From periphery to perception: The pathway to pain
When treating four-legged patients, make each moment matter.

PNC can help.

We're making business banking easier.
At PNC, our team of dedicated Healthcare Business Bankers understands your business challenges and the important role that cash flow plays in your success. That's why we offer a range of solutions to help optimize management of your practice's revenue cycle and payables, so your business can run with less complexity and payments can be received promptly.

Learn more at pnc.com/hcprofessionals or by calling 877-566-1355

©2020 The PNC Financial Services Group, Inc. All rights reserved. PNC Bank, National Association. Member FDIC
From periphery to perception: The pathway to pain

Well-being
Fighting sleep deprivation (and winning!)

Medicine
Managing recurrent urinary tract infections

Personal & Practice Finance
Achieving your financial goals

Medicine
Hepatotoxicity in dogs and cats

Innovation
The rapid rise of veterinary telehealth

Technology
How to foil cybersecurity threats at your practice

Career
Tips for landing your first associate position

Medicine
Image Quiz: Hair loss in a Pomeranian puppy
HEALTH IS NOT JUST ONE THING. IT IS EVERYTHING.

Cats are curious, intelligent, and instinctual. To feed their complexity, you’ve always had Royal Canin’s line of tailored nutritional formulas. Now you’ll be able to offer products beyond nutrition, made to help proactively ease cat owners’ concerns. It’s part of a continuum of care for the healthy and not healthy—designed to meet the evolving needs of cats, their owners, and your clinic. For pets and vets alike, what it means to be healthy is changing. So are we.

Solutions for cats with every type of need, and for every practice.
my.royalcanin.com/vet/urinary
No doubt you’ve been jolted awake with that dreaded 2 AM call. You fumble for the phone, introduce yourself as professionally as you can with marbles in your mouth, and hear: “Hey, how do you tell if a dog is a boy or a girl?” Or worse, you lug yourself to the clinic for the frantic client who’s a no-show, and you’re left fuming and utterly incapable of falling back to sleep.

It’s no secret that many veterinarians suffer work-life imbalance—and sleep deprivation is a major contributor.

How much sleep do you need?
The National Sleep Foundation recommends 7 to 9 hours of sleep per day, a near impossibility for most veterinary practitioners. But those numbers are only half the story. What the body truly requires is restorative sleep, during which the brain cycles through all the sleep stages (1, 2, 3, 4, and REM) several times over. The magic happens during deep sleep (stages 3 and 4), which is rejuvenating and prepares you well for a day of challenges.

In each 8-hour period of continuous, healthy sleep, the body will ultimately compile 1 to 2 hours of deep sleep. Any interruption diminishes the body’s ability to function properly, with unhealthy alterations in hormone production, immune system regulation, and brain activity.

What exactly goes wrong?
When we don’t get enough sleep, the brain moves less learned information from the hippocampus to the neocortex, resulting in decreased memory processing and retention. In addition to diminished mental capacity (which was implicated in both the Exxon Valdez oil spill and the Chernobyl nuclear explosion), sleep deprivation causes a host of physical abnormalities.

The stomach produces more of the gastric peptide ghrelin (an appetite stimulant) and less leptin (a satiety hormone), increasing appetite and cravings for high-fat, high-carbohydrate foods once awake.

The pancreas releases higher levels of insulin after eating, overloading your fat storage and increasing your risk for type 2 diabetes.

The pituitary gland releases fewer growth hormones, thus inhibiting the body’s ability to repair tissue, increase muscle mass, thicken skin, and strengthen bone.

The adrenal glands produce more cortisol, increasing blood pressure and your risk for heart attack and death. Increased cortisol also breaks down skin collagen so you don’t look your best.

The body clears fewer circulating inflammatory cells and produces fewer natural killer cells and protective cytokines that aid in immune function.

Lack of sleep has long-term effects as well. Various studies on sleep deprivation (generally defined as 5 or fewer hours of sleep per night) have found that it:

- increases the risk for dementia by 33%
- doubles the risk for death from any cause
- increases the risk for colorectal cancer by 36%
- increases the risk for obesity by 50%

Got zzzz’s?
Fighting sleep deprivation in veterinary medicine

Not getting enough sleep diminishes our focus and is detrimental to our health and well-being. Here’s why, and what to do about it.

By Holly Sawyer, DVM
• triples the risk for catching a cold
• increases the risk for cardiovascular disease by 48%
• increases the risk for depression, anxiety, irritability, and forgetfulness.

**But caffeine is the great panacea, right?**

You know who has worse sleep deprivation than health professionals? The military. In fact, 40% of our troops get less than 5 hours of sleep, and that’s stateside. Their sleep plummets during combat. So the US military came up with an algorithm to determine how much caffeine one needs to stimulate wakefulness based on amount of sleep. Lest you all picket the Pentagon for the answer, the algorithm is still proprietary, but Uncle Sam has released a free app that gives general calculations for the average person.⁵

In the short term, caffeine may reduce how much you totter into walls, but it does nothing to immerse the body in that soothing stew of stages 3 and 4 deep sleep. None of the hormone imbalances self-correct with caffeine intake. All of the risks elucidated above remain. Worse, the more caffeine that is in your system, the more likely you are to perpetuate sleep deprivation through insomnia.

**How can we achieve sleep nirvana?**

Given that we’re not fruit flies (see *Insight from the animal kingdom*),⁶-⁸ we must master a few techniques to maximize our sleep:
• Sleep in a cool room (between 60 °F and 67 °F).
• Standardize the timing and activities of your presleep routine.

• Avoid eating heavy meals 2 hours before bedtime to minimize discomfort from gastric reflux.
• Avoid too much alcohol near bedtime because its breakdown products can interrupt sleep.
• Get up at the same time each morning, even on weekends and holidays.
• Exercise regularly, but not right before bedtime.⁹
• Avoid stimulants like caffeine and nicotine prior to bed. Recent research recommends a 2 PM cutoff for all caffeine products.¹⁰
• Take a warm bath or shower 1 to 2 hours before bedtime. The external warmth opens capillary beds in the periphery (limbs), ultimately lowering core body temperature, which improves onset and quality of sleep.¹¹
• Turn off all blue-light sources, including phone and computer screens, 1 to 2 hours before bedtime.¹²

**The moral of the story**

It’s simple: Get deep, uninterrupted, restorative sleep. One of the surest ways to achieve that in the veterinary setting is to have a competent, compassionate registered veterinary technician answer your after-hours calls for you. Internal data suggest that 75% of after-hours calls are non-emergent. By leveraging professional help to answer simple questions, generate next-day appointments, refer to the local emergency clinic, or call your phone for verified emergencies only, you can begin to take back control of your destiny…even when you’re asleep.

References available at dvm360.com

*Dr. Sawyer is a regional veterinary consultant for GuardianVets Teletriage and Telemedicine Services.*

**Insight from the animal kingdom**

As veterinarians, it behooves us to look to the animal kingdom for deeper insight into the importance of sleep. Granted, we are not sloths, requiring 18 hours of sleep per day. But all creatures great and small need sleep.

