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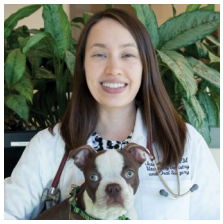
DENTISTRY



A Brief Guide to Conscious Oral Examination

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Dental disease affects the majority of our veterinary patients; however, it can be easily overlooked. Much of dental and oral disease cannot be detected without an anesthetized exam. It can be difficult to demonstrate to an owner the need for a dental procedure without "hard facts" up front. The ability to perform a detailed conscious oral exam will help you discuss potential concerns with owners up front and facilitate conversation during or after a dental procedure when treatment has been performed.

Questions to ask the owner include those about feeding, appetite, chewing habits, toys and play, self-grooming, and treats in addition to inquiring about home care and previous dental procedures.

First, I like to look at the pet's face for any indication of subtle facial swelling, asymmetry in muscles of mastication, skeletal asymmetry, malocclusion, epiphora, mucocutaneous junction, and lip folds [Figures 1, 2 on page 2]. Getting the pet used to my touch and handling around the face, I will then feel over the muscles of mastication. As I am "petting," I gently retropulse the eyes and palpate the ventral aspect of the mandibles and the mandibular lymph nodes. Any abnormalities are noted, and the next step is moving on to an examination of the oral cavity and teeth.

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CARDIOLOGY

Torsemide: An Alternative Diuretic

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Loop diuretics have been a mainstay of treatment for congestive heart failure (CHF) for decades, with furosemide the most commonly used drug for veterinary patients. Dogs and cats receiving treatment for CHF often require progressively increasing doses of diuretics to manage their disease, both because of progression of their underlying disease and due to the development of diuretic resistance. Well-described in human patients, diuretic resistance occurs due to numerous factors, including nephron hypertrophy, poor oral bioavailability, poor renal perfusion, and activation of the renin-angiotensin-aldosterone system.

Torsemide is a loop diuretic and a chloride-channel blocker, shown to have a greater bioavailability, longer half-life, and longer duration of action than furosemide in human patients. In addition, torsemide has aldosterone antagonist properties, which may lead to blunting of diuretic resistance and has antifibrotic effects on the myocardium. The TORIC study (Torasemide in Congestive Heart Failure)[1] demonstrated superior performance of torsemide in human patients, when compared to furosemide and other diuretics, in lowering total mortality and cardiac mortality as well as in reducing hospital readmission rate. In fact, a 2009 review of loop diuretics recommended that torsemide be considered a first-line therapy in humans with heart failure, based on the more favorable pharmacokinetics, efficacy, and safety compared to furosemide.[2]

Torsemide has been increasingly studied and used in our veterinary patients as well. The basic

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DENTISTRY

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FIGURE 1

↘ Subtle right-sided facial swelling

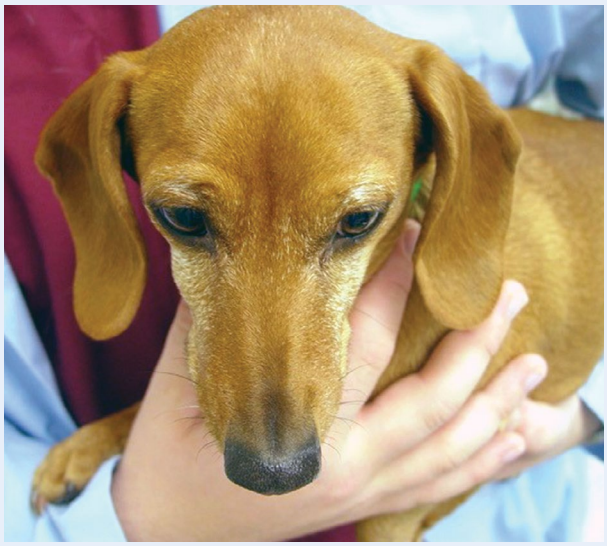

FIGURE 2

↘ Examination of the right sided premolars/molars in a cat. This view also includes ability to assess the canine teeth.

The patience and tolerance of each individual pet can vary significantly, so a quick but thorough examination routine will be of great benefit. The best system is *to perform your oral exam the same way each time* and be familiar with typical, normal findings, so that any abnormalities will be readily apparent.

I like to start by examining one complete side of the mouth and then the other, typically looking at buccal surface of the canine teeth and premolars/molars before examining the incisor region [Figures 3, 4A–4C). I keep the mouth closed during this phase of the exam but may open it slightly to get a good view of the buccal aspect of the mandibular molar(s). Oftentimes, looking at the incisors will cause dogs to sneeze. Brachycephalic breeds can be challenging because as the upper lip is lifted, it causes slight occlusion to the nares. If this is irritating to them, I try to leave this for after I have examined the rest of the teeth.

