THE 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

The Debate Continues

Study finds people still interested in vegan pet food

A University of Guelph online survey of 3,673 pet owners found that 35 percent of the responders whose pets ate conventional diets were interested in switching to a vegan diet.

Published in the journal *PLoS One*, the study says that 55 percent said they needed further evidence that a plant-based diet would meet their pets' nutritional needs and their veterinarian's approval and plant-based pet foods to be easily available.

Previous studies show that pet owners tend to offer the same kind of diets to their dogs and cats that they adopt for themselves. However, there has not been much research on the nutritional suitability of vegan diets for dogs and cats, nor on the health benefits and risks of plant-based diets in these animals, says lead author Sarah Dodd.

Cats, of course, are obligate carnivores, meaning they need meat in their diet to survive. Vegetarian or vegan diets are not recommended for cats. ■

Dodd. S. et al. Plant-based (vegan) diets for pets: A survey of pet owner attitudes and feeding practices PLOS ONE, 2019; 14 (1): e0210806 DOI: 10.1371/journal.pone.0210806.



INSIDE THIS ISSUE

Vitamins and Minerals for Kitten Diarrhea..2
Battling Family Allergies to Cats 2
Fungus in Brazil 2
AAFP on Vaccines 2
Drowning in Dandruff.....3
When Heart Failure Occurs.....4
Deciphering Drool 5
Ear Scratching and Headshaking 6
Bloodwork for Kidney Disease.....7
Can Heart Disease Reverse Itself?.....8
Happening Now 8

Keep Those Pawprints Perfect

It's easy to overlook paw-pad health

A cat uses her paws to scratch to relieve stress, express contentment, mark territory, avoid danger, and fight (if necessary). Amazingly, cat paws are extremely sensitive. They can feel heat, cold, and vibration. They even help keep cats cool (a paw can sweat). And yet, despite the many things cats do with their paws, the health of these unique extremities is often ignored.



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A cat's paw is a hard-working tool, responsible for emotions, protection, and cooling.

Self Health

Cats are fastidious groomers and normally keep the surface of the paw pads clear of dirt and debris such as litter. Still, it's important that you periodically check to be sure nothing is stuck to the paw pads. If you notice something on a pad, gently clean it off with a warm, damp washcloth. Be aware, though, that this could be a subtle sign of illness.

You may notice your kitty pulling the tips off of her claws. This removes the old, outer sheath, exposing healthy claw beneath. Be sure you have several different scratching posts available. Different textures offer choices and make it less likely that your cat will choose to use the furniture. If you are having a hard time convincing your feline to use a scratching post, try pheromones and catnip on the surface to entice her. Be sure to locate the posts in a spot she seems to frequent. A post hidden off in the basement may not get much use.

If your cat has long hair between the toes, keep it trimmed. Long hair can obscure toe and nail problems. In some cases, nails can grow so long that they curve and grow into the toe pads, which can cause pain and infection. In addition, extremely long hair can decrease the sensitivity and traction of your cat's feet.

Paw Problems

Extreme temperatures can cause trauma to the paws. Burns from both hot and cold pavement are not uncommon in outside cats. If the weather is extreme, check your cat's paws carefully when she comes indoors. Watch for cracks or scrapes. If the abrasions are swollen or red—or your cat is lame—have your veterinarian check her.

Cats can develop a rare condition called "pillow foot," aka plasma cell pododermatitis. The underlying cause is not well understood but may be related to allergies. Early signs include an inflamed pad and lameness. The swelling can become severe. Treatment is aimed at modulating the immune system with medication. If you notice swelling of the paws, a veterinary visit is in order.

With careful attention to paw pad health, problems can be identified early and addressed. Her paws are essential for good mental and physical health. ■

What You Can Do

Combat Stress: If your cat stresses during nail-trim time, ask your veterinarian about medications to minimize stress. Gabapentin, an anxiolytic and mild sedative, can be especially useful for this.

Use First-Aid on Cut Quicks: If you accidentally cut the quick in a nail and it bleeds, apply KwikStop powder or cornstarch to the area with gentle pressure to stop the bleeding. Monitor it to be sure that the bleeding stops and remember that, with an exposed quick, infection is possible. (See "Trim Those Nails" in our May 2018 issue, available at catwatchnewsletter.com, for nail-cutting tips.)