The first sleep deprivation study, performed on puppies in the 1890s by a Russian physician, proved that sleep is mandatory for survival. When kept awake continuously, every pup died within days.⁶ The lethality of sleep deprivation has since been confirmed in rats, cockroaches, and fruit flies.

To be fair, while fruit flies average 5 hours of sleep per day, a singular female paragon in one study snatched just 4 minutes of shut-eye per day without meeting a hideous end.⁷ (If only the US military could bottle that superpower…) As for the other insomniac heroes of the world, namely transoceanic migratory birds, more refined, kinder studies have nailed down the specific mechanism of their seeming sleeplessness. Electroencephalograms fitted to great frigate birds of the Galapagos verified the long-held assumption that they fly with one (and sometimes both) hemispheres of their brain asleep.⁸
How to manage recurrent urinary tract infections

Here’s what you need to know about treating uncomplicated UTIs and recurrent infections.

By Clayton Greenway, DVM, DACVECC

Urinary tract infections (UTIs) are commonly seen in veterinary practice. While treatment in certain patient populations is straightforward, UTIs can become challenging to manage when there are concurrent complicating factors.

Uncomplicated UTI
With a typical UTI, a queen (of the appropriate age) or bitch urinates small amounts frequently, seems uncomfortable (often in general, but specifically while urinating), and there appears to be blood in the urine. While a culture is still recommended in these cases (due to the rising prevalence of resistant microbes in the environment), a penicillin (e.g., amoxicillin) is a good empiric choice as it concentrates in the urine. A sulfa antibiotic is another good option. Other antibiotics (e.g., enrofloxacin, nitrofurantoin) should be reserved for recurrent cases. Sample collection via cystocentesis is preferred.

Recurrent UTIs
Managing recurrent UTIs can be complicated, largely because of antibiotic resistance. The first step in treating a recurrence is to rule out or mitigate other causative factors. Imaging for uroliths is important, as these will be a source of recurrence because they release previously protected bacteria back into the bladder.

Additionally, assessment of anatomy is important. Search for vulvar or ureteral abnormalities, both of which can contribute to UTI recurrence. In older patients, transitional cell carcinoma may predispose them to recurrent UTI. Metabolic disease, such as unregulated diabetes or Cushing disease, may also be at play. Without control of these conditions, the risk for recurrence is much higher, and controlling these conditions may end the cycle of recurrence.
Once concomitant factors have been mitigated, culture-based treatment is still the appropriate course of action. A slightly longer course of treatment is recommended for patients with recurrent UTI (5 to 7 days as opposed to the standard 3 to 5 days.) Several other preventive measures have been discussed, but few have been proven efficacious.¹ No positive effect was found with direct instillation of any substance into the urinary tract (antimicrobial or otherwise). Pulse antibiotic therapy was tested and not found to be particularly efficacious.²

One recommendation that has been found to be effective (in humans at least) is administration of cranberry extract.¹² There is also a fair amount of anecdotal evidence in both veterinary and human medicine to suggest its utility. The proanthocyanidin in the cranberry inhibits uropathogenic Escherichia coli adherence to the urinary epithelium, preventing an infection recurrence.²

### Other complicating factors

#### Subclinical bacteria

Another clinical complication of recurrent UTIs is the presence of subclinical bacteria, in which a patient’s urinary sediment is quiescent and there are no clinical signs of cystitis but the urine culture tests positive. There is strong evidence in human medicine that no treatment is warranted in these cases.³ Some exceptions include patients who are set to undergo any procedure in which bacterial contamination may be induced (e.g., urinary surgery in which hemorrhage may expose the bloodstream to urine).

#### Pyelonephritis

A more life-threatening complication of UTIs is pyelonephritis. Patients with this condition present with acute onset of systemic signs (e.g., lethargy, anorexia, vomiting) and are found to have new-onset azotemia. Direct diagnosis requires pyelocentesis (aspiration of the renal pelvis), but this is not commonly pursued due to the difficulty in performing this procedure. In a patient with new-onset azotemia who is clinically ill and has no toxin exposure consistent with the azotemia, pyelonephritis is largely assumed (because it is the most treatable cause of acute kidney injury) and treatment with antibiotics is initiated. (Keep in mind that this patient population completely overlaps with those suffering from leptospirosis, so appropriate testing and staff safeguards are important until this is ruled out.)

On ultrasound, pyelectasia (dilation of the renal pelvis) is suggestive of but not definitive for pyelonephritis. Ultrasound also helps to rule out other causes of acute kidney injury, such as obstructive ureteroliths, neoplasia, or ischemia. Patients with these conditions require hospitalization and varying levels of fluids and other supportive care. Antibiotic selection should be based on culture, but initial empiric treatment is important. Most commonly, a potentiated penicillin (ampicillin-sulbactam) with a fluoroquinolone is recommended. This is both for broad-spectrum coverage as well as good tissue penetration into the renal tissues with the fluoroquinolone. Prognosis in these cases is fair, although there will be some degree of permanent renal compromise that is not predictable at the outset.

### Final thoughts

UTIs are common, but complications are rare. Appropriate urine culture is the bedrock on which treatment should be based, both for best patient outcome and antibiotic stewardship. Contacting a veterinary microbiologist can also be helpful in guiding antibiotic recommendations.

References available at dvm360.com

A board-certified criticalist at Mount Laurel Animal Hospital in Mount Laurel, New Jersey, Dr. Greenway earned his DVM from Texas A&M University and is a proud member of the American College of Veterinary Emergency and Critical Care. He was truly inspired by his father, a military veteran, who fostered a deep commitment to animals. His professional interests include emergency (polytrauma, severe anemia) and critical care (septic case management).
For veterinary practice owners, professional and personal goals go hand in hand. Success in both is achieved through time, effort, discipline, and sacrifice—and a little professional guidance.

By Miles Saunders and Karen E. Felsted, CPA, MS, DVM, CVPM, CVA
For many people, personal and professional life goals are inter-twined, and this is certainly true for current and future veterinary practice owners. Reaching your personal goals often depends on having some level of financial freedom, which is only achieved when you reach your professional goals. If your goals include early retirement complete with travel and other luxuries (boats, vacation homes, etc.), then your professional goals will likely be more audacious than if you envision a more modest lifestyle and a later retirement.

The first step in helping improve your overall financial success is to decide (or update) what you want to achieve in your life and create a list of specific goals to get you there. Only once you consider the bigger picture can you begin to refine the details. One of these "details" for many veterinarians is practice ownership.

**Achieving personal financial goals**

The definition of personal financial success is different for everyone. Some people have an arbitrary number or scenario in mind that they believe they will achieve if they "grind" their way to the top. But working hard and blindly reaching for the stars may not be as successful as implementing a defined and disciplined investing and savings approach.

Many people either have no budget or have a budget that is not strict enough for them to improve their finances substantially. The fact is that realizing financial success will likely involve time, effort, discipline, and sacrifice. If you are willing to make tough decisions and take the time to plan the framework for your personal financial growth, then all that is left to do is execute your plans and begin to see the results.

