THE CORNELL FELINE HEALTH CENTER • CORNELL COLLEGE OF VETERINARY MEDICINE

# Cat Watch

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*Expert information on medicine, behavior, and health in collaboration with a world leader in veterinary medicine*

THIS JUST IN

## Ranitidine (Zantac) Recalled by FDA

### *It contains a carcinogen that can build up over time*

On April 1, the Food and Drug Administration (FDA) requested that all ranitidine (brand name Zantac) products be removed from the market due to contamination with N-nitrosodimethylamine (NDMA), a probable human carcinogen. They believe "the impurity in some ranitidine products increases over time and when stored at higher than room temperatures and may result in consumer exposure to unacceptable levels" of NDMA. NDMA is present in water and foods and is not harmful at low levels, but higher levels may cause cancer. Not all ranitidine products have been found to contain NDMA, or even dangerous levels of it, but it has been found that levels increase over time.

Ranitidine is a histamine H2 receptor antagonist and works to reduce the production of stomach acid. It has been used off-label in cats to treat and prevent ulcers in the stomach and small intestines. If your cat is currently receiving ranitidine, you should ask your veterinarian about alternative medications to manage his condition.■

**INSIDE THIS ISSUE**



## Measuring Pain in Cats

### *Feline activity monitors may become pain detectors*

We have always known that a cat in pain is less active, especially if she is battling orthopedic issues. It can be difficult, though, to detect a cat's initial subtle increase in pain or to tell if the pain is worsening. A new study shows that an activity monitor has the potential to objectively monitor chronic pain.

A study published in the *American Journal of Veterinary Research* looked at the jumping behavior for 13 normal cats, ages 2 to 13 years with body-condition scores of 5 to 8 (on a scale of 1 to 9). None of the cats had known orthopedic problems. Each cat wore a 1.3-cm-wide collar set to record raw data positioned under the neck. The researchers characterized jumping activity by the cats during a period of five to eight hours, two to four hours of which included human intervention (a veterinary technician encouraging cat activity using toys and treats).

In addition to the collar monitors, the cats were videoed so that a comparison could be made between what the monitors registered and what activity was seen.

Of 731 recorded jumping events (median average was 43 jumps per cat), 29 jumps were misclassified for reasons such as the data collar shifting position. Overall, the mean misclassification error rate per cat was 5.4%, indicating a correct classification rate per cat of 94.6%.

The researchers concluded that the evaluation of jumping behaviors could be used to monitor cats for pain and to assess treatment analgesic efficacy. These monitors may become useful to aid in early detection of osteoarthritis and other underlying causes of joint pain in cats.■

*https://doi.org/10.2460/ajvr.81.4.334*

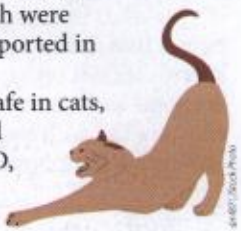
## MOPP Chemotherapy Is a Viable Alternative

### *Study shows 70% of cats achieved remission*

Lymphoma accounts for 30% of all forms of neoplasia in cats. Most feline lymphoma cases are characterized as medium to high grade, and multi-agent chemotherapeutic protocols constitute the mainstay of treatment. Response rates for the most commonly utilized chemotherapeutic protocols for medium- to high-grade feline lymphoma (cyclophosphamide, vincristine, prednisolone {COP}, +/- doxorubicin {CHOP}) vary between 38 and 96%, but reinduction of durable remission following relapse remains a challenging clinical syndrome to manage.

A recent multi-center retrospective study evaluated the safety and efficacy of the mustargen, vincristine, procarbazine, prednisolone (MOPP) chemotherapeutic protocol for the treatment of relapsed or refractory feline lymphoma. Of the 37 subjects in this cohort, 26 achieved remission (approximately 70%), with a median duration of remission after MOPP rescue of 166 days. The most common side effects included gastrointestinal upset and neutropenia, which were reported in approximately 18% of cats. No adverse effects were reported in approximately 55% of cases.