Vitamins and Minerals for Kitten Diarrhea

Survival rate was higher with the dietary supplement

The Journal of Feline Medicine and Surgery published a study (Strong, SJ, et al 2019), shared on journals.sagepub.com, that looked at treatment options for orphaned kittens with diarrhea. The study included 1,718 orphaned kittens and found that kittens who received a vitamin and mineral supplement were 12.8 times more likely to survive than those that did not. "Treatment with subcutaneous fluids, penicillin G, tube feeding, a probiotic containing *Enterococcus faecium SF68*, ponazuril, or metronidazole did not statistically significantly increase the survival of kittens with diarrhea," says the report. ■



Battling Family Allergies to Cats

Knowing the source may go a long way toward control

While cat hair takes the blame for causing cat allergies, it is the proteins in cat saliva that stimulate most human allergic reactions. The "dander" or dried saliva left on your cat's hair coat after she grooms—not the hair—is usually the true culprit. To reduce exposure, keep your cat well-groomed (microfiber cloth is great at grabbing dander), dust and vacuum daily, and limit your cat's access to specific rooms, such as bedrooms. Change furnace filters regularly, consider air filters in rooms, and wash bedding regularly. It also helps if you wash your hands after playing with the cat. Many cat allergies can be controlled with standard allergy drugs. Talk with your physician. ■



Fungus in Brazil

"Clown nose" is fatal in cats

The American Veterinary Medical Association (AVMA) reports that the Centers for Disease Control (CDC) is monitoring a fungal infection (*Sporothrix brasiliensis*) in Brazil and nearby countries that is being spread by cats to people. The infections in cats are known as "clown nose" because of the swollen, infected nasal mucosa seen in affected cats. It's usually fatal in cats.

"*Sporothrix schenckii* is found throughout the world, including the U.S.," says the report. "It causes 'rose gardener's disease,' a rare infection mostly linked to cuts and scrapes that are exposed to soil and plants. It can cause slow-healing lesions and, less often, respiratory infections or generalized infections with joint pain, headache, or seizures," says the AVMA. ■



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DID YOU KNOW?

AAFP on Vaccines

The American Association of Feline Practitioners makes recommendations on vaccine choices for cats that you can use in vaccination discussions with your veterinarian.

Core vaccines (for every cat):

- Rabies (may be legally required)
- Feline panleukopenia (FPV)
- Feline herpesvirus-1 (FHV-1)
- Feline calicivirus (FCV)
- Feline leukemia virus (FeLV) for at least the first year

Non-core (give if cat is at risk):

- Feline leukemia virus (FeLV)
- Bordetella bronchiseptica
- Feline immunodeficiency virus (FIV)
- Chlamydophila felis
- Feline Infectious Peritonitis (FIP)
- Dermatophyte ■

CatWatch

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Drowning in Dandruff

Unhealthy skin results in visible dandruff

Visable dandruff is rarely normal. It may indicate a problem in our care or an underlying health problem.

"All animals have very active skin, where new cells are produced every day and the old, dead cells are sloughed off into the environment," says Dr. William Miller, VMD, DACVD, Dermatology Section Chief at the Cornell University College of Veterinary Medicine. "This shedding usually is invisible because the sloughed cells are so small."

Imbalances in the amount of sebum on the skin can cause the skin to look and behave differently. "If the lipids or fluids within the skin are abnormal then the cells are sloughed in sheets that are visible to the naked eye. If the skin is diseased, it can produce more cells than normal and those aren't shed normally—hence dandruff," says Dr. Miller.

Causes

Allergies and parasite infestations are often first noticed as changes in the skin. A cat with allergies may exhibit red, itchy, flaking, and/or irritated skin. A cat with fleas may have flaking or irritated skin along his back and hind end. The fungal infection ringworm typically appears as a bald circular patch of flaking skin. More serious causes of dandruff include diabetes, hyperthyroidism, and other hormonal imbalances.

However, dandruff may be due to controllable causes, such as low humidity, sunburn, bathing with a shampoo not formulated for cats, or even stress. It also may be due to a cat who has difficulty grooming himself. The debris and excess sebum buildup causes dandruff, usually with greasy, unkempt hair.

Worry or Not?

"Dandruff caused by low humidity typically is no big deal," says Dr. Miller. So, if your skin has been dry and itchy lately, too, a humidifier may make everyone in the house more comfortable. If there has been a stressful change in your cat's routine, such as a move or adding a new pet, the dandruff should resolve once he has adjusted.

Persistent dandruff or dandruff accompanied by other symptoms is more concerning. "If the dandruff is due to too little fat in the skin or if the cat has a skin disease, then the dandruff indicates a health concern," says Dr. Miller. A veterinary exam is in order to rule out disease and discuss any changes in your cat's behavior or environment that might give clues to the cause of the dandruff.