One way to determine where to make cuts in spending is to categorize your goals as needs, wants, or wishes. Using this method allows you to see what you can do now and what will have to wait, giving you a broader understanding of what you are able to accomplish and when.

One of the best ways to create a disciplined budget is the "50/30/20" rule. This method dictates how much of your after-tax earnings you can allot for three types of spending:

- 50% is spent on your essential fixed costs and (e.g., rent/mortgage, groceries, utilities).
- 30% goes toward your wants (dining out and other discretionary spending).
- 20% flows right into savings/investing and paying down bad debt (credit cards, high-interest loans, etc.).

To make a real difference in your financial habits and bottom line, this 20% number is the "magic sauce" that, if allocated correctly, should get you into your desired position in due time.

**Achieving professional goals**

The value of a practice is realized by an owner when the practice is sold. Understanding what drives practice value and how to improve it is critical. There are two primary markets in veterinary medicine today in which a practice can be sold. The first is the historical market, which is when a practice is sold from one veterinarian to another veterinarian. The second is the corporate market, which is when a practice is sold to a corporate entity that owns numerous practices (and may or may not be owned by other veterinarians).

The amount buyers in each market are willing to pay varies, but the practice’s profitability is almost always the most important determinant of practice value. Whether you are 2 years or 30 years away from selling your practice, this is a critical metric to understand, yet most owners don’t know what that number is for their practice. Improving profitability not only will increase your practice’s value at the time of sale, it also will increase your cash flow during ownership.

**Determining your practice’s profitability**

Calculating the true operating profits of a practice is not a simple task. None of the standard financial or management reports a practice usually gets include this figure. Neither the taxable income from the tax return nor the net income from the profit and loss statement represents true profitability.

The operating profit is the difference between the operating revenue and the expenses a practice incurs. Operating revenue and expenses include only those items normally and necessarily seen in day-to-day practice operations, such as fees for professional services, and drug and medical supply expenses. These items should be listed at fair market values.

For ease of comparison with other practices, a hospital’s profit margin is generally stated as a percentage, which is calculated as practice profits divided by gross revenue. However, some items must be calculated differently to determine operating profit versus taxable income or net income. These include practice owner payments, facility and equipment rent (if these items are owned by the practice owner and leased to the practice), services provided by family members to the practice, depreciation, interest on debt, and perks. The resulting percentage is the true operating profit of the practice, and it is important to compare this percentage with...
other investments you have and with that of other practices. An operating profit of 20% or higher is considered superior, 12% to 13% is average, and less than 6% is poor. This all may sound a little daunting, but there are resources available to help. If you work with a veterinary financial adviser, this person should be able to calculate your profitability. VetPartners also offers resources to help guide you through this calculation process.

**Converting profitability into practice value**

Once the profitability figure is determined for a veterinary hospital, that number must be converted into the practice value via an appropriate capitalization rate (or cap rate). In practical terms, the cap rate is the required rate of return an investor needs in order to be persuaded to make an investment. There is no one correct rate for all situations—the rate is determined by the market and will vary depending on both external factors (e.g., the state of the economy) and internal factors (e.g., the level and quality of the company’s earnings, the amount of competition in the area). The rate is a reflection of the risks associated with owning and managing a veterinary practice, and continuing to generate the current level of profits. The inverse of the cap rate is a multiple; for example, if the cap rate is 20%, the multiple is 5 and the formula used to derive practice value is as follows:

\[
\text{Annual earnings} \times \text{Multiple} = \text{Practice value}
\]

\[$200,000 \times 5 = $1,000,000\]

To increase practice value, the management team needs to either increase profitability or decrease the risk associated with owning the practice (i.e., the risk associated with maintaining the practice’s current profitability).

A lack of profitability stems from revenues that are too low, expenses that are too high, or a combination of the two. Profitability can be improved in many ways, from increased marketing to better inventory control to improved team productivity.

A wide range of factors affects the risk related to owning a veterinary practice, including client demographics, the state of the facility, the quality of the management team, and the range of services offered, among others. Increasing practice value involves three steps:

1. Understand where the practice is doing well and where improvement is needed.
2. Put plans in place to drive change.
3. Monitor the success of those plans.

Working with a financial advisor or practice consultant may help not only in gaining a greater understanding of the issues impacting profitability but also in identifying and implementing solutions.

**Synergy between practice and personal financial goals**

It is very possible to have a thriving business and a personal financial state that has ample room for improvement and vice versa—the two are not mutually exclusive. However, having a well-organized personal financial life can impact how a practice is run, and a well-run practice sets the stage for a fruitful personal financial future. The common dominator between these two aspects of financial fitness is planning.

Miles Saunders owns and operates MNS Wealth Management LLC in Westport, Connecticut. He can be reached at miles@mnswealthmanagement.com.

Dr. Felsted has spent the past 20 years working as a financial and operational consultant to veterinary practices and the animal health industry. She served as CEO of the National Commission on Veterinary Economic Issues for 3 years. Dr. Felsted is active in multiple veterinary organizations, has written extensively, and speaks regularly at national and international veterinary meetings. She owns PantheraT Veterinary Management Consulting.
Collaborative Care From Every Angle

PetPro Connect™ is the world’s first Collaborative Pet Care platform. Built to keep you close to your pet patients and their families, our suite of agile communication and engagement tools will keep tails wagging and owners smiling.

Discover your angle at petproconnect.com
Hepatotoxin ingestion followed by acute liver injury/acute liver failure (ALI/ALF) is a common veterinary emergency presentation. As with any toxin ingestion, initial management includes early recognition, decontamination, supportive care, administration of antidotes when available, and hepatoprotective medications. Management of ALI/ALF, which is primarily supportive and aimed at treating complications that occur due to liver dysfunction, will be discussed in a separate article.

**Xylitol**

Xylitol is a naturally occurring alcohol commonly used as a sugar substitute. It is found in sugar-free chewing gum, candy, and peanut butter, as well as in some medications and baking products. The most immediate effect of ingestion is acute hypoglycemia due to an insulin surge up to seven times greater than would be stimulated by an equivalent amount of glucose. Signs related to hypoglycemia (i.e., lethargy, ataxia, seizures) typically present between 30 minutes and 12 hours after ingestion.

Hepatotoxicity generally occurs within 1 to 3 days. The minimum dose known to cause hepatic injury is 0.5 g/kg. The exact mechanism of hepatic toxicity is unknown but may be related to ATP depletion leading to hepatocellular necrosis and production of reactive oxygen species.

Two syndromes typically are seen with xylitol hepatotoxicity. The first, and more common in my experience, is a mild to moderate increase in hepatic transaminase activity that resolves with supportive care. The second, and much more serious, is idiosyncratic ALF.

Decontamination is often unrewarding given that xylitol is absorbed upon chewing. Activated charcoal will not bind to it. Treatment includes supportive care, glucose support, electrolyte balance, and hepatoprotective medications.