"The results of this study suggest that the MOPP protocol is safe in cats, and that it shows promise as a therapeutic alternative for relapsed or refractory feline lymphoma," says Bruce Kornreich, DVM, PhD, DACVIM, Director of the Feline Health Center.■



*J Feline Med Surg. 2020 Apr;22(4):299-304. doi: 10.1177/1098612X19841916.*

# Two Antibiotics That Are Not Ideal for UTIs

## *Amoxicillin and amoxicillin-clavulanate were no help*

A study in the January 2020 *Journal of Veterinary Internal Medicine* retrospectively evaluated urinary tract infections (UTIs) and urine culture and susceptibility results for cats and dogs in the Midwest to look for trends. Of the 143 cats included in the study, none of the bacteria grown in their urine cultures were susceptible to amoxicillin or amoxicillin-clavulanate.

What does this mean for owners and veterinarians? These two antibiotics are likely not the best choice for treating UTIs in cats. There may be regional differences, however, as this study only used cats from the midwestern United States. In addition, with other antibiotic options available, other antibiotics may be started while waiting for urine culture and susceptibility results.■

*KuKanich K, Lubbers B, Salgado B. Amoxicillin and amoxicillin-clavulanate resistance in urinary Escherichia coli antibiograms of cats and dogs from the midwestern United States. J Vet Intern Med. 2020;34:227–231.*

# Epidurals for Urethral Obstruction Pain

## *They reduce anesthesia required and help with pain control*

A study published in the February 2020 *Journal of Veterinary Emergency and Critical Care* (San Antonio) evaluated the use of a caudal epidural to assist with placing a urinary catheter in 88 male cats with urethral obstruction. The goal was to determine the efficacy and safety of the technique.

The cats were randomly assigned to groups for the study: 30 received a bupivacaine epidural, 28 a morphine-bupivacaine epidural, and 30 a sham epidural. There was a 70% success rate in performing the epidurals, and no cats had complications resulting from the epidural. The cats in the test groups required significantly less anesthetic drug (propofol was used for this study) to allow placement of a urinary catheter than the sham group and remained comfortable for longer periods of time before needing additional pain medication. The researchers concluded, "Caudal epidural appears to be safe, may reduce the amount of IV anesthesia needed to facilitate urinary catheterization, and can be used to provide long-term analgesia in the hospital."■

*Pratt CL, Balakrishnan A, et al. A prospective randomized, double-blinded clinical study evaluating the efficacy and safety of bupivacaine versus morphine-bupivacaine in caudal epidurals in cats with urethral obstruction. J Vet Emerg Crit Care (San Antonio). 2020 Feb 26.*

# Stress as a Cause of Excessive Grooming

## *A presumptive diagnosis once medical reasons are ruled out*

Kitties are known to be fastidious groomers but be careful not to confuse psychogenic alopecia (hair loss) with normal feline grooming. Psychogenic alopecia (PA) is characterized by excessive grooming and may result in damage to the skin, with secondary bacterial infection that can require therapy. The cause of PA is unknown, but it is possible that grooming releases endorphins that may calm cats that are stressed for a variety of reasons.

If a cat is observed to be grooming excessively, the first step is to rule out medical causes, including itching induced by allergies/fleas and/or pain secondary to arthritis or some other condition. Once a medical cause has been ruled out and a presumptive diagnosis of PA is made, minimizing stress is extremely important.

Making sure that no conflict exists between pets in the house, that feeding and sleep schedules are regular, and that specific time is set aside for play/attention by the owner are good ways to minimize stress. In some extreme cases, consultation with a veterinary behaviorist and/or anti-anxiety medications may be helpful.■

SIGNS OF FEAR
excessive grooming

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CatWatch

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# Living Life on a Tilt-a-Whirl

## *Cats with cerebellar hypoplasia can live long lives*

You took in a pregnant stray cat and have been fostering her and her kittens. The kittens are a few weeks old now and starting to walk, but one of them struggles, stumbles, and falls a lot. What is going on?

### Damaged Cerebellum

The kitten in this scenario likely has cerebellar hypoplasia, or an underdeveloped cerebellum. The cerebellum is the part of the brain responsible for balance, coordination, and fine motor skills, and becomes fully developed a few weeks after the kitten is born. Any damage during this critical period can result in permanent deficits.

In most cases, that damage is in response to panleukopenia, sometimes referred to as feline distemper. If a kitten is exposed to this virus while in utero or after being born, the virus attacks the rapidly dividing cells of the cerebellum and destroys the growing nerves. The extent of the damage depends on the age of the kitten and the developmental stage of the brain.

Entire litters can be affected, or it may just be one or two kittens. Some kittens may have more severe signs than others.