Abnormalities of the dental hard tissues to look for include: missing teeth, tooth fractures, pulp exposure, any change in opacity or discoloration, rotation, crowding, root exposure, and furcation exposure. Soft tissue changes include gingivitis, gingival recession, ulceration, or surface changes (masses, changes in color).

It is helpful to keep a generalized calculus and gingivitis index in the record on which you can look back to get an idea of the progression of dental disease. This can also be helpful when creating a treatment plan. Calculus index is graded 0-3/3 with the following guidelines: calculus index 0/3 indicates no appreciable calculus visible; calculus index 1 means less than one-third of the buccal surface of the tooth is covered by calculus; calculus index 2 indicates one-third to two-thirds of the buccal surface is covered by calculus, including subgingival deposition; and calculus index 3 means more than two-thirds of the surface is covered by calculus and extending subgingivally. Gingival indices, similarly, are graded on a 0-3/3 scale. A gingival index of 0/3 would denote no gingivitis; a gingival index of 1 denotes mild edema and redness; a gingival index of 2 includes increased edema, redness, and (on anesthetized exam) bleeding following probing; and a gingival index of 3 includes edema, redness, swelling, and spontaneous bleeding or bleeding with mild touch.

FIGURE 3

↘ Examination of the canine teeth and incisor region in a cat.

It is possible that calculus accumulation may vary in different areas of the mouth, and while I give a generalized calculus index, I may also describe a focal area that is different from the remainder of the mouth. A very important clue can be present with asymmetric calculus accumulation. The area in which calculus is heavier will indicate the side of the pet's mouth that they are avoiding. If they are chewing less on this side, more plaque and calculus will accumulate there. If during an examination there is such heavy calculus that I cannot view the teeth, but I can see visible asymmetric

DENTISTRY

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FIGURE 4A

↘ Asymmetric calculus in same patient as Figure 1. Left maxillary arcade.

FIGURE 4B

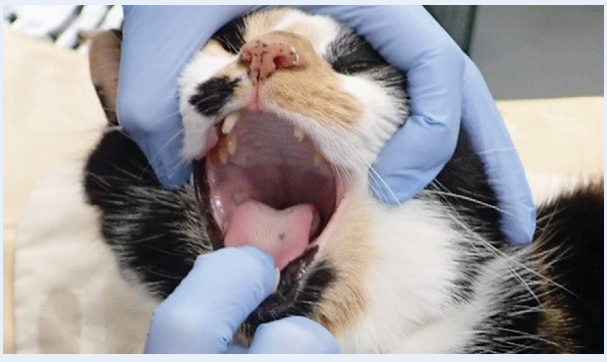
↘ Right maxillary arcade with much heavier calculus accumulation.

FIGURE 4C

↘ Complicated crown fracture of tooth 108, same side as facial swelling and increased calculus.

FIGURE 5

↘ Positioning for caudal oral exam. The thumb of the lower hand can be used to press under the chin between the mandibles to "elevate" the tongue and visualize sublingual tissues.



calculus, I will alert the owners to the possibility of a tooth fracture or abscessed tooth [Figures 4A–4C].

Next I examine the mouth while open, evaluating the molars, hard and soft palate, tongue, and sublingual area [Figure 5]. The last aspect of the oral exam is to look at the mucosa lining the cheeks to evaluate for buccal granulomas, masses, changes in pigmentation, or ulcerations.

The normal bite should be a scissor bite with interdigitation of the premolars, and maxillary incisors should sit just slightly rostral to mandibular incisors. Other occlusal relationships (malocclusions) include mandibular mesioclusion (maxillary brachygnathism, or underbite) or mandibular distoclusion (mandibular brachygnathism, or overbite), rostral or caudal crossbite, level bite, and individual tooth malocclusion.

When the oral exam of the conscious patient is complete my aim is to classify and summarize the issues I have identified. I tell the owners about "red flags" found during the conscious examination and teeth that likely need to be addressed, and I make them aware that additional issues may be found upon probing and viewing below the gum line with dental radiographs. Having a prepared and well-educated owner will lead to the best success in treatment for each individual pet.