**Amanita mushrooms**

Mushroom toxicity can be challenging for the clinician, as the nature of toxicity is highly dependent on the species ingested, and it can be difficult to identify the species accurately even when the mushroom is available for examination. Mushroom ingestion may result in no signs, mild gastrointestinal (GI) signs, neurologic signs, or severe hepatic, renal, or multiorgan failure. Mushrooms are easily accessible to dogs and outdoor cats and their ingestion often goes unnoticed. Even suspected toxicity can be very difficult to confirm. Without knowing the exact species ingested, medical recommendations must be made based on the “worst-case scenario” ingestion, frequently resulting in hospitalization and treatment for potential hepatotoxicity as a precaution.

The most concerning species causing hepatic failure is the *Amanita phalloides* ("death cap") mushroom. These mushrooms are native to Europe but can be found throughout North America, most commonly in the Pacific Northwest or northeastern United States. *A. phalloides* mushrooms contain several toxins, with amanitin being the most clinically important. Following ingestion, rapidly dividing cells (usually GI crypt cells, hepatocytes, and renal tubular cells) are typically the most affected. The clinical course has four phases: An asymptomatic phase lasts for 6 to 24 hours, followed development of GI signs, then a false recovery that lasts hours to days and often results in delayed treatment and, finally, quick progression to ALF and the potential for acute kidney injury. At this stage, dogs present with severely elevated liver enzymes, coagulopathies, and potentially severe hypoglycemia and azotemia.

Treatment is largely supportive with specific recommendations made for the use of penicillin G and silymarin. Silymarin competes with amatoxins for transmembrane transport and inhibits the penetration of amanitin into hepatocytes, thus having a direct hepatoprotective effect. Penicillin G is believed to have a similar mechanism of action, displacing amanitin from binding to plasma proteins and thus promoting its excretion and preventing its uptake by the liver. Ultimately, the prognosis for patients who develop ALF is grave.
**Acetaminophen**

Acetaminophen ingestion can result in direct dose-dependent hepatotoxicity. With acute overdoses, the glucuronide and sulfate conjugation system becomes saturated, leading to increased production of NAPQI (N-acetyl-p-benzoquinone-imine). NAPQI begins to accumulate in the hepatocytes, resulting in hepatic damage and ultimately ALI/ALF.

In dogs, doses higher than 100 mg/kg can cause hepatotoxicity. The exact hepatotoxic dose for cats is unknown, but it is much lower than in dogs, potentially as low as 10 mg/kg. This is due to the lack of a specific form of glucuronoyl transferase that is required to conjugate acetaminophen to glucuronic acid, with the sulfate-conjugating mechanism being much less effective in cats than in dogs. Evidence of hepatotoxicity typically occurs within 24 to 36 hours. Acetaminophen may also result in the development of methemoglobinemia and Heinz body anemia.

The antidote for hepatotoxicity due to acetaminophen involves replenishing glutathione stores using N-acetylcysteine (NAC) or S-adenyl-L-methionine (SAMe). NAC administration is preferred, the protocol for which involves an initial intravenous loading dose of 140 mg/kg followed by 70 mg/kg intravenously every 6 hours for seven total treatments. SAMe can be given concurrently and continued orally following administration of NAC.

Acetylcysteine comes as a 10% or 20% injectable solution. When given intravenously, it must be diluted to 5% with saline or dextrose 5% in water, and given through a filter. NAC may also be administered orally, diluted to a 5% solution, for ease of administration in hospital or at home for outpatient management. I often use Gatorade as the diluent when administering orally to dogs. Treatment is otherwise supportive and is also directed at managing methemoglobinemia/anemia.

**Sago palm**

Sago palms (*Cycas revoluta*) are found in subtropical/tropical climates such as the southeastern United States, Caribbean, Central America, East Asia, and Africa. In non-native areas, they are commonly encountered as decorative houseplants and generally sold without warning of their potentially severe toxicity. The primary toxin, cycasin, can be found in all parts of the plant. Initial signs are nonspecific and typically GI related. Hepatic damage can occur within 24 to 72 hours of ingestion. Patients may develop neurologic signs, including seizures, depression, ataxia, and tremors. Treatment is supportive with a grave prognosis if liver failure develops.

**Blue-green algae**

Toxic algal bloom is seen most commonly in shallow, stagnant water during hot weather. It may have the appearance of a pea green paint or slime on the surface of the water and may concentrate at the water’s edge where animals tend to drink. Overgrowth of cyanobacteria can result from high levels of nitrogen in water following flooding or heavy rains causing runoff. Cyanobacteria can produce microcystin toxins that result in hepatic failure. Microcystins disrupt the hepatocyte skeleton leading to hepatic necrosis. Neurologic signs and hepatotoxicity can develop within hours of ingestion. Decontamination includes immediate bathing to remove algae from the haircoat, as well as emesis and activated charcoal administration if the pet is not experiencing neurologic signs. Treatment is otherwise supportive with a grave prognosis if liver failure develops.

**Drug reactions**

Many medications have been implicated in causing ALI/ALF. Drugs can be predictable, dose-dependent toxins such as acetaminophen, phenazopyridine, phenobarbital, azole-antifungals, and azathioprine. Many drugs are idiosyncratic liver toxins that are not dose dependent, and toxicity is unexpected based on their normal metabolism. Examples include carprofen, lomustine, zonisamide, oral benzodiazepines (cats), and sulfonamide antibiotics.

Treatment involves discontinuing the inciting medication, providing supportive care, and administering hepatoprotective medications. Recovery from ALI is possible in many cases after discontinuing the medication. If the patient progresses to ALF, the prognosis becomes much worse.

References available at dvm360.com

Dr. Taney earned his VMD from the University of Pennsylvania School of Veterinary Medicine, after which he completed a 1-year small animal medicine and surgery internship at Tufts University. He is a proud member of the Veterinary Emergency and Critical Care Society, AVMA, and New Jersey and Pennsylvania Veterinary Medical Associations.
The word pain comes from the Latin poena, meaning penalty or fine,” began Mike Barletta, DVM, MS, PhD, DACVAA, during a recent Fetch dvm360 conference session. “It’s like you did something to your body, and now you’re going to pay the consequences.”

Pain is, of course, much more nuanced than its origin implies. According to Dr. Barletta, an associate professor of anesthesia at the University of Georgia College of Veterinary Medicine, pain can be either physiologic or pathologic:

- **Physiologic pain**, also called acute adaptive pain—the kind that prompts you to pull your hand away when you touch a hot stove—can prevent injury and even promote healing after injury.
- **Pathologic pain** refers to chronic, maladaptive pain, which Dr. Barletta described as “an expression of the pathologic operation of the nervous system that can follow acute pain if not prevented or treated.”

For Dr. Barletta, treating pain starts with an understanding of its anatomy and physiology, beginning with the difference between nociception and pain, followed by the five steps in the pain pathway: transduction, transmission, modulation, projection, and perception. With this foundation, the drugs to use for each step and why become more clear.