Other less common causes include head trauma, malnourishment while in utero, and toxoplasmosis infection.

Because cerebellar hypoplasia is a developmental disorder, there is no treatment or cure.

### Common Signs

Kittens with cerebellar hypoplasia are abnormal right from birth, but their balance deficits are often not noticed until the kitten is 4 or 5 weeks old and littermates are becoming more skilled at walking and playing. These kittens are clumsy, tending to wobble and weave when walking, and may fall over frequently. Their movements are jerky, with high-stepping strides and a tendency to sway. The kitten may keep her feet in a wide stance for better balance. Some learn to lean on walls for added stability when on the move.

When stationary and at rest, these cats look normal. Some will have "intention tremors," and start to twitch and wobble when they decide on an action and start to pursue it. This can include anything from walking and running to leaning over to eat.

The cat will likely become more proficient at navigating her environment as she masters her body and where everything is located, but she will never move normally. Some cats have only mild signs, while others may be more severe. It is a non-progressive condition, so the cat will not worsen over time.

There is no test for cerebellar hypoplasia. In some cases, magnetic resonance imagery (MRI) may show that the cerebellum is smaller than normal, but a diagnosis is usually made by watching the kitten move and evaluating risk for panleukopenia exposure during development. If a kitten has had a known traumatic head injury, the veterinarian will take that into consideration as well.

### Vaccination

You may have recognized panleukopenia as one of the diseases covered in your cat's routine vaccinations—this is the "P" in FVRCP and RCP, and the disease colloquially referred to as "feline distemper" (see "Feline Panleukopenia," May 2020, available at catwatchnewsletter.com). If a queen has been kept up to date on this vaccine, she will have antibodies to panleukopenia that protect her and that she can pass on to her kittens so they are protected both before and after birth (then once the kittens are old enough that their maternal immunity is starting to wear off, they can receive vaccines to stimulate the production of their own antibodies). Kittens born to vaccinated mothers are usually safe from cerebellar hypoplasia.

If a pregnant queen either has not been vaccinated or has an unknown vaccination history, a veterinarian should be consulted to evaluate her case. The modified live version of the panleukopenia vaccine should never be given to pregnant queens or to kittens under 4 weeks old, as these individuals have a compromised immune system and may develop the disease in response to this vaccine. The American Association of Feline Practitioners recommends that the inactivated version of the vaccine be given if it is necessary to vaccinate a pregnant queen. In most cases, a wait-and-see approach is chosen, and the mother and kittens can be vaccinated when the kittens are old enough.

*Clumsy, wobbly kitties need you to manipulate their environment to help keep them safe.*

### Living with Cerebellar Hypoplasia

Cerebellar hypoplasia is not painful, and it is not contagious. For affected cats and kittens, living life on a tilt-a-whirl is normal. Kittens with cerebellar hypoplasia will go through the same growth and learning stages as normal kittens, experimenting first with walking and then with running, jumping, climbing, and play-fighting. They will just be clumsier!

Use food and water bowls with wide bases that are difficult to spill, as these cats will bump into the bowls. Raised bowls may make eating and drinking easier for some cats and can make it easier to prevent spills. A cat with cerebellar hypoplasia can still use a litterbox, but may need a larger box to make a better target. A lower lip on the litterbox may help.

Cats with cerebellar hypoplasia may be more prone to minor injuries due to falls or bumping into things. These cats should be kept indoors or on a leash at all times to keep them safe from the dangers of the outside world, and in cats with severe cases, it may be necessary to prevent access to stairs and to discourage climbing on furniture.

Affected cats can live with other cats and animals, but owners should be mindful when introducing them. Monitor other pets in the household closely to be sure that they will not attack or harm the new cat because she moves strangely. Some pets will adjust quickly, while others may never be trustworthy. Make sure that the cerebellar hypoplasia kitty can eat her meals in peace.

These cats often live long, healthy lives, and their wobbling can be quite adorable. It's just important to help them stay safe.■

# Tackling Mast Cell Cancer

## *Treatment varies with the tumor location and grading*

Mast cell tumors are the most common feline cancer of the spleen, the second most common skin tumor (accounting for 8 to 21% of all skin cancers in cats), and third most common tumor identified in the intestinal tract of cats.

