kittens testing positive for FIV generally will revert to negative once their mother's antibodies wear off.

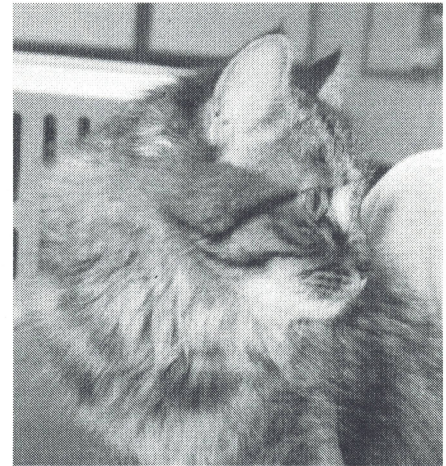


Photo courtesy Dr. Teri Ann Oursler

**Isolation of an FIV+ cat is unnecessary in a stable household unless the FIV+ cat is likely to fight with the other residents. That said, it is important not to introduce any new cats as this is likely to lead to fighting and consequent virus transmission.**

What do I do Now?

Some lifestyle changes will probably be needed now that you know you have an FIV+ cat.



Photo courtesy Laura Hedden

#### *Keep your Cat Indoors Only*

Now that you know your cat has an infectious disease, the responsible thing is to prevent the spread of this disease in your community. This means that your cat will need to be an indoor cat not just for the good of the community but also to minimize their exposure to infectious diseases. Cats who are used to living outdoors will make a fuss about being allowed outside. It is crucial that you do not give in, as this will simply reinforce the crying and fussing. If you just allow the fussing to run its course, it will cease, and the cat will get used to the new indoor-only life.

Cats who are inclined to slip past people entering the home when the door is open can be managed by leaving them in a closed room when someone is out of the house. This way, when someone arrives home, the cat does not have access to the front door.

#### *No Raw Foods*

There are currently numerous fad diets involving raw foods for pets. It is crucial that one not succumb to these popular recommendations when it comes to the FIV+ cat. Uncooked foods, meats especially, can include parasites and pathogens that a cat with a normal immune system might be able to handle but an FIV+ cat might not. Stick to the major reputable cat food brands.

#### *Vaccination*

There is some controversy in regard to what is best for vaccinating an FIV+ cat. Unlike the FeLV+ cat, which probably requires more frequent vaccination than the average cat in order to get a decent immune response, there is some evidence that vaccinating the FIV+ cat may encourage the virus to activate. This evidence involves cultured lymphocytes in test tubes, however, not actual infected cats. If you live in an area where vaccination is legally required, then you should continue to vaccinate your cat normally. Similarly, if your cat goes outdoors despite the above recommendation, then you should continue to vaccinate your cat normally. If your cat is indoors only and no other cats in the home go outside, then it is reasonable to forgo vaccination unless they come to be required for boarding or for elective veterinary procedures.

#### *Parasite Control*

The last thing an FIV+ cat needs is fleas, worms, or mites, especially now that he is going to be an indoor cat. There are numerous effective products on the market for parasite control. Consult with your vet about which parasites you should be especially concerned with and which product is right for you.

#### *Immune Stimulating Agents*

There is an assortment of products on the market claiming to stimulate the immune system. Most of these do not have adequate science behind them to justify recommendations.

LTCI made by TCyte® is an injectable immunomodulator. It was originally produced as a product for FIV + cats and can still be obtained for this use, but, more recently, TCyte has gained FDA approval for their product for dogs with arthritis and has shifted their marketing efforts to this objective. The original information for cats can be obtained by contacting the company.

#### *Antioxidants*

Oxidative stress is rather a long story and has been implicated in the development of cancer, age-related degeneration, and other disease states. In short, oxidative stress stems from reactive oxygen compounds that are generated by our metabolism. The oxygen compounds are able to damage DNA unless they are "scavenged" (rendered harmless) by either the natural antioxidant systems of our bodies or by antioxidant supplements we take orally. Oxidative stress has been implicated in the progression of HIV infection in humans, and it has been extrapolated that the same is true of FIV infection in cats. A 2008 study by Webb et al published in the *Journal of Feline Medicine and Surgery* looked at an antioxidant called Superoxide Dismutase in FIV cats and found an improvement in the CD4+ to CD8+ ratio in supplemented cats. This is a promising finding, though cats were only followed for a 30-day period, and indicates that further studies may show more substantial clinical benefit. What this all means is that oral antioxidant supplementation may be helpful in keeping FIV+ cats healthy. While the jury is still out as to how significant a treatment this is likely to become, it is certainly clear that antioxidant supplementation may be beneficial on a number of planes and may be worth a try.

#### *General Monitoring*

While a non-geriatric FIV- cat should have an annual examination, the FIV+ cat should have a check-up twice a year. Annually, a full blood panel and urinalysis are wise. Also, it is important to be vigilant of any changes in the FIV+ cat. Small

changes that one might not think would be significant in an FIV- cat should probably be thoroughly explored in an FIV+ cat. Any weight loss, in particular, should be addressed.

Keeping your cat indoors is the most significant step in disease prevention that you can do. The feline immunodeficiency virus is not transmissible to humans in any way.

#### What about Medications Used in HIV+ Humans?

AZT (brand name Retrovir®) is a prominent antiviral medication for the treatment of human HIV infection. Tests in FIV+ cats indicate that those with either neurologic signs or stomatitis (oral inflammation) may benefit most. At this time, at least (in cats), AZT seems to be something to save for when symptoms of viral infection appear. There are some bone marrow issues with red blood production, and some periodic monitoring tests are advisable. If problems arise, fortunately, they are reversible and should resolve within a few days of discontinuing the medication.

Drugs other than AZT seem to have more potential for toxicity and are not recommended for feline use.

#### The Immune-Suppressed Owner

Immune-suppressed cats and immune-suppressed owners do not mix well. Those who are immune suppressed, be they human or non-human, are inclined to become infected with opportunistic organisms and, in turn, shed larger numbers of those organisms than one might naturally come into contact with in the environment. This means that someone who is immune-suppressed (human or not) can serve as an amplifier for infectious agents. An immune-suppressed cat can increase an immune-suppressed human's exposure to infectious agents and vice versa. This is obviously not a good situation. The same is true for multiple immune-suppressed cats living together. If possible, there should be only one immune-suppressed individual per home.

Read more material for HIV+ individuals concerned about [pet-to-human disease transmission](#).

URL: <https://veterinarypartner.vin.com/doc/?id=4951815&pid=192396f9c07fa-7d64-4c83-8c0c-b2da4752aea71736204442>



Photo courtesy Dr. Teri Ann Oursler

The content of this site is owned by Veterinary Information Network (VIN®), and its reproduction and distribution may only be done with VIN®'s express permission.

The information contained here is for general purposes only and is not a substitute for advice from your veterinarian. Any reliance you place on such information is strictly at your own risk.

Links to non-VIN websites do not imply a recommendation or endorsement by VIN® of the views or content contained within those sites.



## Feline Leukemia Virus (FeLV)

Becky Lundgren, DVM

Revised: August 22, 2023

Published: July 12, 2003

Feline leukemia virus, a retrovirus, is a common infection of cats. It is the cause of more cat deaths, directly or indirectly, than any other organism and is widespread in the cat population.

### Disease Transmission

FeLV transmission most commonly occurs through close social contact. Contact with saliva from infected cats is a primary mode of transmission because the concentration of the virus is high in saliva. But the virus is also shed in blood, urine, feces, nasal secretions, and milk. Sharing food and water dishes, using the same litterbox, mutual grooming, and bite wounds are all possible methods of transmission. Infected queens can infect fetuses during pregnancy. Infected queens can infect neonates when the babies drink the infected milk. Transmission can also happen via blood transfusions or contaminated needles/instruments.

### Disease

There are four separate classes of infection: abortive, regressive, latent, and progressive.

