

THIS JUST IN

Diagnosis by Artificial Intelligence

May help avoid risky biopsies

Abdominal ultrasound is a vital tool in the initial evaluation of feline gastrointestinal (GI) diseases, including two common conditions that afflict cats, inflammatory bowel disease (IBD) and GI lymphoma. However, ultrasound cannot distinguish between IBD and lymphoma in cats, which requires a biopsy, which carries risks.

In a study funded by the Cornell Feline Health Center, Parminder S. Basran, PhD, FCCPM, Associate Research Professor, Section of Medical Oncology, at Cornell University's College of Veterinary Medicine is looking at how artificial intelligence (AI) may be used to enhance what we can learn through abdominal ultrasounds. AI has been used to diagnose human diseases.

This study will investigate the application of AI analysis of abdominal ultrasound (AU) images in cats with biopsy-confirmed diagnoses of IBD and GI lymphoma to determine whether it can be used to improve the ability of AU to distinguish these two diseases. ■



Be Alert for Signs of Fractures

Cats are so stoic they may not be obvious

Fractures happen in cats and kittens, even if they stay indoors. Falls from high areas, getting stepped on, or being crushed in a recliner are some common examples of how this happens.

Four key points about fractures:

- ▶ Cats have amazing healing powers, so even if you can't afford the gold standard of care, don't lose hope for healing of some fractures. Rest and restricted activity may be sufficient in some cases.
- ▶ Fractures in older cats with no known trauma may be pathologic fractures, which can occur secondary to bone cancer or other diseases that can weaken bone.
- ▶ When an outdoor kitty comes home non-weight bearing on a limb, it's not necessarily fractured. Infected cat bites can be as painful as fractures and often look the same at first glance.
- ▶ In some cases, limb fractures may not be amenable to surgical repair, and amputation may be recommended. In most cases, cats do quite well after recovering from limb amputation.

The treatment of fractures depends on their type and severity. When potentially expensive orthopedic surgical repair is recommended, you may wonder, why can't we just splint it?

The problem is, if the fracture is in many pieces (a comminuted fracture) or if the edges of the broken bone are not well-aligned and close enough together, it will never heal in a splint. If splinted, these types of fractures may result in what's called a non-union, which is a fracture that hasn't healed correctly by forming new bone. Non-unions most



Unless there's an underlying condition, your cat has an incredible ability to heal if given proper care.

commonly require surgical intervention. To make matters worse, you will have spent six to eight weeks confining your cat and managing a splint (which is no small feat) with a poor outcome. This splint complication can be as big a problem as the original injury.

If your cat's limb fracture is one that requires orthopedic surgical repair, there

(continues on page 2, bottom)

What You Should Know

The most common sites for fractures are the jaw, femur, tail, and pelvis.

Symptoms include:

- ▶ pain
- ▶ swelling
- ▶ changes in behavior
- ▶ non-weight-bearing limbs
- ▶ vocalization
- ▶ loss of appetite, drooling (with jaw fractures)

Types of fractures:

- ▶ compound: visible break in the skin
- ▶ closed: no break in the skin
- ▶ comminuted: multiple breaks in the same bone

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Study Targets Raw-Diet Safety Issues

As raw foods grow in popularity, research is needed

The very words “raw diet” can evoke a strong response (pro or con) when mentioned among cat lovers. Issues of concern include the potential for illness caused by infection by bacteria and parasites of cats and their owners, the development of antibiotic-resistant bacterial strains, and the veracity of statements by commercial pet food companies regarding the meats used in formulating raw diets.