Mast cells are a type of white blood cell, part of your cat's immune system. They are usually associated with allergic reactions, and they contain granules with enzymes, such as histamine, in them. These granules are released (called degranulation) as part of an immune-mediated inflammatory response that has evolved to destroy foreign invaders when mast cells encounter allergens that they have become sensitized to. The release of small amounts of histamine tends to cause sneezing and itching. A large release of histamine, though, can lead to whole-body symptoms, including anaphylactic shock, which is potentially life-threatening.

The cause of mast cell tumors is not well known, but environmental triggers are suspected. In dogs, there is a genetic mutation in a protein called KIT that is involved in most mast cell tumors. This mutation occurs in a protein that helps to regulate cell replication and division. About 67% of mast cell tumors in cats have this mutation.

Mast cell tumors in feline skin tend to be more benign and can often be cured with complete tumor removal. Mast cell tumors in the internal organs of cats, though, generally have a more aggressive disease course. About 15% of cats with splenic disorders have mast cell cancer of the spleen. When the intestines are involved, most cases are in the small intestine, but some have been diagnosed in the colon.

Most mast cell tumors appear in cats 10 years of age and older. These growths tend to be on the extremities (tail, limbs, head, and neck). They may develop as single growths or as multiple masses, and are generally pink, smooth or plaque-like, and associated with hair loss. In some cases, ulceration may occur.

For some unlucky cats, mast cell tumors may appear at a younger age, even in kittens. Luckily, many will regress spontaneously. This may take six to 24 months, so even in young cats, surgical treatment is often recommended.

### Symptoms

Clinical symptoms vary with the location and type of mast cell tumor. Skin tumors may be static, but they also may cause your cat to itch or bite at the affected spot due to histamine release. Some of the masses will periodically increase in size and become quite red due to the degranulation. This can happen if your cat is able to rub or scratch the affected area on her body.

*This cat's tumor, left, was treated with electrochemotherapy. The photo on the right is post-treatment. Notice the difference in the tumor size and healing.*

### What You Should Do

- Be aware of changes in your cat's body, skin, mouth, and eyes.
- Get lumps and skin growths evaluated by your veterinarian.
- Watch for symptoms like itchy skin, lethargy, decreased appetite, weight loss, diarrhea, and vomiting.

With splenic mast cell tumors, common signs include loss of appetite, weight loss, vomiting, diarrhea, and/or constipation. If the mass is primarily in the intestines, you may notice melena, which is black stool caused by digested blood that originates from ulcerations in the gastrointestinal tract. Abdominal mast cell cancer may cause a buildup of fluid in your cat's abdomen.

### Diagnostic Steps

Diagnosis of a skin mass may begin with a fine needle aspirate to provide cells for your veterinarian to stain and evaluate under a microsope. Your veterinarian may, however, decide that the best way to proceed is to go directly to a surgical biopsy, which means removing the mass.

Your veterinarian may be able to palpate an abdominal mass, and an abdominal ultrasound or radiographs may be recommended.

An important aspect of diagnosis of mast cell tumors is staging. This refers to a process that estimates how fast the cancer cells are growing, the size of the tumor, whether there has been spread to multiple parts of the body (metastasis), and whether any lymph nodes are involved in the tumor.

Staging usually requires careful microscopic evaluation of tissue samples, radiographs of the chest, and an ultrasound of the abdomen. Staging helps your veterinary oncologist determine prognosis and plan for appropriate treatment options.

With mast cell cancers in the spleen, removal of the spleen is usually important and may be curative in some cats. Unfortunately, even full surgical removal of intestinal masses does not usually impart a favorable prognosis.

Appetite can be an important prognostic indicator for cats with internal mast cell cancers. Cats with a healthy appetite when diagnosed may do well for some time, whereas cats that aren't eating

well when diagnosed often survive for much shorter periods of time.

### Treatment Options

Treatment will vary with the stage/grade and location of the cancer. For skin growths with clear margins and a low grade, surgery may be curative. If additional mast cell masses appear, these can be removed as well.

Radiation therapy or chemotherapy have proven helpful in some cats. Radiation is most useful for localized growths, for which the radiation can be focused. Chemotherapy is most useful for mast cell cancers that have spread to multiple organs.

Supportive care is important for cats receiving treatment beyond surgery for mast cell tumors. Massive histamine degranulations can lead to serious problems, including shock. Corticosteroids and H1/H2 blockers may be part of the treatment protocol. (H1 and H2 blockers are antihistamines that help stabilize receptors on the mast cell.)