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Take some time to find the grooming tool both you and your cat enjoy using.

Diagnostic measures include a comb check for fleas and a skin scrape for fungal infections, mites, and signs of skin disorders. Bloodwork will provide clues about systemic diseases and hormonal imbalances that may be causes.

Treatment

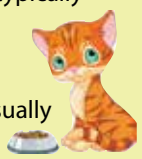
"The best thing is to figure out the cause for the dandruff and fix that," says Dr. Miller. "From a cosmetic point of view, the dandruff can be removed by combing or bathing." Underlying conditions such as dermatitis, diabetes, flea-bite allergy, or hyperthyroidism will require appropriate treatment to resolve the dandruff along with other symptoms.

Daily brushing stimulates the skin and removes dead hair and debris, and is a great bonding activity. Try different brushes to see what he likes and start by only brushing for a few minutes at a time.

For the cat who is otherwise healthy with clean, pink skin, it's bath time! Choose a shampoo that is formulated for cats, as your favorite suds may just make his dry skin worse. Limit baths to once every two to three weeks (or less frequently), unless otherwise directed by your veterinarian. ■

Turning to Diet

Diet may impact the lipid content of your cat's skin and contribute to dandruff. "If the cat is eating a low-fat food to lose weight or control some internal disease, then a nutritional change, especially with fatty acid supplements, can be beneficial," says Dr. Miller. "Healthy cats who are fed a good quality food won't typically benefit from a nutritional change. If the cat has an underlying skin disease, nutritional supplements usually do very little."





When Heart Failure Occurs

It's usually progressive, and early signs are easily missed

Any cat can experience heart failure, something owners may be unaware of until it's an emergency. The symptoms can remain "hidden" because cats are stoic and can often appear normal, even when they are very ill.

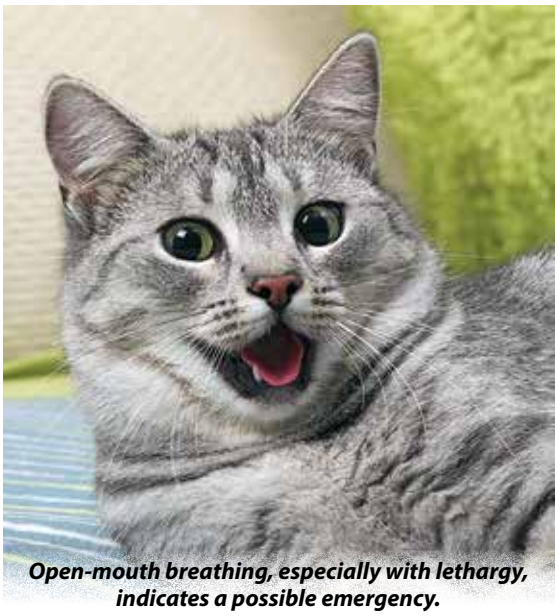
Most cases of heart failure are chronic and progressive, which means the heart failure is an ongoing condition that worsens over time, just as in people. Acute—or sudden onset—episodes of heart failure do, however, happen in cats.

Symptoms of Heart Failure

Signs that point to acute heart failure include "elevated respiratory rate, increased respiratory effort, lethargy, and exercise intolerance," explains Bruce Kornreich, DVM, PhD, board-certified veterinary cardiologist and Associate Director of the Feline Health Center at the Cornell University College of Veterinary Medicine.

A cat who is having difficulty breathing will often crouch, with her head extended straight out and elevated and elbows held out to the side. You may notice the cat's sides heaving as she breathes. This is an emergency.

Usually, an affected cat will be lethargic and/or unable to maintain activity. As heart failure progresses, signs of decreased blood flow (cold extremities, pale gums, weak pulses) may be observed.



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Open-mouth breathing, especially with lethargy, indicates a possible emergency.

Emergency

If your cat is having difficulty breathing, can't walk or move her hind legs, or you otherwise suspect heart failure, she needs to be seen by a veterinarian immediately.

Once at the hospital, the staff will attempt to stabilize the cat with oxygen, diuretics to help remove excess fluid, and medications to improve the ability of the heart to contract and/or to dilate blood vessels. Once she's stable, the veterinarian usually will begin diagnostic testing.

"Available diagnostics include echocardiography, electrocardiography, radiography, blood chemistry monitoring, and pulse oximetry to measure the oxygenation of the blood," says Dr. Kornreich.