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pharmacokinetic and pharmacodynamic properties have been determined. It has been shown that torsemide at 1/10th the dose of furosemide produces equivalent diuresis in dogs, and that torsemide's duration of action is approximately twice that of furosemide (12 h vs. 5-6 h).[3] A case series of three dogs with advanced heart failure described successful use of torsemide to achieve apparent long-term resolution of CHF in patients previously suffering frequent relapses (suspected due to diuretic resistance) on furosemide.[4] A 2012 study demonstrated that torsemide was well tolerated and is equivalent to furosemide at controlling clinical signs of CHF in dogs in the short term (double-blinded, randomized, crossover design with total of 14 days in the study period).[5] Torsemide use in cats is under investigation as well, and two studies (presented at recent veterinary forums)[6,7] retrospectively evaluated cats receiving torsemide yielding similar results. Torsemide was generally well tolerated in these cats with heart failure and a high diuretic requirement, although increased azotemia and decreased potassium were noted in both groups of cats at the first recheck, with a proportion of cats in both series requiring reduced torsemide dosing during chronic use due to azotemia. Increased risk of azotemia may be a concern in our canine patients as well.

Thus far, most use of torsemide in U.S. veterinary patients has been to replace furosemide for patients on moderate to high furosemide doses (roughly 4-8 mg/kg/day). The pharmaceutical company Vetoquinol announced the European release of UpCard® (torasemide) in 2015. The company markets this as a once-daily medication (licensed for dogs), and the 2017 TEST study (Short-Term Efficacy and Safety of Torasemide and Furosemide in 366 Dogs with Degenerative Mitral Valve Disease) results demonstrated that torsemide (once daily) was non-inferior to furosemide (twice daily) as part of standard CHF therapy over three months.[8] It seems likely, therefore, that our European colleagues may be among the first to try torsemide as a first-line diuretic in their veterinary CHF patients rather than as a replacement for furosemide.

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↘ Angell at Nashoba

Angell Animal Medical Center and Nashoba Valley Technical High School operate Angell at Nashoba, a veterinary clinic that provides quality care to the general public and offers deeply discounted services for qualified low income families.

Services provided include:

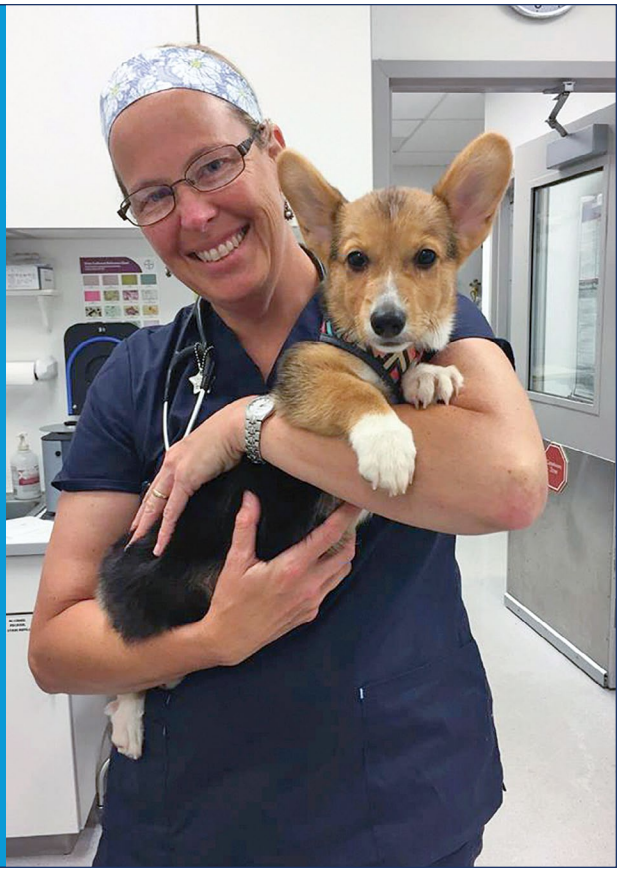
- Primary veterinary care
- Surgery and Dental services

The clinic also serves as a rigorous academic and experiential training program for students enrolled at Nashoba Valley Technical High School.

Open weekdays from 7:45am – 4:00pm, Angell at Nashoba does not provide overnight care, specialty service care, or 24/7 emergency service as Angell's Boston and Waltham facilities do, but will refer cases as appropriate to surrounding specialty veterinary referral hospitals.