In a study funded by the Cornell Feline Health Center, Laura Goodman, PhD, assistant research professor in the Department of Population Medicine and Diagnostic Sciences at the Cornell University College of Veterinary Medicine, is using molecular biologic techniques to characterize the bacterial and parasitic populations (including antibiotic resistant strains of bacteria) and the sources of meat used in a variety of commercially available raw cat foods to help quantify the potential risks of feeding commercially available raw foods to cats and to investigate whether their ingredients lists accurately represent the meats used in their production. ■

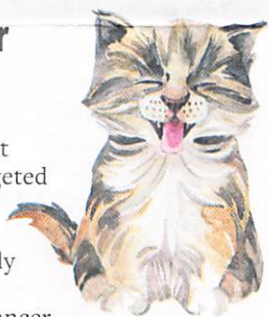
Photodynamic Therapy for Oral Cancer

Goal is to precisely kill cancer cells

Morris Animal Foundation-funded researchers at Utrecht University in the Netherlands are using nanobody-targeted photodynamic therapy to tackle oral squamous cell carcinoma in feline patients. The method utilizes light, along with a tumor-cell targeted, light-sensitive chemical to precisely trigger cancer cell death, the Foundation reports.

Oral squamous cell carcinoma is the most common oral cancer in cats, accounting for roughly 8% to 10% of all cancers diagnosed. The tumors make eating and drinking difficult and are painful. The cancer spreads locally and imbeds deeply into the oral tissue, making complete surgical removal rare. Once diagnosed, the average survival time for feline patients is three months.

While conventional photodynamic therapy uses light and a light-sensitive chemical to treat cancer, nanobody-targeted photodynamic therapy uses tumor-cell targeted antibody fragments coupled to the chemical, offering a more precise treatment, the Morris Animal Foundation reports. ■



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Fractures ... (continued from page 1)

are usually valid reasons for this recommendation. If surgical repair is technically or financially impossible, limb amputation may be a reasonable alternative. This procedure is often more affordable than orthopedic repairs, and cats usually fair very well with three legs.

If your veterinarian says you can use a splint on a limb fracture, the splint must immobilize the joint above and the joint below the fracture to minimize movement of the fracture edges. This can be difficult to achieve, especially with hind limb fractures. Unfortunately, most cats don't love splints, and they will work hard to get them off. Crate restriction for six to eight weeks is usually recommended to keep the cat quiet and to allow the splint to stay on as the bone heals.

Orthopedic repair is usually done by a specialist and may involve pins, screws, or plates. This internal fixation allows for the fastest, most correct healing, and negates the need for bandages or splints in most cases. Exercise restriction is still recommended to ensure success, but you won't have to do it for as long as with a splint.

Pelvic fractures are common in cats that are struck by cars. Some will require surgical repair, but if there is no neurologic damage, if the integrity of the pelvic canal has been maintained, and if the cat can urinate and defecate without issue, many pelvic fractures will heal on their own with eight weeks of crate rest.

If your cat experiences a fracture, your veterinarian is your best source of information, support, and guidance, and, in some cases, referral to a board certified veterinary surgeon may be warranted. ■

Cornell CatWatch

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Oncology

CONTRIBUTING WRITERS

Eileen Fatcherich, DVM
Katherine Basedow, LVT

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Cornell Veterinary Medicine

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Send questions and letters to the editor:

CatWatch
535 Connecticut Ave.
Norwalk, CT 06854-1713
catwatcheditor@cornell.edu

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All My New Cat Does is Hide!

Help kitty settle in and bond with you more quickly

Cats can be elusive, especially when they are nervous and don't want to be found. We understand that if your new cat spends most of her time hiding from you, you might be worried that she isn't going to bond with you. It will take time, but you can help your cat along.

1 Be patient. “The new kitty is frightened and needs time to feel secure enough in her new home to come out from hiding,” says Pamela J. Perry, DVM, PhD, Behavior Resident at the Cornell University College of Veterinary Medicine. Your cat just had a huge life change. New home, new people, new pets (if you have others already). This is a lot for a cat to take in! Expect that it will take at least several days, possibly several weeks, before your cat is comfortable strolling through the house.

Make the world outside her hiding spot more attractive. “Leave tasty food and treats nearby for the new kitty,” says Dr. Perry. “The aroma will entice her to leave her hiding space.”