Along with splenectomy, there have been some studies that looked at chemotherapy as a follow-up for cats with this cancer. One study published in *Veterinary and Comparative Oncology* evaluated 64 cats with splenic mast cell tumors. These were older cats with an average age of 13. Four treatments were evaluated: surgery alone, surgery plus chemotherapy, chemotherapy alone, and supportive care alone. Chemotherapy included corticosteroids to help reduce histamine release side effects. In this study, splenectomy (alone or with chemotherapy) resulted in the longest survival time. The authors felt that further investigation of the use of chemotherapy would be valuable.

Electrochemotherapy is a new treatment modality that has been used for canine mast cell tumors. This therapy involves the simultaneous administration of chemotherapy drugs and the application of electrical pulses, which may increase the permeability of cell membranes to chemotherapeutic drugs. This modality may hold promise for cats in the future.

### Bottom Line

Cutaneous mast cell tumors tend to be benign and can often be "cured" with surgical removal. Splenic mast cell masses have a much less favorable prognosis, but if caught early, surgery can significantly improve outcomes.■

# Ascites Is a Serious Symptom

## *Causes of fluid buildup in the abdomen are varied*

At first glance, your cat may appear to be getting fat, but then you realize her belly looks bloated and feels squishy. She has not been eating normally, is lethargic, and may have been vomiting. Chances are, that big belly is fluid buildup.

"Ascites" is the technical term for fluid accumulation in the abdomen. The fluid may be due to an injury, organ malfunction, or a systemic disease. Usually, the onset of ascites is gradual, making it difficult for most cat owners to notice at first.

### Diagnosis

Your veterinarian will do a thorough physical examination and may recommend an abdominal ultrasound to see the extent of the fluid buildup. Radiographs can identify ascites, but they are a much less sensitive test for this condition. In addition, a complete blood count, chemistry panel, and urinalysis may be recommended to try to determine the cause of the fluid buildup.

Fluid samples will be sent to a pathology laboratory for microscopic evaluation, which will give your veterinarian information about the cellular components of the fluid.

A classification of "transudate" indicates a low-protein fluid and suggests liver, kidney, vascular problems, or possibly an intestinal disease. A "modified transudate" generally means the fluid has evidence of inflammation. Modified transudates have increased protein and cells, including, in some instances, hepatic lymph cells or cancer cells. FIP and lymphocytic plasmacytic cholangiohepatitis (inflammatory liver disease) tend to cause modified transudate fluid.

However, notes Sharon A. Center, BS, DVM, DACVIM, Professor of Medicine in the Department of Clinical Sciences, College of Veterinary Medicine at Cornell University, right-sided heart failure, chronic hepatitis, and various cancers can all lead to ascitic fluid that is usually a pure transudate or modified transudate with low albumin concentration.

### Treatment

The main causes of fluid buildup in the abdomen include:

*An ultrasound is a noninvasive, non-traumatic procedure most cats don't mind.*

- Cancer
- Feline infectious peritonitis (FIP)
- Kidney disease
- Liver disease
- Pancreatitis
- Physical trauma
- Right-sided heart failure
- Ruptured blood vessel
- Ruptured urinary bladder
- Splenic trauma

Any cause of right-sided heart failure, such as some congenital malformations in kittens, may cause ascites. Heart problems are often picked up by veterinarians during routine physical examinations. Further testing may include an electrocardiogram (EKG) and an echocardiogram.

Many cancers will shed cells into the ascitic fluid, leading to a conclusive diagnosis if neoplastic cells are found and identified by a veterinary clinical pathologist. Abdominal cancers in cats include lymphomas, hemangiosarcomas, and a range of sarcomas and carcinomas.

While the fluid can be removed using a fine needle that is passed through the abdominal wall (abdominocentesis), this is usually not a cure and care must be exercised to maintain fluid balance and protein levels in circulation. Medications such as diuretics may be used to induce urination to decrease the degree of ascites in some patients.

The cause of the fluid buildup must be addressed to prevent it from recurring. For ascites secondary to trauma, surgery may be necessary.

Unfortunately, ascites is often not a good prognostic sign for your cat, but your best bet is to get your cat to your veterinarian immediately if you notice what appears to be fluid buildup in the abdomen of your cat.■

# Epilepsy: The Road to a Diagnosis

## *Potential causes must be ruled out independently*

Epilepsy is a neurological disorder that causes recurring seizures in cats. The Feline Health Center sees an average of four to five cats each week with a neurological disorder, says Curtis Dewey, DVM, Associate Professor, Section of Neurology/Neurosurgery at Cornell University.