For more information, please visit **angell.org/nashoba**

Angell at Nashoba | 100 Littleton Road, Westford, MA | 978 577-5992



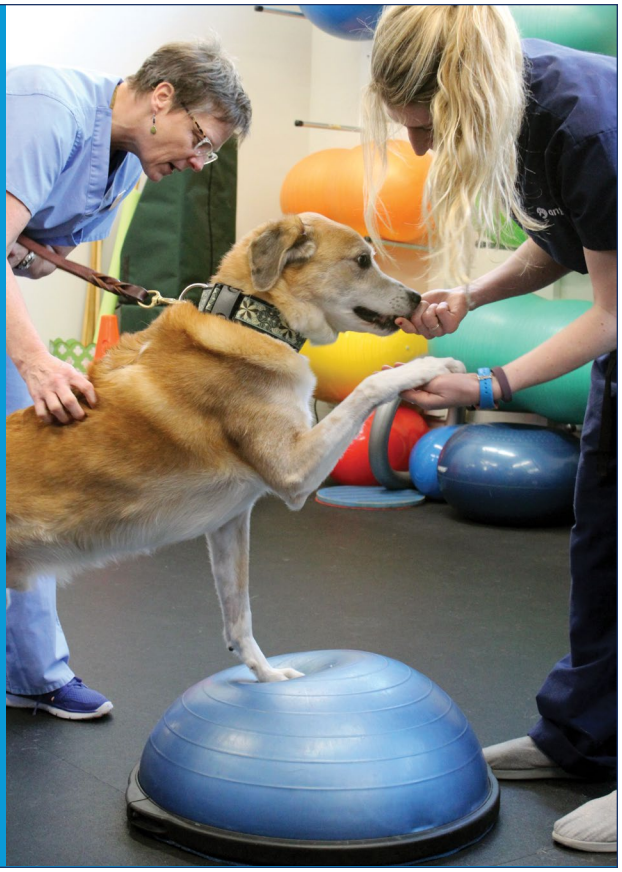
↘ Physical Rehabilitation at MSPCA-Angell West

Canine physical rehabilitation is used to treat a wide variety of orthopedic and neurological conditions. Whether recovering from an injury, or cross training, or facing mobility issues, dogs can substantially benefit from physical rehabilitation.

MSPCA-Angell West Physical Rehabilitation offers services seven days per week. Jennifer Palmer, DVM, Certified Canine Rehabilitation Therapist (CCRT), and Amy Straut, DVM, CCRT, lead our Physical Rehabilitation team. Visit **angell.org/rehab** for details and video footage of the impact of their work on our canine patients.

Current physical rehabilitation services include:

- Hydrotherapy
- Manual therapy
- Massage
- Chiropractic
- Land-based exercise
- Therapeutic laser treatment
- Consultation and fitting of assistive devices



A Rational Approach to Acute Vomiting in Dogs

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Acute vomiting is one of the most common presenting complaints recorded for urgent appointments in veterinary medicine. The workup and treatment for vomiting can be very simple or may require extensive diagnostics and supportive care. As our profession has grown, veterinarians have become more dependent on more advanced diagnostics. In-house laboratories, remote radiologists, and abdominal ultrasounds are now readily available in many practices, but as an example, just because we can do an abdominal ultrasound does not mean that all vomiting dogs need one. Diagnostic approaches should vary based on the signalment, history, and clinical condition of the patient.

The first thing to consider in the acute vomiting pet is the signalment. Is the dog young or older? Young dogs are more likely to have gastrointestinal (GI) parasites, dietary indiscretion, GI foreign bodies, or intussusceptions. Vomiting is usually not related to metabolic problems (with the exception of Addison's disease) in younger animals. In older dogs, systemic illness is generally more of a concern.

The history is vital in determining your workup. How much vomiting, what the dog has been eating that may be unusual, potential toxins, or drug exposure should all be considered. Sometimes an acutely vomiting dog has a history of chronic vomiting. It is critical to ask the questions and not just rely on what the client is telling you. As veterinarians, we can judge what in the history is significant. Clients may not know that what they have given their pet is toxic for dogs. Ask questions such as: have they given any new medications; has the dog eaten anything he usually does not get; and have they recently changed brands of food. These are critical things to know, and they may be the cause of the dog's clinical signs. A good example is the client who gave his dog ibuprofen for several days prior to the vomiting episode with the intent to help the dog with unrelated pain.. Knowing this prior to doing the workup can save the client hundreds of dollars and allow for more accurate treatment.

Additionally, in today's practice it is routine for a technician to get the history from a client before a veterinarian comes in for the exam portion. It is very reasonable for the veterinarian to again review the history with the client, as many times the owner will remember things the second time around after being prompted initially by the technician's questions. I am amazed at the number of times a client tells me something totally different from what they tell the technician, or they omit a critical part of the history. Other important questions include: how soon after eating does vomiting occur; is the vomitus foodlike, digested, or liquid; and is the patient actually vomiting or regurgitating (regurgitation being a more passive, less forceful movement of ingested material, usually before it even reaches the stomach). The diagnostic workup between vomiting and regurgitation may be much different.