Allow your new kitty to explore the house at her own pace. Usually, it is best to limit a new cat to a large dog crate or a single room at first so she can learn where her food, water, and litter box are, then gradually expand her territory. When giving her access to a new room, just leave the door open and let her check it out when she wants to. Many cats may wait until evening to explore because the darkness makes them comfortable, but always make sure your kitty has a path back to her “safe zone.”

2 Make sure other pets are being polite. Any dogs and other cats that you have are probably very interested in the newcomer, and this attention can be overwhelming. A looming dog, whether friendly or not, can be scary for a cat and may cause the cat to hunker down and stay put in her hiding spot.

And resident cats don't always give the warmest welcome. Your first cat may guard key resources, such as food or the litter box, so it is important to have at least two of everything so that the new cat can get to whatever she needs even if the other cat isn't keen on sharing.

3 Hang out and chat. Get your new cat accustomed to your voice, smell, and mannerisms simply by spending time near where she likes to hide. Stay on the opposite side of the room at first, if possible, and read aloud or talk on the phone (light conversations only—no yelling at the FedEx driver for losing your package!). You can also work on your laptop or do some crafting or household chores. Getting to observe these activities lets your cat know that you are not a threat, and that you coming into her room doesn't mean she's going to be bothered.

Over time you can get more animated, moving around the room more, going in and out, and starting to make eye contact with your new kitty and move closer to her hiding spot.

You can sit in the room while your cat is eating so that she associates you with tasty food. Wait a couple days before trying this though, as initially many cats

are so stressed by a move that they won't eat in front of an audience.

4 Physical contact on her terms. “Do not approach,” says Dr. Perry. “Instead, let the cat be the one who initiates contact. If she approaches, calmly extend your forefinger to see if she sniffs it. If she rubs against your finger, it's a sign that she might welcome some gentle scratching under her chin or along the sides of her cheek.” If your new kitty ducks away, don't push the issue. She will feel more comfortable being close to you if she knows she can get away if she begins to feel uncomfortable.

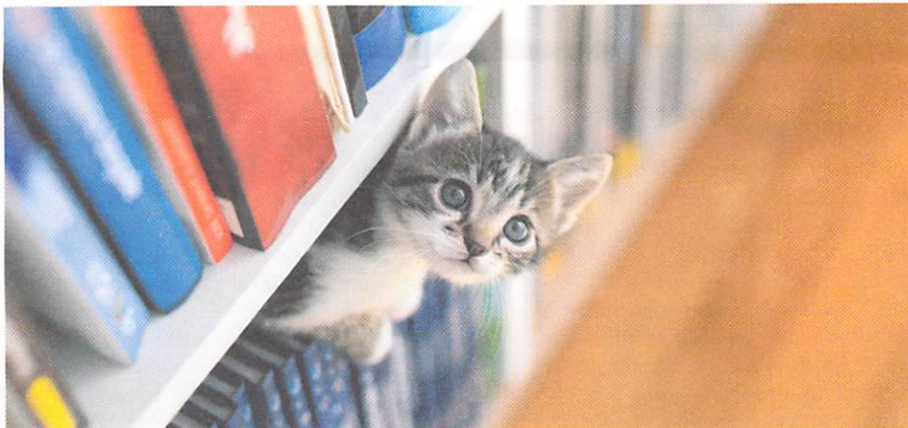
The first few times your new cat hops up onto furniture near you, don't reach out to pet her. Let her explore the couch or chair and just hang out with you. If she approaches, calmly see if she is interested in being petted. Many cats will pick a “favorite” person that they allow to pet them first, but over time, your cat will usually become comfortable with the whole family.

5 Engage in play. You may be thinking, “My cat is afraid of me! She's not going to play!” But there are little games that you can play with your new cat from a distance. If she is food motivated, toss a kibble or cat treat into her hiding spot where she can easily reach it. As she gets quicker about snagging the treat, toss it so that she must inch out of her shelter a little. Depending on the room, you can get her to chase kibbles farther away from you first, and then work on having them land closer to you. You don't want to overdo this game, because she will get full and/or bored quickly, but 10 to 12 tiny treats at a time should leave her wanting more.