- **Abortive infections** are those in which the exposed cat produces an effective and early immune response. This prevents viral replication and eliminates virus-infected cells. These cats are negative for circulating viral antigens and viral genetic material.
- **Regressive infections** are those in which viral replication is limited, but a small population of virus-infected cells remains. These cats are antigen-negative, but the virus can be detected in a small percentage of blood cells by polymerase chain reaction (PCR), a type of blood test. These cats may go on to eliminate the virus completely. These infected cats are not viremic (and therefore not contagious), but may be infectious through blood transfusion.
- **Latent infection** refers to the cats in which a moderate amount of infected cells remain. These cats are antigen-negative but PCR-positive. The latently infected cells do have the potential for the virus to re-activate, but the cats are not contagious as long as the infection remains latent.
- **Progressive infections** are those in which virus replication is not eliminated; both viral antigen and genetic material can be detected in the blood of these cats. The cats are actively shedding virus (primarily in saliva and feces). These cats are likely to become ill with FeLV-related disease.

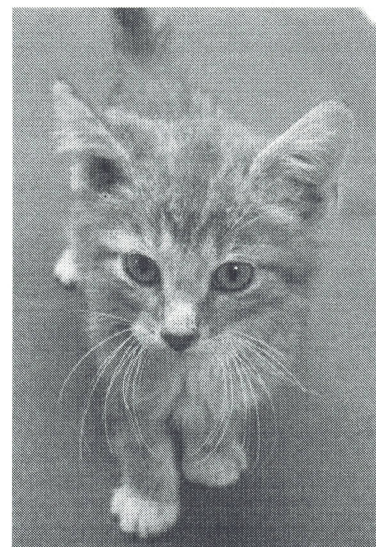


Image Courtesy of Dr. Teri Ann Oursler

### Are There Clinical Signs?

There are no specific clinical signs associated with this disease.

FeLV infection can lead to several distinct types of syndromes, including:

- Cancers (leukemia, lymphoma, fibrosarcoma, osteochondroma, etc.)
- Neurologic problems may occur secondary to lymphoma and infiltration of the brain and spinal cord. The virus itself may be toxic to the brain and spinal cord.
  - The neurologic signs may include abnormal behavior, vocalization, hyperesthesia, muscle weakness, paralysis, anisocoria (differently sized pupils), urinary incontinence, and blindness.
- Blood diseases (including bone marrow suppression, hemolytic anemia, neutropenia, platelet disease, etc.)
- Immunosuppressive disease
  - Increased number of secondary infections, including respiratory infections and fever
  - Because various body systems can be affected, cats may experience: enteritis (inflammation of the small intestine), liver disease, jaundice, bruising, abortion, fading kitten syndrome, cutaneous horns, kidney disease,

enlarged kidneys, enlarged spleen, uveitis (eye redness and inflammation), polyarthritis (arthritis in multiple joints), weight loss, etc.

- Decreased antibody production
- Decreased numbers of lymphocytes (a type of white blood cell that protects the body against infections)
- Decreased immune response

**Because the disease impacts many systems, if a previously untested cat doesn't respond to the normal/usual treatment for a disease process, your veterinarian may consider that FeLV could be hampering recovery and will recommend testing.**

#### Diagnostic Tests

Necessary diagnostic tests may include blood chemistry, hematology, radiography, bone marrow aspiration, ophthalmoscopy, and specialized antibody tests.

#### Treatment

There is no effective treatment for the myeloproliferative (bone marrow) form of leukemia. Treatment is mainly supportive and may require blood transfusions, prednisone, and anabolic steroids.

FeLV cancer (lymphoma) has a better response to therapy than myeloproliferative diseases do. Treatment may include chemotherapy, glucocorticoids, interferon, Protein A, and supportive treatment.

#### Prognosis

The prognosis for infected cats is highly variable. It depends upon the specific disease the cat gets during the course of infection and the availability of supportive treatment for secondary infections. A small percentage of FeLV-positive cats may remain healthy for several years, but the prognosis for persistently FeLV-positive cats is poor, as most of the infected cats living within cluster households will die within three years from the time of diagnosis.

#### Prevention Of FeLV

There are several preventive measures that can be taken to decrease the risk of contracting FeLV. Routine testing, as well as vaccination of cats determined to be at risk, are key factors in FeLV prevention.

- Adult cats can be FeLV tested, and then vaccinated if they are negative. FeLV vaccination of infected cats does not affect the carrier state, the capacity to infect other cats, or the development of disease in the infected cats. Booster vaccinations are generally used in adult cats only if they have continuing risk of exposure.
- Cats are most vulnerable to the virus as kittens. Kittens should be vaccinated with a recombinant vaccine. Leukemia is almost entirely preventable with just two kitten vaccines and a booster one year later. After that, even if the cat is exposed, the vaccines will help protect it -- plus the cat will naturally be more resistant to infection because of its age. Kittens may be tested at any age. However, infection in newborn kittens may not be detected until weeks to months after birth. Therefore, several FeLV tests during the first six months of life may be necessary to feel completely "safe" about a negative test result.
- All kittens or adult cats that test negative by the first ELISA screening test, but with a known or suspected exposure to FeLV, should be retested. Although the majority of cats will test positive within several weeks, the final retest of negative cats should be no sooner than 90 days post-exposure.
- In large catteries, a test and removal program can be instituted.
- Multi-cat households with FeLV positive cats should be maintained as a closed colony. (No new cats should be brought into the household to prevent the spread of infection to the new arrivals.)
- Healthy FeLV-infected cats should be housed indoors and kept away from other cats to limit the risk of disease transmission; veterinary checks should be performed at least every six months.

#### Notes

Retroviruses are unstable, live for only minutes outside the cat's body, and are readily destroyed by most disinfectants.

Because the feline leukemia virus is so unstable, a new, healthy cat can be brought safely into a "contaminated" house within days of the departure of an FeLV-infected cat.

#### Public Health Implications

FeLV has been the subject of many studies. Although human infection with FeLV might be possible, no human has ever been known to become infected with FeLV. Also, no human leukemia has ever been traced back to FeLV infection. Currently, FeLV in cats is not regarded as a human health hazard.

URL: <https://veterinarypartner.vin.com/doc/?id=4951934&pid=192396f9c07fa-7d64-4c83-8c0c-b2da4752aea7.1736204488>

The content of this site is owned by Veterinary Information Network (VIN<sup>®</sup>), and its reproduction and distribution may only be done with VIN<sup>®</sup>'s express permission.

The information contained here is for general purposes only and is not a substitute for advice from your veterinarian. Any reliance you place on such information is strictly at your own risk.

Links to non-VIN websites do not imply a recommendation or endorsement by VIN<sup>®</sup> of the views or content contained within those sites.

ENRUC



## Herpes Viral Conjunctivitis: A Feline Problem

Wendy Brooks, DVM, DABVP

Revised: September 16, 2023

Published: December 02, 2002

The conjunctival membranes of the eye are basically the pink part under the eyelids and the lining of the eyelids themselves. When they are irritated, they redden and can become itchy, dry, and uncomfortable. The cornea, or clear dome-like covering of the eye, can become involved in the inflammation. It can become cloudy or even ulcerated. Tear production can be reduced, leading to a chronically dry, uncomfortable eye.

Conjunctivitis in cats is typically of viral origin, and usually, that means a herpesvirus (feline herpesvirus-1 to be specific) infection. Herpesviruses grow in the tissues of the body that interface with the environment, such as the upper respiratory tissues and conjunctivae. The infection begins with an initial phase that is usually the most severe in terms of symptoms. This phase resolves, but the virus itself does not go away; instead, it retreats into the neurologic structure in the head called the trigeminal ganglion, where the patient's immune system holds it prisoner. In times of stress, the immune system is taxed, and the virus is able to escape from the ganglion, traveling out via the nerves exiting the ganglion. The result is the return of symptoms. In this way, the infection is permanent but the symptoms of the infections come and go.