**Pain versus nociception**

“Nociception is everything that happens before a noxious stimulus reaches the cerebral cortex,” explained Dr. Barletta. “It includes the periphery, nerves, and spinal cord—everything up to the cortex. Once that stimulus is processed by the cortex and the organism becomes aware of it, we start calling it pain.” Transduction, transmission, modulation, and projection are thus part of nociception. Pain occurs at the point of perception.

**Transduction**

The first phase in nociception, called transduction, occurs in the periphery and involves special receptors called nociceptors. “These nociceptors are the peripheral end-terminals of A6 and C fibers,” explained Dr. Barletta. “Mechanical, thermal, and chemical stimuli open different potassium and sodium channels located at the end-terminal of these nerve fibers to activate transduction, in which energy is converted from one form (which can cause tissue damage) to another (an electrical impulse).” If transduction isn’t prevented or treated, he continued, tissue damage will cause the release of inflammatory mediators (histamine, bradykinin, tumor necrosis
Treating pain starts with an understanding of its anatomy and physiology, beginning with the difference between nociception and pain, followed by the five steps in the pain pathway.

factor-alpha, interleukin-beta, interleukin-6, nerve growth factor, adenosine, hydrogen ions, adenosine triphosphate, and prostaglandin E2) that can bind to peripheral receptors and recruit more inflammatory cells, resulting in peripheral sensitization. Dr. Barletta referred to it as “inflammatory soup.”

According to Dr. Barletta, these inflammatory mediators can activate nociceptors that are usually silent to cause hyperalgesia (an overreaction to a painful stimulus) and allodynia (a painful reaction to a nonpainful stimulus, like touch). They also decrease
the threshold for some receptors. “TRPV1 receptors are a really big deal in pain and usually have a temperature threshold of 45 °C (113 °F), which means you’re going to start feeling that a stimulus is really hot and painful when it’s at 42 °C,” he explained. “Now that decreases to 35 °C (95 °F). If you’ve ever had a bad sunburn, for example, bathing in lukewarm water can feel super hot—like it’s burning your skin.”

**Ultimately, pain is a multimodal problem requiring a multimodal plan for prevention and treatment.**

Transduction can be prevented with local anesthetics, opioids, nonsteroidal anti-inflammatory drugs (NSAIDs), and corticosteroids. “Local anesthetics block sodium channels, which is one of the reasons why we use local blocks when performing surgery,” Dr. Barletta noted. “As for opioids, most research findings concur that we have mu receptors in the periphery, and NSAIDs and corticosteroids decrease the inflammatory response.”

Dr. Barletta said he often gets asked whether animals should always be pretreated before a stimulus is applied. His response: “Ideally, yes. We definitely provide a local anesthetic and administer opioids before that.” Whether to give NSAIDs before surgery is a common conundrum, continued Dr. Barletta. “If I want to prevent pain, I should probably give as much as I can before the stimulus, but at that point I don’t know how the surgery and anesthesia event are going to go down,” he elaborated. “What if the patient is going to be hypotensive for most of the surgery and now maybe its kidneys aren’t well perfused, and then I’m giving an NSAID on top of that? Those kidneys won’t be very happy.”

He explained that there are two options to choose from here: “Some say you should always wait to give NSAIDs until after surgery because you never know what’s going to happen. However, I’ve seen someone spay a healthy cat in 2 minutes. The animal doesn’t even have time to develop hypotension in 2 minutes, so in this situation it’s probably OK to administer NSAIDs before surgery.” However, he continued, if you’re performing surgery on an animal that’s pretty sick, such as a dog with hemobdomen, it’s highly likely you’ll have to deal with hypotension. So, here’s Dr. Barletta’s rule of thumb on the matter: “If the animal is young and healthy and it’s a routine procedure, I don’t have any problem administering an NSAID before surgery. If it’s a critical patient, I’m probably going to wait until postop, as long as everything goes smoothly and pressures are fine.”

**Transmission**

“After the nociceptors are stimulated in the periphery during transduction, the electrical signal travels to the dorsal horns of the spinal cord through the nerve fibers—Aδ, C, and (in chronic pain) Aβ fibers—via sodium, potassium, and calcium ion channels in a process called transmission,” Dr. Barletta said. “Aδ fibers synapse in lamina I-V of the spinal cord and C fibers in lamina II, which is also referred to as the substantia gelatinosa.” (See **Nerve fibers explained**.)

To block nociception during transduction, Dr. Barletta recommends local anesthetics, which primarily block sodium channels. “Interestingly,” he added, “alpha-2s can potentiate the local anesthetic effect, and some studies have shown that when you add dexmedetomidine to your local anesthetic it increases the duration of your local block. Buprenorphine does the same thing.” When asked if he has a preference between dexmedetomidine and buprenorphine, Dr. Barletta explained that he prefers the former for economic reasons: “Buprenorphine is going to be more expensive. Dexmedetomidine is expensive, too, but the volume you use is very minimal, so you’re not actually spending that much money.” He does, however, make an exception if the patient is sick enough that he doesn’t think it will handle systemically administered dexmedetomidine.

**Modulation**

Modulation occurs in the periphery, spinal cord, and supraspinal structures. Focusing on spinal modulation, Dr. Barletta explained that the response to peripheral nociceptive stimuli can be modified in the spinal cord by the release of local endogenous modulators and the activation of descending pathways. Opioids, serotonin, and norepinephrine, for example, can decrease the response to nociception, while glutamate, substance P, and prostaglandins can increase it. And when the response to nociception is enhanced, central sensitization can occur. “This can be the result of brief but intense nociceptor activity, such as a surgeon cutting through skin, or of inflammation and nerve injury,” he continued. “Over time, repeated impulse activity of C fibers, release of a variety of neurotransmitters by the Aδ and C fibers, and activation of N-methyl-D-aspartate (NMDA) receptors can cause central sensitization resulting in enhanced responses to impulses (e.g., hyperalgesia, allodynia).”
The presence of glutamate together with the depolarization of the cell membranes (which displaces Mg$^{2+}$ from the channel itself) in the dorsal horns activates normally dormant NMDA receptors. “This should ring a bell here,” Dr. Barletta paused to explain, “because there’s a drug we use every day in anesthesia that’s an NMDA antagonist: ketamine. Does it help prevent chronic pain? Unfortunately, that’s a hard study to set up. How can I really show that? Using it seems to make sense, but it unfortunately doesn’t work that well when used to treat chronic pain. Its relief is very temporary.” Another unfortunate fact is that once these NMDA receptors are open and activated, it’s really hard to shut them down. This is one of the many theories that try to explain phantom limb pain, Dr. Barletta added. “You can remove the affected limb, but in the spinal cord all of this is still active. Neurons keep going into the dorsal horn where they release neurotransmitters that activate these NMDA receptors. The signal goes to the brain, and the cortex still thinks it hurts. That’s how nasty chronic pain is.”