As our profession has advanced, there is less emphasis on the physical exam because of the quick access to more advanced diagnostics (for example, STAT blood work, AFAST, and full abdominal ultrasounds). A complete physical exam is critical in guiding how aggressive one should be in designing the diagnostic and treatment plans. Hydration status and perfusion should be assessed. Skin turgor and mucus membrane moisture should be assessed together. Tacky mucous membranes generally correlate to 5% dehydration, decreased skin turgor generally 7%, and dry mucus membranes with tented skin correlate to about 10%. Take into account the age of the animal when assessing hydration, as geriatric animals often (normally) have decreased skin turgor. Cardiovascular status can also help guide your decisions. Animals that are tachycardic with poor pulses are treated very differently from those with normal cardiovascular parameters. If the vomiting is severe, serious consequences may result, including dehydration, acid-base and electrolyte disturbance, esophagitis, or aspiration pneumonia.

Abdominal palpation is also very important in your assessment. Is there a palpable mass? Is there significant abdominal discomfort? The finding of abdominal pain and/or dehydration almost always requires more aggressive treatments; however, it is reasonable to take a more conservative approach in more stable patients. Most vomiting animals will not need an abdominal ultrasound, but all should have a good physical exam. An abdominal ultrasound is not a replacement for a thorough abdominal palpation.

The diagnostic workup for a dog presenting with acute vomiting should correlate with the signalment, history, and physical exam findings. If an animal is well hydrated and has no abdominal discomfort, then conservative management may be fine. A diagnosis does not have to be made each time, as the exact cause of acute vomiting is often never discovered. Many times conservative management (withholding food and water, prescribing a bland diet, possibly administering anti-emetics and/or SQ fluids) on an outpatient basis is all that is needed. It is reasonable to order basic blood work to rule out potential toxic insults if the historical cause of the vomiting is not known. In a young dog with a history of eating inappropriate items, performing radiographs to rule out a potential foreign body is always a prudent diagnostic step.

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As long as the patient is well hydrated and clinically stable, taking a stepwise approach is reasonable. If the dog is improving, it is not necessary to continue the diagnostics. But if the dog is not getting better, further diagnostics (radiographs, abdominal ultrasound, and basic blood work) will be needed. The decision to hospitalize a dog should be based on the history, clinical assessment, and the client's financial abilities. As always, thorough and frequent client communication can help facilitate this stepwise plan.

One of the areas up for debate in our hospital is the use of anti-emetics—more specifically, maropitant—in the animal who is acutely vomiting. Maropitant is a neurokinin-1 receptor antagonist that inhibits substance P binding to NK-1 receptors in the emetic center, chemoreceptor trigger zone, and the enteric plexus of the gut. It is an excellent anti-emetic and is commonly used in the acute vomiting patient; however, it should be used cautiously in animals suspected of having a GI obstruction. When given to an animal with a GI obstruction it may cause the vomiting to stop (at least for a while) and may make it seem as if the animal is improving. It could delay the decision to pursue more advanced diagnostics and thus delay surgical intervention. Dogs with GI obstructions not given maropitant will continue to vomit, pushing the clinician to find a cause. Even a 6-hour surgical intervention delay in a dog with a GI obstruction could lead to an intestinal perforation. The use of anti-emetics in dogs suspected of having a GI obstruction should be considered carefully if advanced imaging is not planned. On the other hand, if the cause of the vomiting is known or advanced imaging is pending, there is no reason not to give it if indicated.

Steps to address acute vomiting in dogs can vary from a quick outpatient visit (or even a phone call) to hospitalization with aggressive supportive care and emergency surgery. Not every animal needs a full workup to determine the cause of vomiting. Diagnostic workups and treatments depend on the signalment, getting a good history, performing a thorough physical exam, and the clinical condition of the patient. Taking the time to accurately assess each animal is vital to providing appropriate care, preventing the accrual of inappropriate costs, and achieving improved client satisfaction.

↘ Angell's Comfort Care Program Provides Extra TLC to Patients

The Angell Comfort Care Program provides extra comfort and reassurance for hospitalized patients in our Critical Care Unit (CCU). Trained MSPCA-Angell staff volunteers provide extra cage-side affection to patients identified by veterinarians and technicians as animals that would benefit from additional TLC due to their particular circumstance (prolonged hospital stay, their level of anxiety, etc.).

Research indicates that comfort care makes a big difference for human babies—with faster weight gain, shorter hospital stays and improved social, emotional, and physical development resulting from a well-executed program. We anticipate that the Comfort Care program will result in similar benefits for animals, including the reduction of patient anxiety and pain sensation.