Echocardiography uses ultrasound waves to visualize the heart. The veterinarian can see the dimensions of the heart and its chamber walls, as well as how fast and effectively it is contracting. This technology can rule out the presence of blood clots in the heart, which are relatively common with the dilated atrial chambers that are often seen in feline heart disease.

Electrocardiography, or ECG/EKG, measures the electrical activity of the heart and can tell if the heart is beating at an inappropriate rate and if some chambers are contracting out of order (called arrhythmia).

Radiography (x-rays) can show the size of the heart relative to the rest of the body and allows the veterinarian to observe the lungs, blood vessels, and surrounding tissues in the chest cavity.

Bloodwork assesses the function of major organs and may indicate whether infections are present and how much oxygen is being carried in the blood.

These tests are stressful for the cat, especially if she is in respiratory and cardiac distress. In some cases, the cat may be sedated to keep her calm while diagnostic measures are performed, or they may be postponed until the cat is stabilized.

Cardiac Treatment

Not surprisingly, treatment varies with the type and severity of the cat's heart disease. Medication to address the heart failure and prevent clot formation is most commonly required for the rest of the cat's life. Heart-specific medications include:

- Diuretics (such as furosemide) to treat fluid retention/congestion
- Angiotensin converting enzyme (ACE) inhibitors, such as enalapril, to dilate blood vessels and address negative physiologic response to heart failure
- Clopidogrel (Plavix) and/or aspirin to prevent clot formation in the heart
- Pimobendan (common off label use; FDA-approved for dogs) to increase cardiac pumping ability and dilate blood vessels
- Beta blockers (less commonly used) to control fast heart rates and minimize excessive oxygen consumption by the heart.

Causes of Heart Failure

Chronic heart failure is often related to issues with the walls of the heart.

Hypertrophic cardiomyopathy, a primary disease of the heart muscle in which the walls of the heart thicken over

What You Should Do: *Learn the signs of heart failure*

Early Symptoms

- Increased respiratory rate (over 40 breaths per minute)
- Inactivity
- Exercise intolerance
- Weight loss
- Decreased appetite

Emergency Symptoms

- Severely increased resiratory rate/ effort
- Paralysis (most commonly hind limbs) due to a clot
- Open-mouthed breathing
- Weakness, lethargy
- Collapse

time, is the most common heart disease in cats. It limits the amount of blood that can enter the ventricles during relaxation, decreasing overall cardiac output and the amount of oxygenated blood that is pumped to the rest of the body.

Restrictive cardiomyopathy refers to a condition in which the walls of the ventricle become inelastic and blood flow into them during ventricular relaxation is restricted. This predisposes the heart to abnormalities of ventricular filling, with resulting poor output and, ultimately, congestive heart failure.

Dilated cardiomyopathy is a condition in which the ventricular walls become thin and less able to contract, resulting in dilation of the heart, poor cardiac output, and ultimately congestive heart failure. It is not nearly as common as it was a few decades ago due to the appropriate addition of the amino acid taurine to cat foods.

Heart Defects

Other structural abnormalities within or outside the heart can impact its ability to transport blood. Problems with valves can either restrict blood flow or allow it to regurgitate in the wrong direction, predisposing to congestion and, in many cases, congestive heart failure.

Congenital heart defects can result in abnormal shunting of blood from the oxygenated part of the system to the side with relatively low oxygen, resulting in decreased oxygen delivery to the body. Excess fluid outside the heart, either in the pericardial sac that surrounds the heart (called pericardial effusion) or in or around the lungs, can also impair cardiac function and result in decreased delivery of oxygenated blood to the body.

Monitoring for Heart Disease

To watch for signs of early heart failure, Dr. Kornreich recommends you:

- Regularly visit the veterinarian (annually until age 10; then twice a year)
- Feed a nutritionally complete and balanced diet
- Maintain healthy weight

Some cat breeds, such as Ragdolls and Maine Coons for hypertrophic cardiomyopathy, can have genetic tests to screen for heritable heart conditions.

The most important thing is to be aware of your cat's normal status, so that if you notice she no longer plays or seems to have suddenly become finicky, you can get veterinary help immediately. ■

Deciphering Drool

Drooling may be a sign of a bigger problem

When you think drool, you think dogs, but cats drool, too. The difference is, feline drool is rarely normal. If your cat is drooling, she may be either overproducing saliva or having trouble swallowing it, and it is important to find out the cause.