Dr. Barletta noted that the downregulation of GABAergic and glycine receptor activity and the activation of microglia also occur during central sensitization. “All of this mimics what happens in the periphery for peripheral sensitization,” he said. “The microglia become activated and do exactly the same thing as white blood cells in the periphery—they start releasing interleukins, tumor necrosis factor, etc.—and all of this will recruit more microglia and it will just keep going on and on and you end up with this windup, or central sensitization.”

According to Dr. Barletta, NMDA antagonists, local anesthetics, opioids, alpha-2 agonists, and NSAIDs all work in the dorsal horns. He also noted that, while not often used clinically, antidepressants and anticonvulsants are used for the purpose in research settings.

**Nerve fibers explained**

**Aδ fibers**
The myelinated Aδ fibers are thick (1-5 μm in diameter) and conduct impulses at a rapid rate (5 to 30 m/sec). “They have a small receptive field and are responsible for sharp, fast, transient, localized pain,” Dr. Barletta explained. “They can be either unimodal, in which they transmit only one type of signal (either mechanical or heat), or polymodal, meaning they transmit more than one type of signal (both mechanical and heat).” Aδ fibers are predominant in the skin, which is why you can localize pain pretty well when, for example, you cut your own finger.

**C fibers**
The unmyelinated C fibers are thinner (0.25-1.5 μm in diameter) and conduct impulses more slowly (0.5 to 2 m/sec) than Aδ fibers. “Their receptive field is larger, and they’re responsible for the slow, diffuse, burning, gnawing sensation of second pain, which persists after a noxious stimulus is terminated,” Dr. Barletta said. “All C fibers are polymodal (mechanical and heat; mechanical and cold; and mechanical, cold, and heat).” C fibers are predominant in the viscera, which is why the pain from a stomachache can be difficult to pinpoint.

**Aβ fibers**
“In normal circumstances,” Dr. Barletta explained, “the myelinated Aβ fibers, which have a fast conduction velocity and a diameter ranging from 5 to 15 μm, are responsible for transmitting touch and pressure. But during chronic or pathologic pain, wide dynamic range neurons become activated and cause these fibers to start conveying signals as nociception instead of proprioception.” This changeup is caused by peripheral sensitization and central sensitization (also known as windup).

**Projection and perception**
“Projection,” explained Dr. Barletta, “involves the transport of the electrical signal from the spinal cord to the supraspinal structures.” Three main large tracts are involved: the spinothalamic tract (from lamina I-V to the thalamus), the spinoreticular tract (to the reticular formation and thalamus), and the spinomesencephalic tract (to the midbrain).

Once the electrical impulse reaches the cerebral cortex, it’s perceived as pain. Some of the drugs Dr. Barletta points out for blocking pain perception may seem strange, such as isoflurane and sevoflurane. “They’re not analgesic drugs,” he explained. “They act at the cortex, minimizing or stopping the perception of pain, but they’re not doing anything with nociception. That’s why if you’re anesthetized just with inhalants, I can perform surgery without you feeling anything, but nociception is still happening. So as soon as I turn the gas off and you start waking up, you’re going to be miserable.” Other drugs that work in the cerebral cortex include opioids and alpha-2 agonists.

**Make it multimodal**
Ultimately, pain is a multimodal problem requiring a multimodal plan for prevention and treatment. Dr. Barletta put it this way: “Multimodal analgesia is the idea. We’re trying to block or, even better, prevent these pathways at different locations and with different drugs to decrease the chance of creating chronic pain.”
Nobody saw COVID-19 coming. It didn’t take long for conditions to escalate and for veterinary clinics all over the country to shift from having a bright outlook for the start of a brand-new decade to dealing with some of the most crippling business challenges they have ever faced.

Fortunately, a majority of the industry has been quick to course-correct, finding ways to continue serving clients while also complying with social-distancing protocols, including offering curb-side care and medication pickup, and collecting patient histories electronically before appointments. But nothing tells the story of how veterinarians quickly adapted to changing protocols and consumer demands than the rapid adoption of telehealth during the pandemic.

This article explores the sudden spike in veterinary telehealth use, the long-term outlook of the trend, and what practice owners need to be doing in tandem with these changes to propel their practices forward.

**COVID-19: The catalyst for growth**

Over the past decade, considerable advancements have been made in telemedicine, yet health care providers and consumers alike have been slow to adopt this trend on a large scale—and the veterinary industry is no exception. The authors of a December 2019 survey study reported “a lack of both knowledge of telehealth and telemedicine and its utilization among veterinarians surveyed.”

Soon after this study was published, COVID-19 completely shifted the momentum. Veterinarians who might have otherwise been slow or resistant to try telemedicine were suddenly thrust into a situation in which they needed this tool to continue serving their clientele.

Telehealth platform Medici reported a 48% increase in overall veterinarian registration in March and a 170% increase in pet telehealth consultations month over month. Industry experts say this trend is likely to stick around even after the pandemic has ended, especially as clients become accustomed to the convenience of remote appointments.

Of course, the accelerated growth of telehealth in veterinary practice would not have been possible if state and federal governments had not eased certain restrictions, due to COVID-19, that typically exist for veterinarians.

**A changing regulatory landscape**

In response to the coronavirus crisis, the Food and Drug Administration announced in March that it would temporarily suspend enforcement of certain aspects of the laws surrounding veterinary telemedicine to make it easier for veterinarians to treat animals during the pandemic. Specifically, the agency decided to overlook the rule that requires veterinary clinicians to establish the veterinarian-client-patient relationship (VCPR) through in-person examination before prescribing medications and issuing feed directives through remote consultations. Temporary relaxation of this requirement made it easier for clinics to treat animals remotely during the pandemic.

The pandemic has also left state veterinary boards reexamining their requirements on telemedicine. Some states are temporarily adjusting their own VCPR and other requirements for veterinary telemedicine, while others are standing by previous standards. In addition, some state veterinary associations have been finding ways to expand the telehealth resources available to their members. For example, the New York State Veterinary Medical Society has partnered with TeleTails to be its exclusive virtual care platform, and the Washington State Veterinary Medical Association has partnered with the veterinary telehealth service Petriage.

Although it is unclear how long the federal and state governments will continue to loosen their restrictions in response to COVID-19, the fact is that the industry and world at large are starting to see what regulatory circumstances may be more conducive to the practice of telemedicine by veterinary care providers. Not only does veterinary telehealth help bridge the gap in care during challenging times like the pandemic, but it also provides a higher level of convenience for pet owners, as well as potential time and cost savings for practice owners.
That being said, it is possible we are headed into a future that encourages veterinarians to offer telehealth services, whether through fewer regulatory restrictions (for states that may decide to change their policies permanently), increased education, improved access to telehealth platforms, and/or partnerships. These factors could help make telehealth more of a mainstay with fewer barriers to adoption, similar to what we see in the human health care sector.5

What it means for your practice
The key point to remember is that telehealth is not going away. So, it’s important to think about how this aspect of care fits into your long-term practice plan and begin adjusting your business and marketing strategies accordingly. Here are three tactics to keep in mind when designing your telehealth business model.