Symptoms include conjunctivitis as described above but also nasal and respiratory symptoms such as sniffles, runny nose, and fever, basically the symptoms of an upper respiratory infection. As mentioned, the first episode is generally the worst, and subsequent episodes are more mild. Recovery typically begins after 10-14 days of symptoms, and the episode resolves within three weeks. The virus is spread by close contact (usually direct contact) with an infected cat. Herpes virus is very contagious among cats, which means that infection is very common even in cats with no symptoms.

As mentioned, the first episode is generally the worst, and subsequent episodes are more mild.

### Baby Kittens: A Special Situation

Herpes infection is a special problem in young kittens, especially those facing stresses beyond just their young age (fleas, poor nutrition, environmental cold, etc.).

Feral kittens, waifs of the streets, outdoor kittens, shelter kittens, etc., are all at high risk for herpes infection. Young kittens can produce so much ocular discharge that their eyes gum closed, sealing the infected secretions around the eye. It is important that the eyelids be opened manually to allow drainage of secretions as well as the application of medicine. The swelling of the conjunctivae can be so severe that the eye itself is not visible.

In severe cases, the eye can rupture and become permanently blinded. Treatment is crucial, and response to topical therapy is usually dramatic.

As mentioned, herpes infection typically causes respiratory signs as well: snotty nose, congestion, etc. These signs can result in life-threatening loss of appetite and dehydration in a young kitten, while signs are generally minor in an adult cat whose immune system is mature. Kittens with obvious discomfort should be examined by a veterinarian. Oral antibiotics will most likely be needed and sometimes hospitalization is also necessary for proper supportive care.

### Adult Cats

Since kittens are so commonly affected with herpes, it is not unusual to find oneself in possession of an adult cat with a history of herpes infection. These individuals will have recurring conjunctivitis in times of stress. Typical signs include squinting slightly in one eye, a noticeable increase in eye discharge (usually brownish in color), redness of the conjunctivae, or all of the above.

How do we Know it is Herpes?



Kitten with herpes infection. Note the irritated eyes.  
Image courtesy of Dr. Wendy Brooks.



A young kitten with herpes conjunctivitis. Image courtesy of Dr. Wendy Brooks.

Adult cat with herpes  
conjunctivitis

Basically, any infection that creates an upper respiratory infection will also cause conjunctivitis; herpes is not the only such infection. Often, several agents of upper respiratory infection are active in the same cat at the same time.

The chances are that it will not be worthwhile to determine which agents are there; it is more practical to treat bacterial agents and secondary bacterial infections first and then see if antiviral medications turn out to be needed.

Right now, the most sensitive test for herpes is PCR testing. This test is able to detect even small amounts of herpes DNA and is much more sensitive than the prior form of testing, which involved antibody levels. The problem is that herpes infection is so extremely common that most cats in any given area are going to test positive, indicating they are harboring the virus in their bodies. Having a herpes infection is not the same as having an active herpes infection, so testing a cat will determine if the cat is harboring herpes but will not determine if herpes is presently active.

So, how do we know it's herpes? We probably will not know for sure without a test but if a stressed cat has conjunctivitis involving the cornea, the chances are that herpes is afoot.

How Can we Treat it?

There are several treatment methods that can be combined in the treatment of feline herpes eye infections.

#### *Topical Antibiotics*

Topical antibiotics quell secondary bacterial invaders and are helpful in controlling the severity of symptoms because secondary bacterial infections frequently complicate Herpes conjunctivitis. It is important to realize that antibiotics do not affect the herpesvirus itself; they only work on secondary bacteria; however, often, this is enough to make the cat comfortable until the virus goes dormant.

#### *Topical Anti-virals*

There are several eye drops available that act directly against the herpes virus. They include idoxuridine (no longer commercially available and must be obtained from a compounding pharmacy); Viroptic® (trifluorothymidine); cidofovir (which also must be obtained through a compounding pharmacy), and Vira-A® (vidarabine). These medications are relatively expensive and typically require administration five times daily with the exception of cidofovir, which accumulates in the eye tissues and allows for twice daily dosing. This sounds great, but there are some toxicity issues to be reviewed if one is truly contemplating this latter therapy.

#### *Oral Anti-virals*

While antibiotics have been around for decades, antiviral medications have been much more elusive. Famciclovir was developed as a herpes treatment for humans and has been found effective for feline herpes as well. While doses and protocols are still being worked out, higher doses of oral famciclovir translate into therapeutic famciclovir levels secreted in tears, effectively creating a topical treatment from an oral product. Because the topical antivirals are frequently inconvenient to use, oral famciclovir combined with a topical antibiotic makes a fair approach to feline herpes conjunctivitis.

It should be noted that some infections lend themselves to prevention by the vaccination process, and others do not. Herpes does not; this means that vaccination of healthy cats does not prevent infection for feline herpes; what it does do is lead to less severe signs. Vaccination against feline herpes has been deemed helpful but one should understand that, in this case, the goal is not total prevention of infection but palliation.

- **Probiotics**

Fortiflora®, the probiotic powder made by Purina, has been found to decrease the severity of herpes conjunctivitis when added to the diet.

- **Hyaluronate Eye Drops**

Hyaluronate administered topically is highly supportive to the mucus-producing cells of the conjunctivae. This helps the eyes maintain proper wetness. Stabilizing the tear film in this way helps maintain not only patient comfort but also helps the eye wash away inflammatory products generated by the infection.

#### Eosinophilic Keratitis: A Possible Result of Chronic Infection

An especially unpleasant possible outcome of feline herpes infection involves thick white plaques forming on the surface of the eye. A scraping from the plaque can be examined under the microscope for white blood cells called eosinophils, and if they are found, the diagnosis of eosinophilic keratitis is confirmed. The plaques are an inappropriate immunologic reaction to the virus, so immune suppressive topical medications are needed to suppress the reaction. Life-long treatment is typically necessary.

#### Corneal Sequestrum: Another Possible Result of Chronic Infection

The Persian breed appears to be particularly predisposed to this reaction to the herpes virus. Here, a section of the cornea actually dies and turns black or dark brown. The fastest route to resolution involves surgical removal of the dead tissue and application of a tissue graft. Not all veterinarians are comfortable doing this surgery, or have the necessary equipment, so

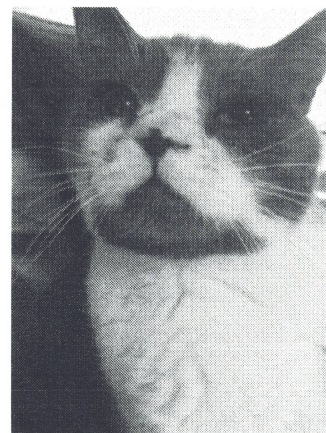


Image courtesy of Dr. Wendy Brooks.

discuss with your veterinarian whether a referral to a veterinary ophthalmologist is in your and your pet's best interest. Non-surgical management is possible with antibiotics and anti-inflammatory topicals but a specialist is best consulted should this complication of infection arise.

#### Can Humans get Feline Herpes? Can Cats get Human Herpes?

Thankfully, humans and cats cannot share their herpes viruses. Feline herpes is contagious among cats only, and human herpes is contagious among humans only.



URL: <https://veterinarypartner.vin.com/doc/?id=4951824&pid=192396f9c07fa-7d64-4c83-8c0c-b2da4752aea71736204771>

The content of this site is owned by Veterinary Information Network (VIN®), and its reproduction and distribution may only be done with VIN®'s express permission.

The information contained here is for general purposes only and is not a substitute for advice from your veterinarian. Any reliance you place on such information is strictly at your own risk.

Links to non-VIN websites do not imply a recommendation or endorsement by VIN® of the views or content contained within those sites.