Volunteering for the Comfort Care program is limited to MSPCA-Angell employees, who undergo training in animal behavior before starting. Volunteers spend anywhere from 10 to 15 minutes with each animal before moving on to other patients.

Visit us on the web at: **angell.org/comfortcare**.

A Clinical Approach to Canine Neck Pain

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Neck pain is a common reason for seeing a veterinarian, whether as a routine appointment, on an emergency basis, or as an appointment to see a specialist. Cervical hyperesthesia, regardless of cause, can be subtle or debilitating, with varying degrees of severity between these two extremes. Such a clinical sign can be peracute, acute, or chronic, with each of these historical aspects just as clinically relevant as another.

Neck pain can substantially affect overall quality of life. When compared to hyperesthesia originating from, for example, the back, cervical hyperesthesia may seem more emergent to owners, due to the accompanying clinical signs. Hunched posture, low head carriage, reluctance to walk or take stairs (notably, descending generally more problematic than ascending), inappetance, vocalizing, limping and/or holding a thoracic limb off the ground, gastrointestinal signs (likely due to the accompanying distress/anxiety, occasionally from an offending pharmaceutical within a medical regimen), and lethargy are common presenting complaints in dogs with neck pain and can be quite difficult to watch at home.

A general physical examination is invaluable in determining the presence of neck pain. Vital parameters may demonstrate an elevated body temperature, whether hyperthermia or pyrexia, tachycardia and/or tachypnea. Often it does not take much to elicit neck pain upon cervical palpation. One can generally start applying gentle, bilateral, medially directed pressure on each pair of transverse processes within the cervical spine. Starting with a minimal amount of force often helps to establish a comfort zone with the patient. The most common behaviors shown by dogs with neck pain are vocalization, muscle spasms (often palpated and not directly seen), lower head carriage during and/or immediately after palpation, and ear pinnae shifting caudally. Once discomfort is recognized, further examination may only disrupt the positive relationship between the veterinarian and patient, although additional head and neck movements in a vertical/horizontal direction may enable a more specific finding than generalized neck pain.

Neck pain can occasionally be misinterpreted as back pain, possibly due to the head and neck movements during thoracolumbar palpation. Making the clinical diagnosis of neck pain can often be the greatest hurdle to jump over, especially in situations where the clinical signs are vague and/or the pain is difficult to elicit on examination, whether due to level of severity or variability in stoicism among breeds.

Neck pain can originate from either one or multiple anatomic locations. Skin, subcutaneous tissues, vertebrae, articular facets, intervertebral discs, meninges, and spinal cord are considered the most common potential primary sources for neck pain. Thinking of these anatomic structures during examination can help the clinician formulate a list of differential diagnoses incorporating a comprehensive range of disease categories.

Patient signalment is critical in helping to formulate a list of differential diagnoses. Although differential diagnoses are typically ordered from most common to least, it remains beneficial to have a comprehensive list of differential diagnoses to keep all possibilities open, as those less common diseases will appear every now and then, depending on how many cases of neck pain are seen in any given veterinary clinic or hospital.

Once neck pain is established with an ordered list of differential diagnoses, a minimum database is often an excellent set of tests to start with. A CBC, chemistry, urinalysis, and 4Dx might suggest systemic inflammation and/or systemic abnormalities, which, in keeping with clinical abnormalities found in addition to neck pain, such as pyrexia, joint pain, and multifocal paraspinal hyperesthesia, will help order the differential diagnoses further.

Cervical orthogonal radiographs taken with the patient under sedation are not only important for establishing presence of lytic bone and/or endplate disease, intervertebral disc disease (mineralized intervertebral discs, narrowed intervertebral disc spaces, sclerotic end plates, or opacification of intervertebral foramina), degenerative joint disease, and spondylosis deformans, but they

COMMON CAUSES OF NECK PAIN	
Vascular	Fibrocartilaginous embolic myelopathy; acute, high-velocity non-compressive intervertebral disc extrusion
Inflammatory	Steroid-responsive meningitis and arteritis; meningoencephalomyelitis of unknown etiology/origin; meningomyelitis; discospondylitis; polyarthritis
Traumatic	Luxation/subluxation; fracture; intervertebral disc-related injury; concussive/contusive event
Anomalous	Syringohydromyelia; spinal arachnoid diverticula; arteriovenous malformation; cranial cervical junction anomaly; cyst
Neoplasia	Primary; secondary
Degenerative	Intervertebral disc-related spinal cord +/- meningeal compression; osteoarthritis; degenerative joint disease

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FIGURE 1

↘ A radiograph showing a lateral view of a canine cervical spine, depicting C7-T1 narrowed intervertebral disc space, sclerotic end plates, and regional spondylosis deformans.

importantly serve as the only imaging modality taken in situations where the clinician feels conservative management is needed prior to considering further advanced testing modalities, most of which require general anesthesia.