Offer telehealth services.
The COVID-19 climate has given veterinary clinics the chance to get their feet wet with telehealth, laying the foundation to make it a part of their permanent business models. Even after all shelter-in-place and social distancing orders are lifted and veterinary clinics have resumed normal business operations, many will continue offering telehealth services, so you will want to be a practice that is ahead of the curve. Offering telehealth enables you to provide more convenient options for patient care, making you that much more desirable as a choice for veterinary services.

Start by researching the guidelines for telehealth in your state, and look for a platform that can help you streamline your virtual consultations for various types of electronic communications, from videoconferencing and telephone calls to text and email communication.

Promote your telehealth services.
Never assume current or prospective clients know about your telehealth services. Instead, use a variety of online channels to inform them about these services and how they can get started.

Make this service offering highly visible on your website by featuring it on your homepage. If your site has an FAQ page, be sure to include information about your telehealth services there as well. You can also share details on social media, in emails and phone calls to clients, on your blog (sharing the general benefits of telehealth for veterinary care), and elsewhere.

Create telehealth-focused ads.
If you’re running pay-per-click ads on a search engine (e.g., Google, Bing), you may want to consider using keywords (e.g., telehealth vet, telemedicine vet) that potential clients might use when searching for a clinic that offers virtual veterinary care. You can also highlight your telehealth services in other advertising campaigns, such as display ads you run on social media. By taking these extra steps, you can be discovered by pet owners who are seeking more convenient methods of care for their pets while maximizing your exposure and driving more business to your practice.

Looking ahead
As we move toward the end of 2020, it’s time to think about how you may need to adjust your business model to account for changing trends and new client expectations. As the conversation and climate surrounding veterinary telemedicine and technology continue to evolve, so should your strategy. Make sure your practice is prepared.

References available at dvm360.com

Andrea De La Cerda, who leads Scorpion’s strategy for the medical team, enjoys educating practice owners about digital marketing solutions designed to grow their businesses. She has worked with over 100 organizations to create stronger brands, evaluate the latest online strategies, and create solutions for clients that help them stand out in the market, attract top talent, and drive revenue.
Three simple steps to ramp up your veterinary practice's online security.

By Clint Latham, JD

HOW TO foil cybersecurity threats at your practice
There is no denying that the web browser has become the new operating system for many veterinary practices. With increasing use of cloud-based practice management software systems, many veterinary hospitals now rely nearly 100% on web browsers to access and manage their confidential data. From a technology management perspective, this is great because the use of cloud-based software reduces dependency on local hardware. However, it also increases the practice’s web presence and thus its exposure to growing cybersecurity threats.

Here are three recommendations to help you mitigate your practice’s exposure to malware and other cybersecurity threats.

1. **Use strong passwords, and store them in a password manager.**
   
   Most individuals and businesses get hacked because they have predictable or previously compromised passwords. The most commonly required (and most commonly hacked) password format is one that includes at least one upper-case letter, one number, and one symbol. Most people creating this type of password simply capitalize the first letter of a common word, followed by the number 1 and an exclamation point at the end (e.g., Welcome1!).

   This is a perfect scenario for a hacker. By using social engineering or a single crafty email, they will be able to obtain the password and, to make matters worse, add the password to black-market lists, allowing numerous hackers to automate the hacking process with little to no effort.

   When creating a password, avoid using personal information (e.g., birthdays) and common words (e.g., password, house), and be sure to use different passwords for different accounts. Here are a few tips for setting a secure password:
   - Use a mix of different character types (numbers, symbols, and upper- and lower-case letters).
   - Include two or more random words or nonsense phrases.
   - Think of a word or phrase, and then substitute the letters with numbers and special characters and mix the case (e.g., dogsandrhinos becomes DOgz&rh1n0z).
   - The longer your password is, the harder it will be to crack, but be sure it’s one you can remember.

   A great tool for your practice’s database is a password manager. A password manager (e.g., 1Password or LastPass) assists with generating and managing your passwords—the first step to healthier internet security.

2. **Keep software updated.**
   
   The simplest step you can take is to keep your operating system, web browser, and software up-to-date. This includes all PCs, laptops, tablets, and smart devices. These updates include important security updates to protect your private information. Keep in mind, hackers only need to find one way in. Meanwhile, we are challenged with finding all possible entry points and with finding the time to perform the updates. Schedule software updates to minimize their impact during practice hours.

3. **Enable two-factor authentication on all critical accounts.**
   
   For accounts that are mission critical, such as your practice’s email, bank, and QuickBooks accounts, make sure you enable two-factor authentication so that when you sign in, you receive and must enter a one-time code to access the account. This code can be generated through an app like Authy or through a text message that gets sent directly to your device. Using this feature saved me last year from a potential cybersecurity threat.

   While traveling to a practice, I arrived at the airport and opened up my laptop to check my email. I had been working on some Health Insurance Portability and Accountability Act (HIPAA) compliance issues for a colleague in human medicine and had received an email from the HIPAA auditor that looked authentic. The email indicated that the auditor needed to share a confidential document with me via Microsoft SharePoint.

   This was a legitimate process, something I would do frequently. However, there was one big clue that gave the hacker away: When I logged into this fake Microsoft SharePoint account, I wasn’t prompted to enter my two-factor authentication code, which was odd considering I had it enabled on my business email account. I was then redirected to a seemingly legitimate government form about HIPAA. I thought it was strange that he would password encrypt this document, but before I could investigate why, I started getting two-factor authentication requests from my email account—someone in Pakistan was trying to log into my account.

   Because I had enabled two-factor authentication, I prevented this attempted breach. I then used my password manager to update and generate a new password and moved on. If I hadn’t enabled two-factor authentication on my account, I would have been hacked—granting the hacker access to sensitive material and risking excessive damage to my account. The best way to protect ourselves is to have the right tools in place to cover our tracks.

   Clint Latham is the founder of Lucca Veterinary Data Security, which aims to help practices maintain online security.
PRACTICES FOR SALE OR LEASE

Practice Sales, Valuations, Associate Buy-Ins, Corporate Sales, & Buyer Representation. FREE Practice Appraisal in just 2 weeks! Contact Rebecca Robinson Davis, CBI, at 912-268-2701 or Hello@practicesalesadvisors.com. See our national listings at @www.practicesalesadvisors.com.