© 2015



## Heartworm Infection in Cats

Wendy Brooks, DVM, DABVP

Revised: April 20, 2023

Published: January 01, 2001

### Do Cats Get Heartworm?

The answer to this question is an unequivocal yes, but feline heartworm disease is a lung disease rather than a heart disease as it is in dogs. The parasite is the same but because the heartworm's natural host is not a cat, the interaction between worm and host creates a very different condition. It isn't good for either the cat nor is it good for the worm.

### When Heartworm Meets Cat: The Biology

The story begins with a mosquito, just as in the canine situation. The mosquito feeds on a heartworm-infected dog, the heartworm microfilaria (the youngest larvae) are sipped up into the mosquito during feeding, and develop in the mosquito's body for the next couple of weeks. This is all according to the plan for the heartworm's life cycle until the mosquito bites a cat instead of another dog.

In the third stage, larval heartworms enter the cat's body and develop in the tissues. The feline body is an inhospitable host and worm development is fraught with immunological attack. By the time the larva has reached its 5th stage, it is on its way to the pulmonary arteries to complete its maturation but most infections will end here as the feline immune system is nearly relentless in its assault. At best, only about 25% of the original infecting larvae will survive to adulthood, which means most infections are aborted in this last stage of larval development.

Most cats with adult heartworms only have a few worms (1-3 on average) and development to the adult stage takes an extra couple of months in the feline body compared to the canine body. Chances are that there will be a single sex worm population rendering worm reproduction impossible. Only about 20% of feline infections produce microfilaria (youngest worm larvae); further, the feline immune system is so aggressive that the larvae only live a matter of weeks whereas they can live for up to 2 years in a dog. When the adult/parent worm dies inside the cat, a huge amount of inflammation is generated, and many cats do not survive this stage. If the cat does survive, there is likely long-term damage to the lung tissue.

It is unclear what percentage of an area's feline population will be infected. The standard statistic is that a region's feline incidence will be approximately 10% of the canine incidence but this appears to be a low estimation since feline infection cannot be defined by the presence of adult worms.

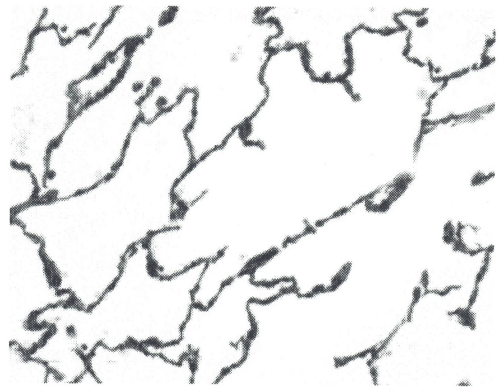
- Cats living in heartworm areas should be given heartworm prevention medications just as dogs should.
- In one study, 25-30% of heartworm-infected cats were described as being indoor cats. Many mosquito species are not shy about entering homes.

It turns out that heartworm disease in cats is not really comparable to the canine disease. In dogs, the disease is vascular (adult heartworms cause trouble by plugging up the pulmonary arteries and generating inflammation there). Adult heartworms make it to the dog's pulmonary arteries after a long maturation process that starts with a tiny larva being deposited adjacent to a mosquito bite in a tiny droplet of mosquito saliva. The baby heartworms do not cause much trouble in dogs and it is not until they have reached substantial size and final location that they are problems. In cats, heartworm disease is more frequently a lung disease and not a vascular disease at all. It is the baby worms that cause all the trouble in feline heartworm disease. If we consider that most feline heartworm disease is from immature worms, the 10% statistic becomes substantially higher.

Heartworm disease in cats can produce an assortment of clinical pictures:

- Coughing, wheezing, difficulty breathing
- Vomiting
- Disease related to embolism or abnormal clots
- Extreme nosebleed
- Neurologic signs may occur, and are likely associated with larvae accidentally migrating to the brain.
- Ten to twenty percent of cats experience sudden death which is probably associated with the death of adult worms.
- Many cats never show noticeable symptoms and approximately 80% clear the infection on their own.

How many cats are infected without symptoms? The answer is not clear because it is the symptomatic cats that get the most medical scrutiny.



Cross section under a microscope of normal cat lung tissue. White areas would be full of air. Thanks to the American Heartworm Society for this picture. Image courtesy of Dr. Ray Dillon and Dr. Byron L. Blagburn, Auburn University College of Veterinary Medicine

## Heartworm-Associated Respiratory Disease, or "HARD"

Also known as *Pulmonary Larval Dirofilariasis*

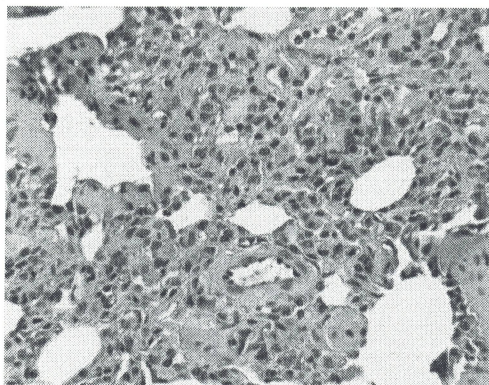
As stated, cats are not a natural host for the heartworm, which means the migrating larval heartworms are not likely to complete their life cycle. To recap from above, baby heartworms called microfilaria are sucked up by the mosquito feeding on an infected dog. The ingested young heartworms must spend enough time (several weeks) in the *mosquito's* body to develop into an infective stage, at which point they are ready to infect a new host. The infective stage heartworm larva is deposited in a drop of mosquito spit adjacent to a mosquito bite, the larvae crawl into the skin puncture made by the mosquito, gain access to their new host, and continue to develop in the soft tissues of the new host, eventually making their way into the circulation and to the host's pulmonary arteries.

The migrating young worm uses molecular signposts to tell it how to get to its host's pulmonary arteries where it wants to finish growing up, mate, and live out its life. The worm is prepared to read CANINE signposts and does not always migrate correctly trying to understand feline protein signals. The worm may get lost and end up who knows where in the body. If the young worms get to the pulmonary arteries at all, most of them are killed by the especially reactive feline immune response against them.

It is this immune reaction that causes heartworm disease in cats and it can start as soon as 75-90 days after the infecting mosquito bite.

When young heartworms die in the pulmonary arteries, the immune system breaks them into fragments and attempts to remove them. The resulting inflammation leads to lung disease which manifests as coughing, respiratory effort, and vomiting. The inflammation associated with the death of fifth-stage heartworm larvae is vastly compounded should a coexisting adult heartworm die. In this situation, yet more inflammation results, and even if the cat survives, all this inflammation creates permanent damage in the delicate lung tissues.

HARD mimics feline asthma and the two diseases look identical on radiographs. Cats with HARD will cough, wheeze (a musical respiratory sign similar to a sigh), and vomit (though it may be hard to tell aggressive productive coughing from vomiting). Breathing may be shallow and rapid and may progress to actual respiratory distress. Heartworm testing is the only way to distinguish these conditions.



Section of a lung from a cat with circulating larval heartworms. The cells of inflammation have thickened the tissues so that oxygen absorption is challenged and there is far less room for air. This is the type of lung change typical of heartworm-associated respiratory disease (HARD). Thanks to the American Heartworm Society for this picture. Images courtesy of Dr. Ray Dillon and Dr. Byron L. Blagburn, Auburn University College of Veterinary Medicine

### Vascular Disease is Separate from HARD

While in most situations feline heartworm disease is a lung disease and not a vascular disease as it is in dogs, sometimes cats do get adult worms in their pulmonary arteries just as dogs do. These adult worms do not live as long as they do in the canine body and they do not achieve the same length/size. If they find a mate and give birth to microfilariae, the microfilariae are promptly killed by the feline immune system within the first month. In short, in the feline pulmonary artery, heartworms are much smaller. You would think this would make for milder vascular disease, but because cats are so small even one adult worm takes up a great deal of space in the vasculature. The more usual lung disease is all the worse if the reaction against the immature worms is complicated by a surviving adult worm in the vasculature. When this parasite finally dies, the subsequent blood clots and inflammation is frequently fatal to cats.