Drooling Problems

The most common cause of excess drooling is a dental/periodontal problem, such as tooth resorption, stomatitis, or gingivitis. You might notice bad breath along with the drooling, a hesitation to eat or drink, redness/inflammation of the gums, or a buildup of tartar and plaque on her teeth.

Drooling red flags include:

- Blood in the saliva
- Bad breath
- Lack of appetite
- Weakness
- Lethargy

Oral cancers, such as squamous cell carcinomas, or a foreign body such as a piece of bone or wood stuck across your cat's hard palate, are possible causes. Cats also may swallow string, which can get stuck around the base of the tongue and trail into the gastrointestinal tract.

Any wound or injury to the mouth will usually stimulate increased drooling. Saliva soothes the sensitive tissues and helps to promote healing. Trauma, such as being hit by a car or falling from a window, that results in a broken or dislocated jaw can make swallowing difficult and painful. Electric shock (biting a cord) can injure sensitive oral tissues and cause excess salivation.



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A drooling cat needs to see a veterinarian to rule out an abnormal cause.

A cat battling kidney (renal) disease—common in senior cats—may drool. The buildup of toxins in the blood due to the decreased kidney function can cause uremia, which may lead to ulcers in the mouth, on the tongue, and on the gums. Extra saliva is often produced in these cases.

Liver disease, especially portosystemic shunts in young cats, can cause excess salivation. In fact, drooling is often one of the first symptoms of liver disease. This is secondary to toxin buildup and may be related to nausea. Anything that causes nausea in your cat can stimulate excessive salivation. Cats who get carsick will often drool heavily.

"Normal" Drooling

If you've ever tried to give your cat a bitter medication, you may have noticed increased drooling, especially if she holds it in her mouth prior to swallowing (or spitting it out, a skill that most cats have mastered).

Toxins can stimulate salivation. For example, many plants aren't seriously toxic but are irritants to oral tissues and may cause drooling.

It's wise to consider drooling in a cat abnormal until proven otherwise. If it's truly the result of an injury or illness, the faster you address the problem, the sooner you can control it. ■

Happy Drooling

"Happy drooling" is the term used when your cat is purring softly, kneading away, and drooling. It is theorized that this drooling may reflect back to kittenhood and happily nursing on their mother. If close inspection shows your cat has a healthy mouth and feels good, then it is likely simply her idiosyncrasy. Similarly, some cats will drool and purr softly as they rub or head butt against you. This might be a form of marking behavior, as they leave some drool to dry on you.



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Ear Scratching and Headshaking

Causes can vary with age, but hearing loss is a concern

When it comes to ears, there's a "Big Four" of common problems, says William H. Miller Jr. VMD DACVD, Professor of Medicine, Section of Dermatology, Medical Director, Cornell University Hospital for Animals:

- **Ear mites,** especially for young cats with bilateral disease
- **Inflammatory polyp,** likely offender in a young cat with one ear involved
- **Bilateral otitis,** common in older cats, especially with allergies
- **Unilateral otitis,** due to a tumor or foreign body in the ear canal.



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You shouldn't ignore it: A serious problem may be driving the cat to scratch his ears.

Ear Mite Infestation

Although kittens battle more than their fair share, mites can infest cats of any age. Mite infestations comprise 50 percent of all feline ear problems.

What It Is: Ear mites (*Otodectes cynaoti*) are an external parasite with a predilection for ears, although they can live on a cat's neck and head as well. They also infest dogs and wildlife like foxes (but they're not the common species found in rabbits). Dogs and cats can share these mites. Ear mites don't jump or run like fleas—they walk from one pet to another. If one pet is diagnosed with ear mites, treat all the pets in the family.

Cats can have as many as 1,000 mites in one ear. Sheer numbers lead to irritation, for sure, but some cats react more strongly than others. While mites may be seen with the naked eye, they are usually observed through a veterinary otoscopic exam or under a microscope.

Symptoms: Cats with ear mites shake their heads, paw at their ears, hold their ears at unusual angles, and/or rub their heads and ears. Usually, both ears are infested. You may see a buildup of dark wax or cerumen in the ears (looks like coffee grounds) and sometimes blood due to the cat scratching her ears.

Treatment: Many topical flea and tick medications kill ear mites. Start by cleaning the ear carefully (see July 2018 "Have You Heard?" available at catwatchnewsletter.com) and removing as many mites as possible. Your veterinarian may give you ear drops, especially if there is a secondary infection.