NC NEW! GOLDSBORO - Dream Facility, Grossing Approximately $1.2 Million, Progressive and Highly Efficient.
NC SOLD! LUMBERTON Area - Grossing $1.5 Million, Corporate Sale.
AZ NEW! Central Arizona - Grossing Over $1M, Option to Purchase or Lease Real Estate.
GA NEW! PERRY Area - Grossing $800K+, Real Estate & Practice Sales Price Only $700K!
GA UNDER NEGOTIATION! CUMMING - Newly Remodeled, 4 Exam Rooms, Busy Commercial Area.
GA East of Atlanta - Charming Facility, Knowledgeable Staff, Loyal Clientele.
GA UNDER CONTRACT! South of Atlanta - Grossing Approximately $1 Million, Seeking Corporate Buyer.
SC UNDER NEGOTIATION! GREENVILLE - Grossing Approximately $1 Million, Prime Commercial Location.
SC UNDER NEGOTIATION!
COLUMBIA Area - Solo Doctor Practice, Charming Facility, 1.3 Acres of Property.
FL NEW! CENTRAL FLORIDA Area - Attached Living Quarters, Grossing $700K, $75K Upgrade Allotment at Closing!
FL NEW! UNDER CONTRACT! EMERALD COAST Area - Specialty Practice, Owner Willing to Stay On, Corporate Sale.
FL SOLD! Siegel-TLC Animal Clinic - Grossing $750K+, Leased Facility.
NM PRICE REDUCED! SANTA FE Area - Small Animal Practice, Seller Motivated!
NY PRICE REDUCED! SOUTHERN NY-Solo-Doctor, Real Estate in Prime Condition!
TN KNOXVILLE Area - Sales Price $100K Lower than Appraised Value.
**Medical Equipment**

- **Son-Mate II Scaler / Polisher**
  - Sale Price: $1,825

- **A.D.S. 2000 Anesthesia Machine / Ventilator**
  - Sale Price: $5,795

**Anesthesia Equipment**

- **Engler Scale-Aire**
  - High Speed Veterinary Dental Air Unit
  - 360,000 RPM high speed drill
  - 20,000 RPM low speed H.P.
  - Built in 25K ultrasonic scaler
  - Auto-tune circuitry
  - Air water syringe
  - On-Demand Compressor (MF)
  - H-Frame mobile stand
  - Built in water reservoir
  - Switching power supply
  - Automatic handpiece activators
  - Lifetime loaner service
  - Proudly made in the USA

- **NEW**
  - $4275

**Engler Engineering Corporation**

- Proudly made in the U.S.A.

**In Business Since 1964**

- 6 year warranty on Son-Mate
- 1 year warranty on Scale-Aire
- 2 year warranty on A.D.S. 1000

**Address:**

- **1099 East 47th Street - Hialeah, Florida 33013 USA**
- **800-445-8581 / FAX 305-685-7671**
- **www.englerusa.com / www.engler411.com**

**Get your message to veterinarians TODAY!**

---

**Animal Arts**

- Architecture
- Animals
- People

**Contact Information:**

- **800.332.4413**
- **www.animalarts.com**
Congratulations, veterinary school graduates! If you haven’t yet started searching for your first associate position, now’s the time. Eric Miller, senior specialist of talent acquisition at Banfield Pet Hospital, offers tips to help you land the perfect job.

Do your research
Before you apply for any position, Miller advises, do your research. Knowing what you are looking for in terms of hospital size, location, culture, work-life balance, and other factors will lead you to the practices that are right for you. Look for as much information as you can find about each hospital’s health benefits, policies, onboarding, staff levels, schedule flexibility, mission and goals, and future opportunities.

Your cover letter and resume
“You should always attach a cover letter unless the job specifically says not to,” Miller says. Your cover letter should be broken into three paragraphs. But first, make sure all of your contact information is correct. “If we can’t get a hold of you, we can’t interview you,” Miller says.

The first paragraph should include your name, the name of the hiring practice, and the position for which you are applying. Customizing this section of the cover letter you shows that you are interested specifically in this position in this hospital.

The middle section is where you really get to showcase any achievements or experience that makes you a good fit for this role. Highlight anything that will help you stand out from other applicants.

In your closing paragraph, mention again your interest in the hospital and how ready you are for the position.

Like your cover letter, your resume must be up to date. And be sure to include your name in your phone’s outgoing message so a recruiter or hiring manager will know they have reached the right person.

Avoid nonessential “filler” information on your resume. “If you’re applying for a role as a veterinarian, we probably know you’re really good with clients,” says Miller. Instead, mention your achievements, such as volunteer work, research, publications, and successes from previous jobs. This is the type of information that makes you stand out, he says.

Finally, reach out to the employer or recruiter when you submit your resume to reiterate your interest in working at the practice. Another option: reach out to practices that aren’t actively hiring. They might just think of you when they are.

The interview
Before the interview, whether it’s on the phone or in person, learn as much as you can about the practice, and prepare questions to ask during the interview. This shows employers you are very interested in the job.

For in-person interviews, Miller recommends bringing five copies of your resume because you never know who you will run into. “It would be better for you to return home with four resumes rather than be short one when you need it,” he says.

When the interview ends, politely ask about next steps. And be sure to follow up with a thank you note or email restating your interest in the position. If they give you a timeline for when to expect someone to reach out and it does not happen, follow up.

If you are passed over
Be sure to send a thank you note anyway, and let the practice know if you are open to other positions that may become available. Also consider asking why you didn’t get the job. Any feedback may help your interview process in the future.

If you receive an offer
If you receive an offer, Miller recommends taking a few days to consider it, and reach out to the recruiter or employer with any specific questions you have. Let them know when they can receive an answer.

Miller says it’s OK to negotiate at this point, just be prepared that the practice may not accept your counter-offer.
A 2-year-old female, spayed Pomeranian had no previous history of skin disease but started losing hair at 1.5 years of age. There is no evidence of either a bacterial or yeast infection based on cytology or of pruritus associated with the skin condition. The only medication administered was oral melatonin (3 mg twice daily) for several months before presentation.

Answer: C. Alopecia X

All the answers should be on your differential diagnosis, but the most probable cause of the lesions is Alopecia X. A full history and dermatologic exam will help determine what is going on. Clinical signs vary from a dull haircoat to progressive alopecia and hyperpigmentation in adult dogs. Most commonly affected breeds are the Pomeranian, Samoyed, Alaskan malamute, Siberian husky, chow chow, and keeshond. The head and feet are usually spared. The most common system is the skin, but other systems may be affected. Alopecia X is a cosmetic disease that leads to a noninflammatory alopecia. Further blood testing (e.g., thyroid function, pancreatic, renin, and adrenal) will help determine whether further blood work will help determine whether a diagnosis of Cushing or hypothyroidism is made. The final diagnosis of Alopecia X is made by ruling out all other possible causes.

Alopecia X is a noninflammatory disease that leads to a noninflammatory alopecia in adult dogs. The pathogenesis is not confirmed, but possible causes include abnormal adrenal steroid intermediate compounds and/or sex hormones. Alopecia X is a cosmetic disease that leads to a noninflammatory alopecia. Further blood testing (e.g., thyroid function, pancreatic, renin, and adrenal) will help determine whether a diagnosis of Cushing or hypothyroidism is made. The final diagnosis of Alopecia X is made by ruling out all other possible causes.
MRI YOUR WAY
Vet Design | High Quality | 99% Uptime

Based on our unrivaled success in the equine market, our Small Animal system is specifically designed with the veterinarian’s needs in mind.

- High-field, 1.5 Tesla magnet
- 99% Uptime guarantee
- Lifecycle support
- Flexible financing options
- No room shielding required
- Vet-specific coils and protocols

We speak Vet at Hallmarq.net
info@hallmarq.net | 978.274.0433