You can play a similar game using rolling toys but will need several toys. Roll one gently toward where your cat is so she can bat at it then, when she grows tired of that one, roll another.

A toy on a long string or wand makes play at a distance even easier. Just wave the toy in front of your kitty's hideaway to get her engaged and, over time, lure her out. Don't try to touch her while playing unless she voluntarily approaches you—you don't want her to think that the wand toy is a trap.

Using these strategies helps your cat to feel more comfortable in your home and come out of hiding. Be patient and know that soon enough you will have a furry friend running through the halls! ■



With a little time, patience, and gentle interaction, your new kitty will leave her favorite hiding spot and soon be everywhere you are!

Alert: Urinary Emergencies

Blockages occur most frequently in the colder months

A straining cat and a dry litterbox are reasons for concern. Straining is most commonly associated with urinary problems. You may notice your cat urinating—or attempting to urinate—in odd places like the sink, bathtub, or a dark corner. This may be because your cat is associating the pain of trying to urinate with the litterbox.

Urethral Blockage

Cats are prone to urinary problems, ranging from mild inflammation to urethral blockage. Unfortunately, many of the initial signs can be deceptive until your cat is critically ill.

Any cat prone to cystitis (bladder inflammation) or crystal formation in his urine could eventually have a urethral blockage. Cystitis is more common in males, as their urethra has a smaller diameter and is longer than the urethra of female cats.

Urethral blockages are an emergency. Retained urine can lead to your cat resorbing many of the toxins and metabolites that should be eliminated in urine. Left untreated, they can be fatal.

Risk factors include being male and time of year, with winter months being of particular concern. While the reason for this seasonal association is not clear, decreased water consumption and decreased activity have been proposed as potential factors.

Indoor cats, especially if they are not active or are overweight, have a higher



The male feline urethra has a tiny diameter that makes inserting a catheter a challenge.

risk of blockage. Stress, from living in a multi cat household, moving, or dealing with aggression from another cat, may contribute as well. Consuming a primarily dry diet while not drinking enough water is a risk factor.

Types of Blockages

Two types of urinary tract blockages are the most common in cats. First is a “cellular plug,” which is a compacted clump that may include protein, mucus, cells, cellular debris, and crystals. Cats with urethral plugs often suffer from feline idiopathic cystitis, which is likely the most common urinary problem, especially in cats under 10 years of age. Idiopathic, of course, means “of unknown cause.” It’s frustrating for owners and veterinarians.

The second-most common blockage is uroliths (stones) or an accumulation of urinary crystals that block the orifice. Rarely, cats can have urethral spasms in response to pain or inflammation that shut down the urethra.

Struvite (composed of nitrogen, phosphorus, and magnesium) is the most common component of crystals and stones in blocked cats. Dietary changes can help to dissolve bladder stones of struvite and prevent recurrence of crystal buildups of this mineral complex. This often involves using a prescription diet.

Diagnosis

Diagnosis of urinary blockage is usually made via the clinical history of straining in the litterbox with little or no urine produced and a large urinary bladder identified during physical examination. This examination is performed very gently to avoid rupturing the bladder. If the bladder has already ruptured and your cat has free urine in the abdomen, the prognosis is poor.

While a blood chemistry panel is not needed for diagnosis, it can provide valuable information. Cats that have been blocked for very long will often have high levels of potassium in the blood (hyperkalemia). Hyperkalemia can predispose to life-threatening cardiac arrhythmias and neurologic problems.