Ear Polyp

Polyps occur most frequently in cats 8 to 12 months of age, usually after a respiratory illness. What causes a polyp remains a debate, but viral respiratory infections are strongly suspected.

What It Is: An ear polyp is a benign growth that starts in the middle ear. Ear polyps can present in many ways (see also "When a Nasopharngeal Polyp Makes an Appearance," February 2018, at catwatchnewsletter.com), and they usually need to be removed. A polyp can interfere with breathing if it grows back up the Eustachian tube, which is a canal that connects the middle ear with the nasopharynx. Other polyps may grow in the ear canal itself, and some may jeopardize the ear drum.

Symptoms: Cats will exhibit respiratory problems, like sneezing. They may shake their heads, paw at ears, and display a head tilt. If a polyp pushes on the middle ear, you may notice the cat has difficulty walking due to a polyp-induced balance problem.

Treatment: Sedation is often

Less Common Ear Illnesses and Complications

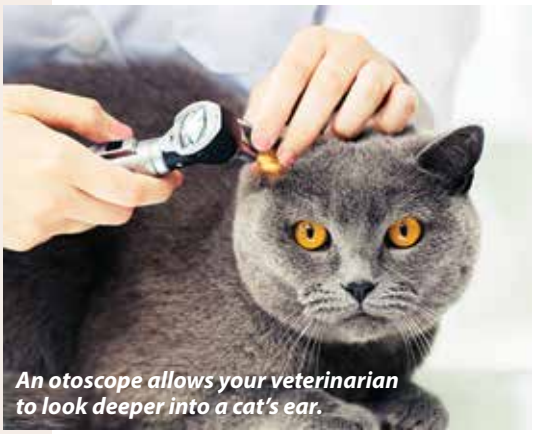
Severe Infections: Severe infections, whether bacterial, fungal, or mite-induced, may require sedation to do a deep ear cleaning. Some cats will show temporary vestibular signs, like a head tilt, after a deep flushing.

Hematoma: A side effect of ear mites and/or ear infections can be a hematoma. When scratching at the ear or vigorously shaking her head, your cat might cause blood vessels in the ear to rupture. As these bleed, they fill the limited space between the planes of cartilage in the ear, resulting in a painful, warm, and grossly swollen ear. "Hematomas will resolve spontaneously, but the pinna will tend to crinkle as the hematoma contracts. To prevent pinnal (outer ear) damage, the hematoma can be drained, and compression bandaged if the cat will tolerate a bandage. Surgery can be done to remove the clot once the bleeding has stopped," says Dr. Miller.

Foreign Bodies: Bugs, seeds, and plant material like foxtail awns can migrate into an ear. Some foreign bodies can be flushed out, though sedation may be required. Others require forceps to retrieve the offending foreign body.

Cancer: An adult cat with just one ear affected may have a cancerous growth. Secondary infections can cause a bad odor and purulent discharge. Squamous cell carcinomas can be seen on white ears with growth related to sun exposure. Superficial cancers caught early may be removed. Other cancers may grow down in the ear canal where usually they aren't caught early.

Cerumen Cysts: Caused by blocked oil glands, these cysts may appear bluish or dark in color. These are benign. However, they sometimes get big enough to limit airflow in the ear and need to be removed.



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An otoscope allows your veterinarian to look deeper into a cat's ear.

required to diagnose a polyp. Polyps in the ear canal are found on otoscopic examination, and sometimes steady traction will bring the polyp down, stretch it, and break the stalk. In rare cases, the polyp may have grown up around the bulla of the ear. Removal of these polyps requires more extensive surgery. Most polyps are benign, and removal is generally curative, but occasionally a polyp will grow back.

Otitis (Ear Infection)

Most ear infections start as otitis externa, which means the infection is limited to the external part of the cat's ear. Left untreated, it can spread farther into the ear. Otitis media (infection in the middle ear) or otitis interna (infection in the inner ear) can lead to deafness.

What It Is: Otitis is an infection that causes an overproduction of earwax and tissue damage. It can progress to a painful ruptured ear drum. Otitis media may cause vestibular signs, like head tilting.

Symptoms: Headshaking, a bad odor, and scratching are the usual initial symptoms. Itchy, red, and inflamed ears may be due to allergies, like atopy (allergic dermatitis), a reaction to inhaled allergens like pollen.

Treatment: A swab of the debris will be taken for examination under a microscope. The ear will be cleaned, and medicated drops or ointment will be prescribed. If allergy-related, treatment may include looking for the cause. Secondary problems, such as bacterial (smelly purulent discharge) or yeast (very inflamed, moist ears, possible clear discharge) infections, will be treated.