**Most heartworm disease in cats is caused by the inflammatory reaction generated by the worm. In dogs, heartworm disease is mostly about the obstruction of blood flow from the physical size of the worms.**

### Symptoms of Disease

The cat's immune system is extremely reactive against heartworms. For this reason, it is virtually impossible to detect microfilariae in an infected cat (their immune system removes them too quickly). Also, symptoms of infection tend to be more immune-related than heart failure-related. Cats develop more of a lung disease, complete with respiratory distress, and chronic coughing or vomiting. Feline heartworm disease is often misdiagnosed as feline asthma. Sudden death may occur just as it may occur in infected dogs.

In cats, there are two phases where the disease can exert symptoms. The first is when immature worms reach the lung and pulmonary arteries, as early as 75 to 90 days after infection. Even small worms are inflammatory and disruptive to circulation. Cells of inflammation infiltrate the lung and interfere with the cat's ability to breathe. The second phase where problems can occur is when the worm dies. Since cats are not the natural host for this parasite, most immature worms that make it to the lung are killed. The presence of the dead worm is extremely inflammatory. (Imagine your body trying to remove or digest the dead body of another animal inside your lung and circulation!)

The effects of this kind of widespread inflammation may reach far beyond the lung and circulatory system. The kidney can be affected as well as the gastrointestinal tract and even the nervous system.

**Heartworm disease is primarily a lung disease in cats, not a heart disease.**

### Diagnostic Testing

### Antigen Testing

In dogs, diagnosis is usually not complicated. A blood sample is tested for proteins that can only be found on the skin of the adult female heartworm. Most infected dogs have a population of worms in their arteries, so if even one female worm is present an antigen test will show positive. In cats, disease is caused by immature worms, not adult worms female or otherwise, so this kind of testing has limited applications. There may be only a couple of male worms or no adult worms at all to generate a positive antigen test, yet the cat is infected.

### Microfilaria Testing

In dogs, testing for microfilariae (offspring of adult heartworms born in the host's body) are also commonly performed. Unfortunately, in cats, microfilaria testing is virtually worthless. First, infected cats usually do not have enough adult worms for the production of offspring. There may be only a few adult worms; single-sex infection is common. Further, microfilariae, if any, are simply cleared too quickly by the host's immune system and are rarely detected. As mentioned, in cats heartworm disease stems at least in part from migrating immature larvae. No adult worms (and thus no off-spring) are necessary for disease so microfilariae testing is not worthwhile in cats.

### Antibody Testing

Antibody testing may be more sensitive but is not adequate alone. A negative antibody test is good evidence that the cat is not infected; however, a positive antibody test may indicate several things. It could indicate a mature infection with one or more adult worms, immature worms in the body, or a past infection. (Antibody levels will remain somewhat elevated after the heartworms have long since died.)

So if no single test is reliable, what are we supposed to do for testing? First of all, unlike dogs where annual screening is the norm, healthy cat screening is probably not necessary. Instead, testing is best done if a cat is sick and heartworm disease is suspected. There is still some controversy about what testing should be accomplished in a symptomatic cat. Both antibody and antigen tests in combination are recommended by some experts, while others feel the antibody test alone is probably adequate. Of course, a cat with respiratory disease probably should have chest radiographs and cardiac echocardiography to further define the condition at hand.

### Treatment

Since the major signs of disease in the cat are due to inflammation and immune stimulation, a medication such as prednisolone can be used to control symptoms. A bacteria called *Wolbachia* commonly live within the heartworm and enhances its ability to generate inflammation. A course of doxycycline is often recommended to address these bacteria. The doxycycline course is short but the prednisolone will most likely be a several-week course that may be repeated.

If the cat does not appear sick, the American Heartworm Society recommends attempting to wait out the adult worm's 2-3 year lifespan and simply monitor chest radiographs every 6 months or so. The median survival time is 1.5 years for heartworm infection in cats. Radiographs are monitored to check progress.

One might wonder why we cannot use the same treatment as we do for dogs to kill any adult heartworms a cat might have. Actually, the same heartworm adulticide therapy used in dogs is best not used in cats as it is extremely dangerous to do so and is considered a last resort. There may not be a choice, however, depending on the degree of illness from the heartworm disease. Approximately one-third of cats receiving heartworm adulticide therapy will experience life-threatening embolic complications when the worms die suddenly (generally an unacceptable statistic). One month of cage confinement is typically recommended to control circulatory effort after adulticide treatment and adulticide therapy should be considered the last resort for an infected cat where symptoms of the disease cannot be controlled with prednisone.

### Prevention

In studies of infected cats, 25% of infected cats were considered **indoor-only cats**. Because of this and the disastrous effect of even one heartworm to a cat, the American Heartworm Society recommends monthly prevention for **all cats** living in heartworm-endemic areas. Read their [feline guidelines](#).

The good news is that feline heartworm infection is preventable and there are currently four medications on the market that are reliably effective.

#### Ivermectin

The dose of ivermectin (the active ingredient of Heartgard) needed to prevent heartworm infection in cats is about four times higher than in dogs. Heartgard was the first FDA-approved heartworm prevention medication available for cats. It is a monthly flavored chewable available by prescription.

#### Milbemycin Oxime

Interceptor® also makes a monthly chewable for cats with the same active ingredient (milbemycin oxime) as Interceptor for dogs. Interceptor for cats also protects against hookworms and roundworms. Milbemax is similar but adds praziquantel for regular tapeworm removal.

#### Selamectin

Revolution® entered the anti-parasite scene in 1999. This product covers fleas, roundworms, hookworms, and ear mites in addition to preventing heartworm in cats. Revolution Plus is a more recent update with enhanced flea and tick control. Either form of Revolution is an effective heartworm preventive. These products are applied topically rather than orally.







#### Moxidectin



**Advantage Multi®** combines imidacloprid for flea control and moxidectin for heartworm prevention in one product. This product is also applied topically. It covers roundworms, hookworms, and [ear mites](#) as well as heartworm. Similarly, **Bravecto Plus®** combines fluralaner for fleas and ticks with moxidectin for worm prevention. This product also covers the same parasites as Advantage Multi plus ticks.

For more information, see the [American Heartworm Society](#).

#### Related resources

- [Heartworm: The Parasite - April 4, 2024](#) 
- [Heartworm Treatment for Dogs - November 29, 2023](#) 
- [Heartworm Disease in Dogs: You are being redirected to updated information on this topic - August 17, 2023](#) 
- [Heartworm Diagnosis in Dogs and Cats - July 13, 2023](#) 
- [Heartworm Preventive Comparison Chart for Dogs and Cats - April 11, 2023](#) 
- [Preventing Heartworm Infection in Dogs - August 7, 2019](#) 

URL: <https://veterinarypartner.vin.com/doc/?id=4951471&pid=192396f9c07fa-7d64-4c83-8c0c-b2da4752aea71736204619>

The content of this site is owned by Veterinary Information Network (VIN®), and its reproduction and distribution may only be done with VIN®'s express permission.

The information contained here is for general purposes only and is not a substitute for advice from your veterinarian. Any reliance you place on such information is strictly at your own risk.

Links to non-VIN websites do not imply a recommendation or endorsement by VIN® of the views or content contained within those sites.



## Upper Respiratory Infection in Cats

Wendy Brooks, DVM, DABVP

Revised: July 03, 2024

Published: January 01, 2001

[See article summary below.](#)

### Signs

- Sneezing
- Nasal discharge
- Runny eyes
- Cough
- Oral or nasal ulcers
- Sniffles
- Fever
- Hoarse voice
- Or any combination thereof

### What Cats Are at Risk?

The agents of feline upper respiratory infection are highly contagious and present wherever cats live in groups. Getting infected is easy; a cat simply must socialize with an infected cat or share the same human caretaker, toys, or food bowls. It would seem that the average house cat would be at low risk for infection; however, it is important to realize how common upper respiratory infection is. In some areas, the infection rate is felt to be 60% or more. This means that there is an excellent chance that any cat or kitten is already infected at the time of adoption, regardless of whether the cat is showing any symptoms. *Kittens are predisposed* due to their immature immune systems and are usually hit the hardest. When these kittens grow up, they are still infected, and symptoms may come out whenever stress suppresses their immune system.