Depending on severity, recurring seizures may occur from once every few months to multiple times a day. Seizures can range from a localized twitch or repetitive movement to full-body convulsions.

Since your cat cannot tell you if he had a seizure while you were at work, though, determining how many seizures may have occurred can be difficult. These variations add to the complexity of determining the cause of a seizure, whether it was an isolated event, and how to prevent further episodes.

Although this condition can be secondary to head injuries, metabolic irregularities, or tumors, a relatively common form is termed idiopathic epilepsy—so named because there is no discernible cause for the seizures that an affected cat experiences.

"Cats with idiopathic epilepsy are typically normal in every other respect," says Dr. Dewey. Fortunately, epilepsy is usually manageable with the daily administration of various medicines. For your veterinarian to make this diagnosis, all known causes for seizures in cats need to be ruled out.

### Physical Exam

Your veterinarian will do a thorough physical exam to check for any abnormalities, including an irregular heartbeat, severe ear infection, fever, or neurologic deficits such as a head tilt or poor reflexes. Results of the physical exam can help to narrow down your vet's primary concerns, ranging from toxic shock to an infection.

It's extremely important that you provide as much history as possible (see "What You Should Do"). Some neurologic issues can develop subtly over time but indicate an underlying problem within the brain, ranging from strokes to a tumor.

Traumatic events, such as being hit by a car or attacked by a dog, can cause trauma to the brain. The effects of such damage may be seen immediately or can be delayed as swelling and/or slow bleeding progresses in the brain. A poorly healed skull fracture could potentially impact the brain long after the initial incident.

If your cat got into something toxic, contact a pet poison control center immediately, but remember that bit of history for your veterinarian.

Bloodwork and a urinalysis are generally the first line of diagnostic tools and can be used to rule out possible causes and to detect signs of disease. Tests may include:

**Complete blood count (CBC).** This checks for anemia and signs of infection.

**Chemistry panel.** Most panels evaluate liver and kidney function, electrolyte and blood-glucose levels, the amount of protein in the blood, and levels of indicators of pancreas and other organ function.

**Thyroid test.** This checks for hyperthyroidism, which is an overactive thyroid gland.

**Feline immunodeficiency virus (FIV) and feline leukemia (FeLV) tests.** These infectious diseases are most common in cats that go outside and may encounter other infected cats.

**Urinalysis.** This checks for urinary tract infections, diabetes, signs of advanced kidney disease, and, rarely, certain parasites.

**Radiographs and Ultrasound.** Radiographs, or x-rays, and ultrasound allow your vet to look at your cat's organ systems for any problems. An enlarged heart, abnormal lungs, tumors, or signs of internal bleeding can all impact oxygen flow to your cat's brain or suggest metastatic tumors that may have spread to the brain and caused the seizure.

**Blood Pressure.** High blood pressure can cause capillaries in the brain to burst, and low blood pressure can result in poor blood flow to the brain. Low blood pressure is usually accompanied by shock, either toxic or after a traumatic event. High blood pressure can be more insidious and go undetected for long periods of time. Two of the most common causes of high blood pressure in cats include kidney disease and hyperthyroidism, but cats can have

*Your veterinarian will examine your cat's inner ear to rule out any ear problems that may be causing seizure-like movements.*

### What You Should Do

Bring your veterinarian a thorough history. Write down everything that you can think of, and bring the notes with you to your veterinarian so that you can be sure you do not miss anything. The more information you provide, the better the chances that your vet can pick up on a potential cause. Useful details include:

- When the seizure(s) occurred
- Length of the seizure
- What the cat was doing just before the seizure
- New medications (including flea/tick preventives)
- New houseplants
- Changes to routine
- A history of access to toxins such as plants, cleaning supplies, or medications
- Traumatic events
- How your cat acts after the seizure

primary high blood pressure. It may be necessary to track your cat's blood pressure over time to determine if it is a chronic issue.

**CT and MRI.** Computed tomography (CT) and magnetic resonance imaging (MRI) allow the veterinarian to see the structure of the brain. These scans are excellent for finding tumors, structural abnormalities, or signs of bleeding in the brain, and are highly recommended for cats who are having seizures. The downside to these two technologies is that they are only available at specialty clinics, are expensive, and require anesthesia or heavy sedation.