Depending on severity and the type of bacteria or fungus involved, your cat may need oral antibiotics as well as topical ear ointments or drops. Oral corticosteroids may be needed initially for relief.

Luckily, most cats go through life without ear problems. But if your cat shows any discomfort around her ears or any discharge from the ear, have a veterinarian examine her promptly. ■

Cleaning Tip

"Cats' ears are very sensitive and don't tolerate too much cleaning or medicating," warns Dr. Miller, "A veterinarian's instructions should be followed exactly." If the cat is bothered by the treatment, call your veterinarian.

Bloodwork for Kidney Disease

A renal panel is good for early detection

Kidney disease can be a serious problem, especially older cats, but it can be difficult to catch. Your cat must lose up to 75 percent of her kidney function before changes become evident on standard screening bloodwork. A routine urinalysis, however, may give your veterinarian a heads up that a blood renal panel should be run to specifically evaluate kidney function.

Sodium (Na) levels are controlled by a hormone called aldosterone, which is produced in the adrenal glands. High levels of sodium can come from a wide range of causes, including vomiting, diarrhea, kidney disease/injury, dehydration/decreased fluid intake, and the administration of intravenous fluids with high sodium content.

Chloride (Cl), sodium, and potassium work together in your cat's body. High chloride may occur when the kidneys are not removing enough acid from the blood (this often indicates kidney failure), with decreased water intake, the administration of drugs that cause Cl retention, diabetes mellitus, and with vomiting or diarrhea.

Hyperventilation can lead to increased chloride. In contrast, low chloride is often associated with vomiting, diarrhea, renal problems, and the administration of drugs that cause chloride loss (i.e diuretics).

Potassium (K) levels are primarily controlled via the kidneys and the endocrine system. High levels of potassium can interfere with cardiac muscle function—even to the point of death. Acute renal failure, urinary tract obstruction or rupture, and Addison's disease can all increase potassium.

Low levels of blood potassium can be deadly, too, which is why cats on low-potassium prescription diets and/or drugs that cause potassium loss require monitoring. While vomiting and diarrhea may lead to low potassium levels as well, kidney losses are the most likely cause.

Calcium (Ca) levels may rise with renal illnesses, some cancers, hypervitaminosis D, the ingestion of certain rodenticides, and some granulomatous fungal diseases. Hypercalcemia (high blood calcium) can cause renal disease, making it difficult to decide which came first—the calcium problem or the kidney problem. Severe hypercalcemia can be fatal.

Phosphate (P) levels most commonly rise with renal disease. Sodium phosphate enemas and some rodenticides can also cause hyperphosphatemia. Hyperthyroidism in cats may cause an increase in phosphate, as thyroxin (thyroid hormone) can interfere with renal clearance of phosphate.

Hypophosphatemia (low phosphorus levels) can lead to neurologic and musculoskeletal problems, ranging from seizures or ataxia to cardiomyopathy. High concentrations of an inhibitor of phosphate resorption by the kidneys sometimes develops in cats with chronic renal failure. In these situations, the kidneys fail to resorb the ideal amount of phosphate and an excess amount is lost in the urine.

Blood urea nitrogen (BUN) and creatinine (creat) are waste products that are normally filtered from the blood by the kidneys. Minor increases of BUN may be seen if your cat has recently consumed a meaty meal, but the most common causes of these molecules increasing are renal disease and dehydration.

SDMA, or symmetric dimethylarginine assay, is a biomarker of kidney function. SDMA increases early in renal disease, when only 25 percent of kidney function is lost, which is far earlier in the progression of disease than elevations in BUN and creatinine. Early diagnosis means earlier treatment.

While there is no cure for chronic kidney disease in cats, some interventions (such as a protein and phosphorus restricted diet) can at least slow the progression of the disease. ■



rashad_ashurov | Deposit Photos

Can Heart Disease Reverse Itself?

Echocardiogram shows he's now normal

Q Our cat was diagnosed with hypertrophic cardiomyopathy at 2 years of age, which was a shock to us, given the fact that he seems perfectly healthy. Our veterinarian did not prescribe medication and told us to monitor him closely.

He is now 3 years old, and we recently had a follow-up visit and an echocardiogram and were told that his heart is now normal. This was a pleasant surprise, as we were initially told that there was no cure for his condition. Can you provide some information about this mystery?