Typically, infected cats come from the *shelter*, are *outdoor cats*, or are housed in close contact with lots of other cats (*experiencing crowding stress*). *Persian cats* are predisposed to upper respiratory infection due to their inherent facial flattening. The average house cat who is not exposed to any rescued kittens lives with only one or two other cats at most, never goes outside, and leads a non-stressed life is unlikely to break with symptoms but may very well be asymptotically infected.



Severe nasal discharge can occur with upper respiratory infections in cats.

**The chief infectious agents that cause feline upper respiratory infections are *herpesvirus* and *calicivirus*, together accounting for about 90 percent of infections. Other agents include: *Chlamydomphila*, *Mycoplasma*, *Bordetella*, and others. Of course, a cat or kitten may be infected with more than one agent.**

Viruses are spread by the wet sneezes of infected or carrier individuals. The herpesvirus is fragile, surviving only 18 hours outside its host; calicivirus is tougher, lasting up to 30 days. Bleach will readily inactivate either virus but calicivirus is able to withstand unbleached laundry detergents.

**A cat with herpes is contagious to other cats for a couple of weeks after a stressful event. Cats infected with calici are contagious for several months after infection but do not appear to have recurrences the same way cats with herpes do.**

### Course of Infection

To some extent, the combinations of symptoms and course of infection is determined by which of numerous infectious agents is responsible. Ninety percent of feline upper respiratory infections are caused by either feline herpes (also called the rhinotracheitis virus) or feline calicivirus. Neither of these infections is transmissible to humans or to other animals.

Most feline colds run a course of 7 to 10 days regardless of treatment but it is important to realize that these infections are permanent and that herpesvirus infections are recurring (a property of all types of herpes infections). In kittens, herpes infections are notorious for dragging out. Stresses such as surgery (usually neutering/spaying), boarding, or introduction of a new feline

companion commonly induce a fresh herpes upper respiratory episode about a week following the stressful event and the active virus sheds for another couple of weeks. These episodes may recur for the life of the cat, although as the cat matures, symptoms become less and less severe and ultimately may not be noticeable to the owner. Cats infected with calicivirus may shed virus continuously, not just in times of stress, and may do so for life, although about 50% of infected cats seem to stop shedding virus at some point.

A cat with herpes is contagious to other cats for a couple of weeks after a stressful event. Cats infected with calicivirus are contagious for several months after infection but do not appear to have recurrences the same way cats with herpes do.

The next most common infectious agents (after herpes and calici) are *Chlamydomphila felis* (formerly known as *Chlamydia psittaci*) and *Bordetella bronchiseptica*, both organisms being sensitive to the tetracycline family, such as doxycycline.

#### When to be Concerned: Signs a Cat Requires Hospitalization

- Loss of appetite
- Congestion with open-mouth breathing
- High fever (or the extreme listlessness that implies a high fever if you cannot take the cat's temperature).

A cold for a cat is usually just a nuisance like a cold usually is for humans. Sometimes, though, an upper respiratory infection can be serious. If a cat is sick enough to stop eating or drinking, hospitalization may be needed to get through the brunt of the infection. A cat (usually a kitten) can actually get dehydrated from the fluid lost in nasal discharge. Painful ulcers can form on the eyes, nose or in the mouth, especially if calicivirus is involved. Sometimes fever is high enough to warrant monitoring. In young kittens, pneumonia may result from what started as an upper respiratory infection. There is also a shifting leg lameness (called "limping kitten syndrome") associated with Calici infection.

If you think your cat or kitten is significantly uncomfortable with a cold, you should seek veterinary assistance with an office visit.

#### How is this Usually Treated?

How an upper respiratory infection is treated depends on how severe it is and whether or not there seems to be a bacterial infection complicating the viral infection. A mildly symptomatic adult cat might need no treatment at all, as the symptoms should naturally wane over one to two weeks. A heavily congested kitten will likely need antibiotics, antivirals, and possibly even hospitalization. Oral medications and/or eye ointments are commonly prescribed. Severely affected cats may need to have inhalational antibiotics, fluids administered intravenously or under the skin to maintain hydration, and/or some sort of assisted feeding.

#### Special Therapies

Some cats are severely affected, and addressing the secondary bacterial infection is simply not enough to achieve comfort. For these situations, antiviral medications such as famciclovir can be used to address the viral infection, and often, even chronic symptoms can be controlled at least temporarily.

Cats are too small to meaningfully blow their noses or sneeze out very dry or thick sinus secretions. Oral supplementation with N-Acetylcysteine can be helpful in breaking down this material.

Polyprenyl immunostimulant is a biological product made by Vetimmune® currently licensed by the USDA to treat feline herpes infection. This product is given orally once a day for two weeks and reportedly stimulates cellular immunity (as opposed to antibody-related immunity).

More chronically infected cats with severely blocked sinuses can have their sinuses flushed out under anesthesia. This can clear a great deal of material out of the nasal passages but how long results persist is variable.

Consult your veterinarian before attempting any sort of home treatment.

#### What are the Vaccination Options?

Vaccination is unlikely to be completely preventive for upper respiratory viruses and is instead meant to minimize the severity of the symptoms. In selecting a vaccine against upper respiratory infections, there are some choices. First, choose between a nasal vaccine and an injectable vaccine.



Injectable vaccine syringe - Graphic by MarVistaVet

The injectable vaccines that typically include feline distemper were developed first, and when vaccines for upper respiratory infections were created they were simply added to the basic distemper injectable vaccine. Since that time, science has developed a more localized form of vaccination to better address more localized types of infections.

If you select the injectable route of vaccination, you have to decide if you want a "four in one" or a "three in one" vaccine. You may vaccinate your cat for distemper, herpesvirus, and calicivirus, or you may vaccinate for distemper, herpesvirus, calicivirus, and *Chlamydomphila felis*. Because herpes and calicivirus together account for 90% of upper respiratory infections and *Chlamydomphila* accounts for less than 10% of upper respiratory infections, the American Association of Feline Practitioner vaccination guidelines favor the "three in one" vaccine and consider the *Chlamydomphila* vaccine optional.

There is some feeling that nasal vaccines may provide a more complete stimulation to the area of the immune system responsible for defense against the infection in question. Nasal vaccination provides protection especially rapidly (3 or 4 days). Herpes and calicivirus vaccines can be given either nasally or by injection.

#### A Few Words about Hemorrhagic Calicivirus

A particularly virulent strain of calicivirus, commonly referred to as hemorrhagic calicivirus, has appeared to pop up out of nowhere. While few outbreaks have been reported, it is possible more have occurred and gone unrecognized. Hemorrhagic calicivirus is highly contagious and rapidly fatal. While the infection is rare, you may wish to vaccinate your cat for it and/or discuss this option with your veterinarian.

A special vaccine, called "TruFel HC2PCh," has become available from Elanco.