**CSF analysis.** Cerebrospinal fluid (CSF) exists within membranes that enclose the brain and spinal cord. It is possible to take a sample of this fluid via a spinal tap and analyze it for signs of infection or other abnormalities that may not show up in the main bloodstream. This is considered an invasive procedure and may require a visit to a specialty clinic. Your cat will be anesthetized and the area around where the spinal needle is going to be inserted will be shaved and scrubbed to keep it sterile.

**Electroencephalography.** Electroencephalography measures the electrical activity of the brain. This is a diagnostic tool used in humans with seizure disorders. Unfortunately, more research needs to be done in cats before it can be used effectively.

### Catch-All Diagnosis

Diagnosing a seizure disorder can be frustrating. The ideal course of action is to keep testing until all possible causes have been ruled out, at which point your veterinarian will arrive at a diagnosis of idiopathic epilepsy.

Unfortunately, this is not always possible. Discuss any financial or travel limitations with your veterinarian so that he or she can combine this information with the history you provide and the findings of the physical exam to determine which tests are most likely to yield useful results for your cat's case.■





# Understanding Antibiotics

## *Sometimes, these medications aren't the best choice*

An antimicrobial is an agent that kills microorganisms. Within the category of antimicrobials are antibiotics, antibacterials, and antifungals. All three medications can be life savers if used correctly. There are some caveats, however, which veterinarians use to make medication decisions.

Antibiotics are only effective for things like bacteria. They are pretty much totally ineffective when it comes to viral ailments. Pushing your veterinarian for a medication like an antibiotic when your pet has a viral illness doesn't make sense, healthwise or economically.

Sometimes your veterinarian's empirical (or best guess) choice of antibiotic for a certain type of problem is ideal. Your cat gets the medication, and the problem is solved. However, if there is no response to the drug, more diagnostics steps need to be taken to determine the next choice of medication.

This may begin with your veterinarian taking a swab sample of the discharge to examine to find out what class of bacteria might be infecting your pet. By learning if the bacteria are rods or cocci and gram negative or gram positive, your veterinarian can narrow down antibiotic choices.

A "culture and sensitivity" is frequently requested by veterinarians. In these cases, the lab will grow out and identify the offending bacteria and do testing to determine which antibiotics are most likely to be effective, which helps your veterinarian choose the best drug. Since the test is done in a lab setting, results will not always carry over to a live pet, but they are an excellent place to start.

As a cat owner, it pays for you to understand that antibiotics only work as well as your compliance. You must give the medication as directed at the recommended correct frequency and using the entire prescription. You cannot share the medication between pets. If a second cat becomes ill, he needs his own prescription. You also need to follow guidelines like giving with or without food. Following the directions will not only help your pet but will aid in preventing the development of antibiotic-resistant bacterial strains.■



# Get the Most Out of Eye Ointments

## *Tricks to help you get the desired results*

1. Bottles of eye drops and tubes of eye ointment are generally small because you don't need much of these medications and having leftover eye medicine is not always a great idea, as the chance of it becoming contaminated is significant.

2. If the medication label says to use one drop, that is all that is needed. If it's an ointment, you can use an amount equal to a small grain of rice, advises Shelby Reinstein, DVM, DACVO, on Vet Girl.

3. If your pet is on multiple topical eye medications, wait at least five minutes between dosing. Otherwise, the first medication may be "washed out" or heavily diluted by the second one. You need to give the medication time to be absorbed. It will be more effective and possibly save you expense and treatment time overall.

4. While your veterinarian makes the decision on what your cat receives for her eye problem, some cats will show an allergic reaction to eye medications that contain neomycin or polymyxin. Alternatives include erythromycin or tobramycin.

5. Cats with eye conditions related to herpes virus infections often do best if they receive systemic treatment (oral medications) as well as cleaning and topical treatment for their eye problems.■

# Thank You, Sweet Elizabeth

## *Her life story is what veterinary medicine is all about*

We are extremely sad to announce the recent passing of Elizabeth, our friend, mascot, and motivation for so many years. Elizabeth started life as a barn cat, and ultimately became the loving companion of former Cornell Feline Health Center Director Dr. Jim Richards, his staff, and many students at the College of Veterinary Medicine at Cornell University. Elizabeth lived at the Center for several years and spent the last 10 years of her life in the home of a kind-hearted and caring cat lover near Cornell.