Initial Treatment

When a blocked cat is presented at the veterinary clinic, one of the first things done is to relieve the distended bladder. This is often done by cystocentesis, a procedure that involves draining the bladder via a needle that is passed through the abdominal wall. For cats that are less ill, catheter placement may be the first step. Any urine obtained should be microscopically evaluated (urinalysis), and cultures of the urine should be obtained. Meanwhile, intravenous fluids are often started to help flush away toxins and encourage kidney function. Calcium gluconate, dextrose, sodium bicarbonate, and/or insulin may be administered to help reduce the potassium levels, depending upon how elevated they are.

The next step is to unblock the urethra. Sedation is almost always required to place a urinary catheter. Rarely, some cats relax enough under sedation that a cellular plug can be massaged out of the end of the urethra to allow free urine flow. Placing a urinary catheter requires patience and a gentle hand. Any crystalline blockage will usually be pushed back into the bladder.

Atracurium besylate is an antispasmodic medication that can temporarily paralyze the muscle lining the urethra, and flushing this into the urethra may facilitate the removal of any urethral plugs.

Once in place, the catheter is used to drain any urine left in the bladder and then the bladder is flushed to remove any small crystals and cellular debris. Depending on the individual case, the catheter may be sewn in place for

You Should Know

Symptoms of Urinary Problems

- ▶ Blood in urine
- ▶ Frequent urinating
- ▶ Licking genital area
- ▶ Absent or decreased amounts of urine
- ▶ Spending longer times in litter box, especially with little result
- ▶ Urinating out of litter box
- ▶ Pain with urination
- ▶ Straining to urinate

between 24 to 72 hours. The average time for a urinary catheter to remain in place for a cat with urethral obstruction is 48 hours. For mild cases, it may be removed after the bladder is thoroughly flushed. Spasmodic drugs, urethral relaxants, or anti-inflammatories may be given to settle irritated tissues.

Cats with recurrent blockages or that have suffered for a prolonged period with a greatly distended bladder may suffer from a bladder rupture or from urinary nerve and muscle damage that can prevent the ability to urinate normally. A bladder rupture requires emergency surgery. Bladder nerve and muscle damage may resolve with time and medications, but the prognosis is usually poor once this type of damage has occurred.

Recent studies show that cats have less chance of a recurrence within 30 days if a catheter is left in until there is normal urine flow, both in amount and appearance. You want to have all blood clots, small crystals, and cellular debris flushed out. While urethral irritation is a consideration with a catheter left in, this can be managed with medications.

It is important to have your cat in the hospital and under veterinary observation until potassium levels have normalized. While most cases of urinary obstruction do not have bacterial infections, your veterinarian may decide to culture a catheter that has been left in for a couple of days to rule out any secondary infections. Cats should show normal urine production and flow before being released from the veterinary clinic.

Follow-Up

Once your cat is stabilized, with the bladder emptied and flushed and potassium levels normalized, your veterinarian may recommend some more diagnostics to clarify the cause of the blockage. Radiographs and/or ultrasound will show any bladder or kidney stones. A dye study may be used to look for any ruptures in the bladder or urethral walls.

Alternatively, cystoscopy (passage of a small flexible camera into the urethra) allows direct evaluation of the urethra and bladder walls. This might be combined with a shock wave or laser fiber to break up stones in the bladder or urethra (called lithotripsy). This is more commonly done in dogs, but it can be done in cats.

Follow-up blood work to check potassium levels and kidney function,



A sad, lethargic cat is generally one that is not feeling well.

and electrocardiograms (EKGs) to monitor cardiac health are important.

Surgical Treatment

Unfortunately, some cats will suffer from a recurrence of urinary blockages. These cats may benefit from a surgery called a perineal urethrostomy (PU). “We usually recommend a PU on the second offense. If dietary and environmental management were given a good try and were found to be ineffective, especially if it is within six months of the first episode, then we recommend PU surgery,” says James Flanders DVM DACVS Emeritus Associate Professor, Section of Small Animal Surgery at Cornell University’s College of Veterinary Medicine.