#### In Summary:

- When caused by herpes virus or calici, the viruses from these infections can become dormant and hide out in the body, but can reactivate, usually in response to stress. Some other causes of URIs do not make the cat a carrier, but they are less common.
- Signs: sneezing, nasal discharge, runny eyes, cough, sniffles, fever, mouth or nose ulcers
- The chief infectious agents for URIs are [herpesvirus](#) and calicivirus, which together are responsible for about 90% of infections. Those two agents cannot spread to people.
- Bleach will inactivate either virus.
- They are spread to other cats by the sneezes - or contact with any respiratory secretion - of infected or carrier cats.
- To become infected, a cat just has to socialize with an infected cat or share the same toys, food bowls, or human caretaker (through clothing and dirty hands).
- Infected cats typically come from the shelter, are outdoor cats, or are housed in close contact with lots of other cats.
- Because it is so common, it is likely that any feline adopted from a shelter has it.
- Kittens are predisposed because their immune systems are immature, and they are usually hit the hardest. When they grow up, they are still infected, and signs may come out whenever stress suppresses their immune system.
- Stresses such as surgery, boarding, or a new feline companion commonly induce a relapsing herpes upper respiratory episode.
- A cat with herpes is contagious to other cats for a couple of weeks after a stressful event throughout the cat's life.
- Treatment depends on how mild (just sneezes) or severe (hospitalization) it is, and if a bacterial infection complicates the viral infection.
- A cat may need hospitalization if their appetite is lost, breathes with an open mouth, and has a high fever/listlessness.
- A heavily congested kitten is likely to need antibiotics and antivirals.
- Vaccination is unlikely to be completely preventive for an URI and will simply minimize the severity of signs but that can potentially mean the difference between being hospitalized and staying home.
- A nasal or injectable vaccine is available.
- Virulent calicivirus (or FCV-associated virulent systemic disease) is rare but can occur, typically in stressed populations, and can cause severe disease. [Back to top](#)

URL: <https://veterinarypartner.vin.com/doc/?id=4951489&pid=192396f9c07fa-7d64-4c83-8c0c-b2da4752aea71736204870>

The content of this site is owned by Veterinary Information Network (VIN®), and its reproduction and distribution may only be done with VIN®'s express permission.

The information contained here is for general purposes only and is not a substitute for advice from your veterinarian. Any reliance you place on such information is strictly at your own risk.

Links to non-VIN websites do not imply a recommendation or endorsement by VIN® of the views or content contained within those sites.



## Neutering Your Male Cat

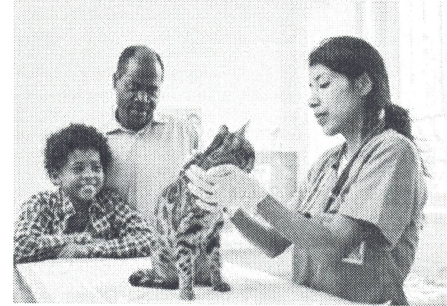
Wendy Brooks, DVM, DABVP

Revised: November 25, 2024

Published: January 01, 2001

Neutering a male cat is an excellent step to help your young cat grow into a loving, well-adapted family member. The main reason to neuter a male cat is to reduce the incidence of objectionable behaviors that are normal in the feline world but unacceptable in ours. A neutered male cat has had his testicles removed, not only ending his ability to reproduce but also removing his source of testosterone and his interest in hormone-driven behaviors.

- **Roaming:** More than 90 percent will reduce this behavior with neutering. Approximately 60 percent reduce this behavior right away.
- **Fighting:** More than 90 percent will reduce this behavior with neutering. Approximately 60 percent will reduce this behavior right away.
- **Urine marking:** More than 90 percent will reduce this behavior with neutering. Approximately 80 percent reduce this behavior right away.



Talk with your veterinarian about what to expect with your cat's neuter.

Other benefits of neutering include a drastic reduction in cat urine odor, reduced incidence of feline asthma, and of gingivitis (gum inflammation). The reduction in fighting and roaming helps an outdoor male cat reduce his risk of FIV infection, bite wounds and associated abscesses, automobile-related trauma, dog/coyote-related injury, and other outdoor lifestyle situations that result from traveling away from home.

Cosmetic reasons to neuter a male cat have to do with the physical appearance. The mature tomcat is built for battle with a muscular body and facial thickenings (called shields) for protection against the bites of his combat opponents. Tomcats neutered after puberty will eventually lose these characteristics, and male cats neutered before puberty will never develop them.

A common shelter practice has been to adopt a young male kitten with his new owner paying a neuter deposit, which is then refunded when the kitten is neutered at the traditional age of six months. The problem has been that new owners do not return and young cats go unneutered. Given that studies have found that approximately 70 percent of feline litters are unplanned and there is presently an enormous feline overpopulation problem, the importance of neutering cannot be overemphasized.

### What is Early Neutering?

Early neutering allows for kittens to be neutered prior to adoption thus preventing these kittens from contributing to the unplanned litter problem. There has been some controversy over this practice as it flies in the face of tradition and there have been questions about any negative health consequences of this practice.

### Some concerns that have been explored include:

- *Behavioral problems, shyness, or socialization issues in kittens neutered early.*
  - Early neutered kittens share the behavioral benefits listed above, but temperament problems have not been documented.
- *Kittens neutered early may be stunted or small.*
  - Actually, early neutering delays the closure of the bone growth plates, making for a slightly taller cat.
- *Early neutered kittens will have a narrowed urethra predisposing them to urinary blockage.*
  - This has not borne out, either. Urethral dimensions in male cats do not vary based on the age of neutering.

### Growth Plate Concerns

- *Early neuter predisposes to capital physis fracture (a break in the growth plate of the femur, the long bone of the hind legs) or slipping.*

Physis is the medical term for a bone growth plate; that plate is the area on an immature bone where the bone is actively growing in length. The bone in this area is softer, and the two pieces can slip apart, creating a problem for the growing bone. The "capital physis" is the growth plate of the head of the femur (one of the hip bones). If it slips, then surgery (a femoral head and neck ostectomy) is needed to restore function.

Early neutering is one of several factors correlated to slipping a capital physis, the other risk factors are being male, and being overweight. The problem seems to be a combination of being overweight and having delayed closure of the growth plates (as occurs with neuter before age six months). This injury is not common among early neutered kittens, but early neutered kittens are overrepresented among cats with this injury.

A study from Cornell University that followed 1600 cats for 11 years found no diseases, injuries, or other issues common in kittens neutered between 3.5 months and six months versus those neutered after age six months.

Ask your veterinarian about early neutering. Your veterinarian may prefer that kittens weigh at least 3 pounds so that the tissues are not too difficult to manipulate.

### The Feline Neuter Surgery

The feline neuter is one of the simplest surgical procedures in all veterinary medicine. The cat fasts overnight so that anesthesia is given on an empty stomach. The scrotum is opened with a small incision and the testicles are brought out. The cords are either pulled free and tied to each other or a small suture is used to tie the cords and the testicle is cut free. The skin incision on the scrotum is small enough that external stitches are not usually required.

### Recovery

There is minimal recovery with this procedure with some clinics discharging kittens on the same day as surgery. There should be no bleeding or swelling. No bathing is recommended until the incisions have healed for 10 to 14 days from the time of surgery. Always check with your veterinarian if you have any recovery questions post-surgery.

URL: <https://veterinarypartner.vin.com/doc/?id=4951443&pid=192396f9c07fa-7d64-4c83-8c0c-b2da4752aea71736204312>

The content of this site is owned by Veterinary Information Network (VIN®), and its reproduction and distribution may only be done with VIN®'s express permission.

The information contained here is for general purposes only and is not a substitute for advice from your veterinarian. Any reliance you place on such information is strictly at your own risk.

Links to non-VIN websites do not imply a recommendation or endorsement by VIN® of the views or content contained within those sites.





## Spaying your Female Cat

Wendy Brooks, DVM, DABVP

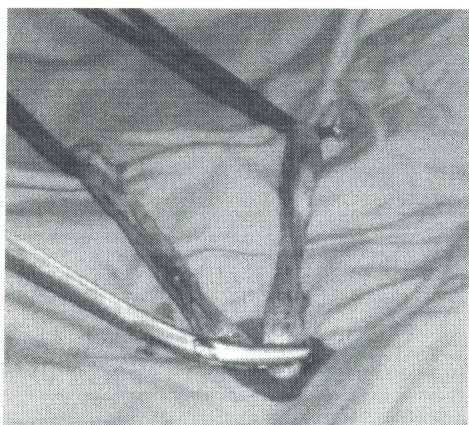
Revised: August 09, 2023

Published: January 01, 2001

Spaying your cat is an important part of basic cat health care. Spaying at a young age prevents mammary cancer, and spaying at any age prevents unwanted kittens, noisy heat cycles, and possibly even urine marking in the house. The following is a list of frequently asked questions gleaned from years of veterinary practice as well as from answering questions online. We have found that, even though a cat spay is a routine and commonly performed procedure, many pet owners still have questions.