Third-tier testing, including MRI, CT, cerebrospinal fluid analysis, pathology review, joint aspirate and cytology, infectious disease titers, and cerebrospinal fluid culture and sensitivity should be considered from the outset of initiating care, with clinical judgment and informed consent guiding the decision to start conservative management or pursue timely testing toward a definitive diagnosis. If conservative management is elected prior to considering further testing, the importance of a means for follow-up within a week, either by email or phone, on behalf of the client to the veterinarian, cannot be overstated.

When considering conservative management in a dog with neck pain (likely because the clinician feels with an otherwise normal general physical examination and given signalment there is a higher likelihood for intervertebral disc-related injury), rest and physical activity restrictions are advised in order to reduce the risks of exacerbation and making the clinical situation worse. Minimizing free access to stairs, avoiding neck collars, and preventing rough play are typically recommended for a given period of time, usually on the order of weeks.

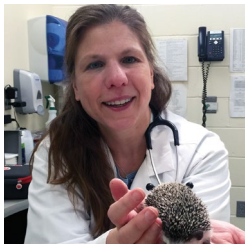
Conservative management involves some type of drug regimen in most cases. The benefits of a medical regimen, such as improved comfort, mobility, and appetite, should be weighed against the potential risks, such as artificially causing a situation in which a dog may feel better than it should and inadvertently setting the stage to make a bad situation worse, directly contributing to gastrointestinal upset, and/or delaying potential further tier testing in a situation where such testing is indicated.

Pharmaceuticals often employed in medical regimens for a conservative approach to neck pain include NSAIDs, gabapentin, tramadol, amantadine, opioid patch, methocarbamol, and corticosteroids. An NSAID +/- amantadine is usually effective in situations of neck pain that are going to respond to time, rest, and medical management (e.g., soft-tissue injury or intervertebral disc-related injury), although gabapentin and tramadol are additional considerations. A proposed timeframe for such a medical regimen is ~10-21 days, tapering the medication during this time. If the neck pain persists during or after this time period and/or further clinical signs become evident (additional body system involvement, lethargy, inappetance, progression of neck pain to include signs of myelopathy), prompt referral to a specialty hospital is recommended.

It is advisable to hold on recommending corticosteroids in this time of conservative management, as such therapy may falsely give the client and/or clinician the impression that the pet is improving and may make further diagnostic test results more challenging to interpret toward making a definitive diagnosis.

Adjunctive therapy, such as massage, acupuncture, and physical rehabilitation, are excellent modalities to consider, but they might be better considered once the cause of neck pain has been established and/or a degree of chronicity has been established for which a conservative regimen has been effective.

AVIAN AND EXOTIC



The Pet Bird Emergency—Triage and Initial Support

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Ideally, any and all triage staff (technicians, front desk) should be able to recognize a bird that is too debilitated to wait in the lobby. Generally this bird is lying on his ventrum in the bottom of the transport carrier, possibly fluffed, with wings drooping or eyes closed, poorly responsive to his surroundings, or with difficulty breathing. If any of these are present, the bird should be brought to be placed on heat and oxygen right away, and the appropriate doctor alerted.

A bird in this condition is likely too debilitated to tolerate much handling. In that situation, it is useful to be able to estimate weight, just as one may do for a dog or cat in crisis (Table 1).

TABLE 1

Average Weights of Common Birds	
Finch	10-15 gm
Canary	15-20 gm
Budgie	30 gm
Cockatiel	80-120 gm
Small Conure	60-80 gm
Large Conure	100-120 gm
Quaker	90-120 gm
Amazon	350-500 gm
Eclectus	375-450 gm
Small Cockatoo	250-400 gm
Large Cockatoo	700-1000 gm
Macaw	900-1500 gm

In general, these birds are usually some combination of: hypothermic; hypoxic (anemia, respiratory or cardiac disease, increased metabolic demands); dehydrated/hypovolemic; hypoglycemic (anorexia, sepsis, increased demand, maldigestion); and/or septic, toxic, or traumatized. Emergency support can be initiated on the basis of these suspicions and estimated weight. Treatment and a limited examination will often need to be performed in incremental steps, with breaks in between to allow the bird to rest and recover, usually in heat and oxygen. It is not unusual for examination and initial treatment of a very debilitated bird to take close to an hour in this fashion, and clients are usually accepting of this once their expectations are set accordingly.