A PU surgery may sound drastic, but many cats thrive after having the surgery. The goal is to provide a permanent opening wide enough that crystals, mucus plugs, cellular debris clumps, or small stones can pass out of the urethra. It does not change the underlying cause of the problem but allows the cat to have a “work around” solution.

Much of the penis is removed during a PU surgery in male cats since the penile urethra is quite small. “The urethral lumen is only 1 millimeter (mm) in diameter in the male cat penis. It is 4 mm wide in the pelvic urethra. So, it is very important that the stoma (opening) be made using the pelvic urethra,” says Dr. Flanders. The pelvic urethra is pulled backward (toward your cat’s tail), incised, and sutured to the skin under the tail. Many people think of it as turning your male cat into a female, at least urethra-wise.

Aftercare is extremely important. Your cat may need a catheter in place

as the tissues heal and he will need to wear a cone to prevent him from licking at the surgical site or chewing out his sutures. If possible, surgeons try to use dissolvable suture material, but some cases will need suture removal. Once the surgery site is healed, most cats do fine.

Dr. Flanders has found the most common surgical complication is stricture, usually due to inadequate dissection and not finding the pelvic urethra. “There really aren’t many other common complications. Some people are concerned about an increased risk of urinary tract infections because the urethra has been shortened. This is very rarely a problem because the good urine stream is able to keep the urethra free of contamination.”

Minimizing Risk

Cat owners would prefer to prevent an episode of urinary obstruction completely and avoid a recurrence if possible. There are things you can do to help your cat avoid urinary problems:

Consider switching your cat to canned food if he eats dry food. Some cats may need a prescription urinary diet. Other cats will tolerate water being added to their normal diet.

Encourage drinking. Make fresh water always available. Provide multiple options with a minimum of one bowl per cat. If your cat prefers a fountain, make sure you have one available. Adding a few drops of tuna juice to a bowl can encourage drinking.

Make sure you have an adequate number of litterboxes, in easily accessible sites. Clean daily.

Practice stress management, if needed. Use pheromones like Feliway, limit your cat numbers to a small compatible group, and try to establish a set routine for the household.

Watch your cat’s weight to avoid obesity. Encourage activity and provide enrichment in the environment plus play time with you. ■

Fit and Trim

Does neutering of male cats increase risk of urinary blockage? The experts say no. Neutered male cats may be at more risk, however, if they are overweight and inactive house cats. Being fit and trim reduces the risk for many health problems.

Chemotherapy Support

This life-saving therapy needs careful administration

When we think about chemotherapy, the first thing that often comes to mind is the side effects that people suffer. Chemo for pets is different. First, the goal is usually not a complete cure that can last for decades. Instead, the veterinary goal is prolonged remission, hopefully giving your pet close to a normal lifespan with good quality of life. Accordingly, treatments are not usually as aggressive.

Chemotherapy destroys cancer cells, which rapidly divide, by disrupting cell division. Unfortunately, some normal cells that also divide rapidly, such as bone-marrow cells, also can be affected. This side effect is why your cat needs periodic bloodwork. Side effects can also hit the gastrointestinal tract, with signs ranging from mild nausea and inappetence to diarrhea and vomiting.

“Cats handle chemo better than dogs, so they typically experience fewer side effects. 80% of pets have no

side effects. In the 15% to 20% that do have side effects, they are typically not severe,” says veterinary oncologist Susan Ettinger, DVM DACVIM (Cornell, '98). For cats, nausea is the most common problem owners see.

Dealing With Nausea

Mirtazapine (Remeron), a human anti-depressant, is often used as an anti-nausea drug for cats. The drug helps to control vomiting and acts as an appetite stimulant, making it a great two-in-one medication for cats on chemo. It has traditionally been given as an oral pill.

Mirtazapine transdermal ointment (Mirataz) is an FDA-approved form of the same drug that is applied to the ear as a transdermal ointment. Because it eliminates the difficult job of getting your cat to consume a pill, this may be your veterinarian's first choice.