A Thank you for getting in touch, and I am happy to hear that your kitty's heart is now normal. Hypertrophic cardiomyopathy (HCM) is the most common heart disease in cats, and while there are things that can be done to medically manage cats with this condition, it is true that there is no cure for HCM. Characterized by a thickening of the muscles of the ventricles in the heart, cats with HCM are at risk for the development of congestive heart failure and clot formation, which can predispose them to a blockage of blood supply to various parts of the body (most commonly the hind limbs).

Other conditions that can cause thickening of the heart muscle must be ruled out before making a diagnosis of HCM: hypertension (high blood pressure) and hyperthyroidism. Once these have been ruled out, a presumptive diagnosis of HCM is made, and it is usually expected that this disease will be progressive, or that it will minimally remain stagnant, but not revert to a situation in which the heart becomes structurally normal.

More recently, a syndrome that is being referred to as transient myocardial thickening (TMT) has been recognized in cats. With TMT, the situation is usually similar to the experience that you have had with your cat. A presumptive diagnosis of HCM is made and then follow-up echocardiograms document a normalization of heart structure.

The thickening of the heart is often accompanied by an elevation of the concentration of a protein that is only produced inside heart muscle cells (called cardiac troponin-I, C-TNl) in the blood, suggesting that heart muscle cells have died and released C-TNl into the bloodstream, where it is detected.

Finding elevated C-TNl levels in the blood of cats usually is presumed to be due to inflammation in the heart muscle, a syndrome called myocarditis. Follow-up echocardiograms in cats with TMT demonstrate a normalization of heart structure that is commonly associated with a normalization of C-TNl concentration in the blood.

While the cause of this myocarditis (and TMT) is usually not determined, proposed mechanisms include viral/protozoal infections and autoimmune disease. Irrespective of the cause, TMT is becoming more commonly recognized by clinicians, and it is important to keep this syndrome on the list of potential causes of myocardial (heart muscle) thickening in cats. The prognosis for cats with TMT is generally good, while that for cats with HCM is usually guarded, and sometimes poor, depending upon their presentation.

I hope that this is helpful, and I'm very happy to hear that your cat seems to have a case of TMT rather than HCM; but it is important that you continue to work closely with your veterinarian to monitor his cardiac status through regular wellness visits. Please send us an update when you can.

All my best,
Elizabeth

Have a Question For Elizabeth?

Send Ask Elizabeth questions and letters to the editor to:

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We welcome digital photos of your cat to consider for use with your question.



Elizabeth works with the Cornell Feline Health Center to provide answers on this page (vet.cornell.edu/fhc/). Write to her at catwatcheditor@cornell.edu.

Coming Up . . .

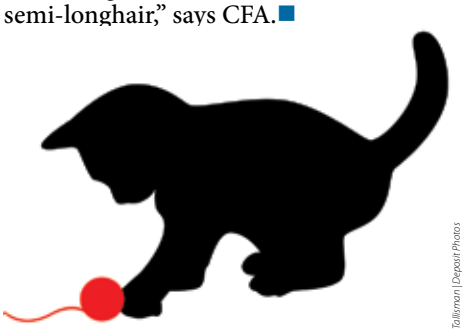
- *When to Use a Titer vs a Vaccine*
- *Is That Catnip Really the Good Stuff?*
- *Diarrhea: Worry or Wait*
- *Flea Collar, Spot-On, or Powder Choices*

HAPPENING NOW…

His Home Became a Cat House - The GoodNewsNetwork.org reports that a man in Santa Barbara, Calif., turned his home into the House of Nekko (translation from Japanese: House of Cats). Peter Cohen bought his home in 1988 and with it came two cats. It wasn't long before he adopted and rescued more cats, which made him add wall fixtures and catwalks to his home. Now every room has hiding places, scratching posts, and walkways. He even installed a koi pond. He has 22 cats now and runs his charity Zen By Cat out of his home. This nonprofit raises money for feline infectious peritonitis (FIP) research.

Newly Recognized Breed - The Toybob becomes the 45th cat breed recognized by the Cat Fanciers' Association (CFA) registry. The Toybob, a small cat with a bobbed and kinked tail, was developed in Russia over the past 35 years. It traces its origins back to a pair of stray pointed cats.

"Originally known in Russia as the 'Skif-Thai-Don,' the name was shortened to Toybob in 1994. Smaller in size than the average housecat, the Toybob makes up for its diminutive size with a loving yet lively personality. Toybobs can be found in myriad colors and patterns, with a coat length that is either shorthair or semi-longhair," says CFA.■



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