**What is actually removed during spaying?**

Spaying is an ovariectomy, which means that both the ovaries and the uterus are removed. The cervix is tied off, leaving the vagina to end in a blind sac. Since it is the ovaries that are responsible for the heat cycles, possible mammary tumor development, and behavior problems, it is crucial that the ovaries be removed intact. Some veterinarians will leave the uterus behind, though it is standard to remove the entire tract, uterus included.



Feline reproductive tract after removal. Note the uterus as two horns forming a Y shape. The ovaries are located at the end of the arms of the Y. The cervix is at the base of the Y. Image Courtesy of Marvistavet.com.

**How long will my cat stay in the hospital?**

Some hospitals prefer to keep surgery cases overnight so that they can rest in a properly confined area; some veterinarians believe that this first night of confinement helps the incision in healing. Some hospitals and most spay clinics will release the cat on the same day as surgery so that she may be observed at home in case of problems. Either way is legitimate and largely depends on the preference and philosophy of the doctor in charge of setting policy.

**Will she have stitches?**

Some veterinarians always place an external closure of the skin in the form of either stitches or staples. Some veterinarians never place skin stitches and prefer to close the incision with buried sutures that are internal. The spay incision is closed in several layers (the abdominal muscles, the tissue under the skin, and the skin itself may all be closed separately). Skin stitches necessitate a return visit for a recheck, which is always a good idea after abdominal

surgery. Obviously, it may be more convenient for the owner not to have to make a return trip, and it may be simpler not to have to worry about the cat pulling out her skin stitches and causing herself injury. Some hospitals employ both methods, though aggressive or feral cats almost always receive buried sutures so as to eliminate possible bite injury to the staff at suture removal.

**What can I expect regarding the recovery period/incision care?**

One of the advantages of keeping cats overnight after spaying is that they usually go home bright and alert as if nothing has happened. Some cats will not eat for the first day or so, but if the cat does not seem back to normal by the day following discharge, your veterinarian would like to know about it.

Cats discharged on the same day as surgery may experience more soreness if not confined to a small area. Food and water are generally withheld until the next day or late that night, and the cat should be kept quiet and not allowed outside. Cats should not be discharged while still groggy in any way from anesthesia as they are a danger to themselves and to their human handlers. Additional pain medication may be prescribed.

Later in the recovery period, it is not unusual to notice swelling at the incision site. Cats often react this way to internal sutures, and this kind of swelling is common and resolves spontaneously. Such swellings are firm, and there is no fluid drainage or bleeding from the incision. They generally resolve in 3 to 4 weeks and represent a reaction to the internal sutures as they



Dr. Brooks performs surgery. Image Courtesy of Marvistavet.com

dissolve. That said, it is prudent for any incisional swelling to be checked out. If the cat has been overly active, she can break internal stitches, which could be a problem.

Any fluid drainage from the incision is abnormal, and the cat should be rechecked by the veterinarian who performed the spay if possible.

What if she is in heat at the time of spay?

Some female cats are disruptively annoying when they are in heat, yowling and carrying on and they are spayed to end the heat quickly. Other cats are spayed in heat randomly when the owner does not realize that the cat is in heat. Either way the spay is slightly more difficult due to the engorgement of the tissues and larger blood vessels. Spaying during heat does not carry a significant risk to the cat, but since extra surgery time is frequently required, an extra charge may be incurred.

Occasionally spaying a cat in heat leads to dramatic mammary gland development in the recovery period because the sudden drop in progesterone levels that accompanies removing the active ovaries mimics the drop in progesterone that accompanies giving birth to kittens. The subsequent mammary development (called mammary hyperplasia) can be spectacular but generally resolves without treatment as hormones normalize.

What if she is pregnant at the time of spay?

Spaying can be performed at any time during the course of pregnancy. Often, the owner is unaware that the cat is pregnant. If there is any question, make it clear to your veterinarian what your wishes are should your cat be found pregnant. The incision can be closed, and the pregnancy can proceed, or the spay can proceed, and the developing kittens will be removed along with the rest of the uterus. Due to extra work and surgery time, most veterinarians will charge an extra fee for spaying a pregnant animal. Some veterinarians will not knowingly spay a pregnant animal after a certain stage of pregnancy. At my hospital, I am commonly asked what to do about newly adopted stray cats thought to be pregnant. As we work with numerous rescue groups, we are keenly aware of the pet overpopulation problem. We encourage the spaying of strays or newly adopted female cats regardless of pregnancy. There are simply too many kittens without homes as it is.

Will spaying affect her personality?

The female cat spends at least half the year with her reproductive tract dormant (cats only cycle seasonally, primarily in the spring and summer). This means that behaviorally speaking, she acts spayed most of the time, and no personality change should be noted. This said it is important to realize that a cycling cat can be extremely solicitous of affection. This kind of playful, flirtatious behavior will stop with spaying.

How long after having kittens can she be spayed?

The mammary (breast) development that comes with nursing can make the spay surgery more difficult. Ideally, a month after weaning allows for regression of this tissue, and spaying can proceed. Unfortunately, it is possible for a female cat to become pregnant during this waiting period if her owner is not careful.

At what age can my cat be spayed?

The traditional age for spaying is six months; however, this practice has enabled kittens to be adopted from shelters unspayed. Often the new owner fails to return for spaying, and the result is a further contribution to the pet overpopulation problem. (Up to 70% of litters from owned cats are unplanned.)

The last 20 years have brought us a great deal of research into and experience with early spaying, and there are many advantages of spaying well before the age six months. Young kittens recover more quickly from spaying than older kittens, and kittens spayed at young ages seem to have a reduced incidence of asthma later on. Obviously, accidental pregnancy is not an issue when the kitten is adopted and already spayed. Spaying can be performed in kittens as early as eight weeks; however, my hospital finds such tiny tissues difficult to manipulate, and I like to wait to spay our female patients until they weigh at least three-and-one-half to four pounds.

Will she get fat and lazy after spaying?

Estrogens have a natural appetite-suppressing effect, and the loss of estrogens may lead to an increased appetite. Further, sterilization surgery has been shown to slow a cat's metabolism. Depending on the cat's age and activity level at the time of surgery, a diet change to a "light" diet may be in order. Ask your vet if you are not sure.

Without ovaries, she should be unable to come into heat. That said, feline ovarian tissue has been documented extending down the ovarian ligament, well outside the actual ovary but not visible to the naked eye. This allows for ovarian tissue sometimes to be retained even when the ovary has been removed intact. Occasionally, a remnant of ovarian tissue is simply left behind by accident. This can lead to some annoying behaviors as the cat comes into heat (though she would be unable to get pregnant if her uterus had been removed, as is customary with spaying). Some testing or even surgical exploration may be needed to determine if there is an ovarian remnant.

Once again, spaying is an important part of cat ownership and one of the most significant steps in health care that a cat owner can provide for their female cat.



Spay incision with stitches "buried" under the skin.  
Image Courtesy Marvistavet.com



URL: <https://veterinarypartner.vin.com/doc/?id=4951480&pid=192396f9c07fa-7d64-4c83-8c0c-b2da4752aea71736204354>

The content of this site is owned by Veterinary Information Network (VIN<sup>®</sup>), and its reproduction and distribution may only be done with VIN<sup>®</sup>'s express permission.

The information contained here is for general purposes only and is not a substitute for advice from your veterinarian. Any reliance you place on such information is strictly at your own risk.

Links to non-VIN websites do not imply a recommendation or endorsement by VIN<sup>®</sup> of the views or content contained within those sites.

By VIN