Elizabeth's life is an excellent example of the difference that kindness and dedication can make in the lives of our feline friends and of the tremendous impact that a sweet kitty can have on so many. We will miss you dearly, Elizabeth, and thank you for all of the love and insight that you have provided to cat lovers the world around.

In keeping with Elizabeth's drive to educate cat lovers, we feel it is fitting to take a moment upon her passing to reflect on the notion of grieving. While cats provide us with so much love and companionship, since their lifespans are shorter than ours, it is common for those who love cats to ultimately have to deal with their passing. This can be an extremely difficult time, but it is important for those that experience it to know that grieving, defined as the pain that accompanies loss, is normal.

*Elizabeth 2003–2020*

There are several stages of grief, including denial, anger, bargaining, depression, and acceptance, and while bereft people experience most or all of these stages, they don't necessarily experience them in the same order. The support of friends and family can help while mourning the loss of a beloved cat, but everyone grieves in their own way. Knowing strategies to help cope with loss, including making a memorial scrapbook, saving fur clippings, creating a memory book or video, and planting a tree in memory of a cat can be empowering.

If grief causes you, a family member, or a friend trouble sleeping, eating, interacting with friends and family, performing daily tasks, or taking part in activities of daily living, professional assistance should be sought. There is absolutely no stigma attached to seeking such support, and Elizabeth would want us all to feel this way. You can find out more about how to cope with the loss of a beloved cat on the Cornell Feline Health Center's website at: https://tinyurl.com/CW-grieving.

Elizabeth was truly the embodiment of the Feline Health Center's mission. She was a stray kitty that benefited from the love and compassion of her special caregivers and veterinary professionals, and she gave so much love in return. Her story teaches us many things about hope, dedication, and the limitless possibilities of compassion.

Spirit fly, Elizabeth, and thanks for the memories, the wisdom, and for your true heart. ■

*Elizabeth's popular column will be continued by Bruce Kornreich, DVM, PhD, DACVIM, Director of the Cornell Feline Health Center and Editor-in-Chief of CatWatch. You can write to Dr. Kornreich at catwatcheditor@cornell.edu or CatWatch, 535 Connecticut Ave., Norwalk, CT 06854. We welcome digital photos of your cat to consider for use with your question.*

**Coming Up ...**

- *Help for Kitty's Chronic Runny Eyes*
- *Why Hepatic Lipidosis Is a Scary Diagnosis*
- *Pica Problems: Why Cats Love Wool*
- *Get Control of Hairball Vomiting*

## HAPPENING NOW...

***Rest in Peace***—CC (for Copy Cat or Carbon Copy), the first successfully cloned cat, was born in 2001 and died March 2, 2020, according to the *Houston Chronicle*. She gave birth to three kittens when she was 5 years old. Texas A&M University cloned CC with Genetic Savings & Clone Inc.

***More "No Sales"—The Star Tribune*** says bills are underway in Minnesota to restrict the sale of dogs and cats at pet stores. California, Maryland, and New York have worked on similar laws.

***Shelters Overwhelmed***—The ASPCA established a $5 million COVID-19 Relief & Recovery Initiative. The funds will be distributed to animal welfare organizations overwhelmed by the unprecedented number of animals being turned in to local shelters due to the coronavirus, according to *JAVMA News*.

***Cornell Research Grant***—The Winn Feline Foundation awarded $25,000 to Gary R. Whittaker, PhD, professor of virology at Cornell University, to study the mechanism of action of doxycycline in inhibiting feline infectious peritonitis virus. Over $304,000 was awarded to 44 grant proposals for 2020.

***Smart Momma***—A veterinary clinic in Istanbul, Turkey, was surprised to see a stray cat rushing toward them in the emergency area. She had a sick kitten in her mouth. The veterinarians immediately reacted, helping the kitten, while momma kitty watched. Both momma and kitty were given food and comfort and are expected to be fine.

***Food, Please***—According to *Simplemost*, a woman bent down to pet a stray cat in Piedras Negras, Mexico. The cat responded by going to the door of a nearby convenience store, clearly "asking" her to open the door. Once in the store, the cat went right to the cat food and scratched at the bag he wanted. He got both the food and a new home. The woman adopted him and named him Conejo. ■