Cats that are nauseous and not eating should be offered frequent small meals.

Smelly foods like tuna are your best first bet, and lightly warming the meals may also encourage eating.

Rarely, cats receiving chemotherapy may experience diarrhea. If this is the case, consider putting your cat on a bland diet. Don't worry about a balanced meal for a day or two as you work to get her gastrointestinal tract back to normal. Boiled chicken breast or hamburger can be enticing.

Other Side Effects

Fever is a sign that your cat may be having problems post-chemotherapy. While many of us prefer to use ear thermometers, rectal thermometers give the most accurate results. Digital thermometers are especially fast and accurate. If your cat has a fever (temperature over 103°F), Dr. Ettinger says to contact your veterinarian.

If you see bloody urine, call your veterinarian. Bloody or frequent urination could mean a bladder infection secondary to your cat's lowered immune system due to the chemo.

Your cat may become dehydrated secondary to fever or nausea. You can encourage water consumption by adding flavoring to your cat's water. Juice from tuna packed in water is one popular choice. Some cats will drink more if left a slowly dripping faucet or from a pet

(continues on page 7, bottom)

Precautions for Home Chemotherapy Treatments

If you are giving your cat chemotherapy medications at home, you need to take some precautions. If you are pregnant, breast feeding, or immunocompromised, it is preferable that someone else administers the treatments and handles the drugs.

The person giving the drugs should wear tight-fitting latex gloves so he or she won't drop pills and won't have direct contact with the drugs. Wash your hands thoroughly after treating your cat and throw away the gloves. Medications must be dispensed as they are to be given. Avoid breaking up pills.

Store medications in their original containers. If a pet, child, or other household member mistakenly gets into them, notify your veterinarian, family physician, or a poison-control center immediately. Keep medications away from food, ideally in a safe spot with a lock.

Whether chemotherapy drugs are given intravenously or orally, metabolites (waste products from the metabolism of the drugs) will often be excreted in the urine and/or stool. Wear gloves to clean your litterbox and clean the box at least once a day. Keep other pets away from the litterbox. This must usually be done for 72 hours post treatment, but check with your veterinarian to be sure. Dispose of the waste as directed by your veterinarian. Dr. Ettinger recommends washing any soiled bedding separately and for two complete cycles before you reuse it.



With all forms of chemotherapy, it is extremely important that you are aware of—and follow!—all safety protocols.

Cancer Research

Veterinary oncologists know that many tumors do not respond well to chemotherapy, but they can't identify which before treatment. The Cornell Feline Health Center is funding research by Kelly R. Hume, DVM, DACVIM, associate professor of oncology at the Cornell University College of Veterinary Medicine, into the use of metasurface-enhanced infrared reflection spectroscopy (MEIRS) to detect salinomycin-induced membrane changes in feline cancer cells. Salinomycin is a drug that has anti-tumor properties and improves the effectiveness of doxorubicin, a common chemotherapy drug. If MEIRS can detect structural and functional changes in the cancerous cell membranes, it may help determine if doxorubicin is likely to be effective prior to its use.

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fountain. In some cases, cats may need subcutaneous fluids, which you can learn to give at home.

Direct Medication Effects

If you suspect a medication may be causing side effects, contact your veterinarian before making any changes.

Your cat may receive her chemo medications as intravenous injections at the veterinary clinic. When she comes home, watch the injection site for any swelling, redness, or pain. Some chemotherapy drugs can be given orally and may be dispensed for you to give at home. If your cat is notoriously difficult to pill, ask about compounding options that might make it easier. Sometimes a liquid flavored oral version can be made up for your cat. ■

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Feline Hypothyroidism

This disease is not as commonly diagnosed in cats as feline hyperthyroidism is, but it can occur

Q Our 16-year-old, neutered male cat has been hyperthyroid since 2016. He has been treated with transdermal methimazole up until recently, at which time we switched to oral methimazole.

After approximately three weeks, his bloodwork showed that his thyroid level decreased significantly, and he was exhibiting symptoms of hypothyroidism (lethargic, constipation).

I've tried researching hypothyroidism in cats and can't come up with any solid answers. Is there anything that you can tell me about this condition in cats?

A Thanks for getting in touch, and I am very sorry to hear of your boy's problems. It is true that while we talk frequently about feline hyperthyroidism, primarily because it is very common in older cats, we rarely discuss hypothyroidism. This is because it is much less common than hyperthyroidism, and usually occurs not as a primary disease, but rather in cats that are being treated for hyperthyroidism.

Let's start with a brief review of feline hypothyroidism.

In contrast to hyperthyroidism, a condition characterized by an overproduction of thyroid hormones by the thyroid gland, hypothyroidism refers to a condition in which the thyroid gland does not produce enough thyroid hormone. This occurs far more commonly in cats that are being treated with drugs, radiation, diet, or surgery to decrease thyroid hormone production in cases of primary hyperthyroidism (referred to as iatrogenic, caused by the therapy itself) rather than as a primary disease, although the latter has been reported.



The prognosis for hypothyroid adult cats is good, with appropriate management.

In iatrogenic hypothyroidism, management is usually focused on either decreasing the dose of drugs that decrease thyroid hormone production (if drugs are being used to manage the disease), supplementing with synthetic thyroid hormone, or some combination of the two.

Primary hypothyroidism (i.e., that not caused by therapies intended to decrease thyroid hormone production) is rare in cats, having been reported in approximately 70 cats in the veterinary literature. Most cats with primary hypothyroidism are kittens under 4 months of age (called congenital hypothyroidism), and many of these cases may develop dwarfism. The condition can, however, be diagnosed in adult cats.

The signs of feline hypothyroidism include increased thirst and urination, unkempt haircoat, weight gain, lethargy, poor appetite, and cold intolerance. Some cats with this condition may

develop an enlarged thyroid gland (goiter) that can be felt in the underside of the neck.

Primary hypothyroidism is diagnosed by documenting decreased levels of thyroid hormone and increased levels of thyroid stimulating hormone (TSH), a hormone that is produced by the pituitary gland that normally stimulates the thyroid gland to produce thyroid hormone. If treatment is required, this usually involves supplementation with synthetic thyroid hormone called L-thyroxine. Most cats diagnosed with this condition will require L-thyroxine supplementation for life.

The prognosis for adult-onset hypothyroidism is good with appropriate management. Unfortunately, kittens with congenital hypothyroidism may suffer from a variety of secondary health problems, and their prognosis is usually guarded. Some of these kittens may succumb to this condition. With ongoing research, though, it is hoped that outcomes in kittens with hypothyroidism can be improved.

I hope this helps, and please continue to work closely with your veterinarian to assure the best care for your cat. ■

© HAPPENING NOW ...

Generous Donation—When Norman Nolan passed away at age 95 in April, he left all his assets to the Cornell University Hospital for Animals, particularly to help those who can't afford the services their animals need. A longtime beloved visitor, he often brought treats to the vet school and hospital staff. A retired Navy gunner, he worked at the Naval ROTC at Cornell and fell in love with the university. Nolan owned many dogs and cats over the years. "His pets were his children, he adored them and got the best veterinary care he could get!" says Dr. Carol Hardy, a longtime friend and former senior lecturer in Biomedical Sciences. ■

Coming Up ...

- ▶ *When to Consider Fecal Transplantation*
- ▶ *Common Feline Autoimmune Diseases*
- ▶ *Upper Respiratory Infections*
- ▶ *Introducing New Members of the Family*



Do You Have a Health Concern?

Send your health questions to Bruce Kornreich, DVM, PhD, DACVIM, Director of the Cornell Feline Health Center and Editor-in-Chief of CatWatch. Email to catwatcheditor@cornell.edu or send by regular mail to CatWatch, 535 Connecticut Ave., Norwalk, CT 06854-1713.