In addition to heat and oxygen support, a very debilitated bird may be profoundly hypoglycemic and can respond well to 50% dextrose applied to mucous membranes. (Intravenous or intraosseous is more efficient but can be overly stressful for a very compromised bird.) Subcutaneous warmed fluids (LRS at 25 mL/kg) can be given—the interscapular site is acceptable if the pet is too weak to be held for long. Empirical antibiotics are often given at this stage, with the reasoning being that if the bird is this weak due to sepsis, it will likely die before the need for antibiotics can be proven. Since pet birds are often very susceptible to gram-negative infections, a high dose (30 mg/kg) of enrofloxacin can be given. Although the acidic pH of this drug can make it somewhat caustic to administer intramuscularly, this route can usually be tolerated for a single injection and will have faster absorption than oral or subcutaneous administration. Dyspneic birds can benefit from an intramuscular injection of the bronchodilator terbutaline (0.01-0.1 mg/kg).

While the bird is recovering and absorbing the first round of treatments, a thorough history should be elicited. Most sick birds (like sick cats) look similar, and history details may be the only distinguishing feature to guide support and treatment, particularly history of exposure to other birds, or toxins such as lead, zinc, Teflon, avocado, salt, or garlic/onions. Diet should be discussed, including pellets, seed, table food, treats, and any supplements, as well as any systemic signs the owner may have noticed at home. Duration of inappetance or anorexia should be noted, as even 24 hours is enough to weaken most birds, particularly smaller species such as budgies, lovebirds, and cockatiels. Be alert for false histories, as birds will frequently attempt to hide illness until too sick to hide it any longer. This may result in "false polyphagia," in which a bird may seem voracious but will present with an empty crop and scant droppings, bile-stained feces, or decreased fecal output.

Birds that are standing and alert may be able to tolerate handling for slightly longer periods, although they should still be monitored closely while handling, and the examination or treatment aborted if dyspnea or weakness occurs. These birds may still benefit from oxygen and heat support for 15-20 minutes prior to handling, and owners are usually appreciative of this extra precaution when it is communicated to them. Respiratory rate, effort, and character can be assessed with little to no handling. If the bird requires frequent breaks, 50% dextrose may be applied to the mucous membranes at each stage of handling. Eyelid turgor can be quickly assessed to estimate hydration (a lifted eyelid should drop back in place quickly; a sluggish return indicates dehydration. See Figure 1, on page 10) and the amount of pectoral musculature on either side of the keel can be quickly palpated to assess body condition.

If the handling must be done in stages, warmed LRS SQ may be given at the next handling. The next PE priority is auscultation and assessing the caudal coelom for distention. If distention is present, the caudal coelom can be transilluminated with an ophthalmoscope to assess whether the distention is due to ascites or solid, such as a mass or organomegaly. Fluid compressing abdominal air sacs can lead to labored breathing. Fluid can be percutaneously aspirated if present, which can provide rapid relief of dyspnea. The fluid may be submitted for culture, cytology, and fluid analysis to help identify the cause (usually coelomitis, ovarian cyst, neoplasia, liver disease, or cardiac disease).

Birds that are more stable (stronger, standing, eupneic, reasonably hydrated, pink) can

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FIGURE 1

↘ Assessing hydration by eyelid turgor. In a hydrated patient, the upper lid returns quickly to its normal position. In a dehydrated patient, the lid returns only slowly to position, if at all.

sometimes have a small amount of blood (0.02-0.05cc) drawn either from the right jugular or tarsometatarsal vein, e specially following 15-20 minutes on heat and pre-oxygenation. For these mini blood draws, I prefer a U-100 insulin syringe, which wastes less blood in the hub of the needle. After the blood is drawn, I usually will cut off the needle and hub using guillotine-style nail clippers, to prevent red blood cell lysis that may occur from forcing the blood back through the small gauge needle. I will use one drop of blood for a point-of-care blood glucose via a handheld glucometer (normal is >280 mg/dL), a drop or two for a microhematocrit PCV and total solids, and a few drops for blood smears for a white blood cell count. In addition to the physical examination findings, this can help identify which birds are sick enough to be hospitalized and which birds may require an IO catheter for dextrose CRI. In most cases in which birds present as emergencies, further testing may be indicated, but it usually must be deferred until the bird is stronger, euglycemic, and better hydrated. Owners are usually accepting of this once we help them recognize that their pet is in crisis and explain the plan to attempt stabilization.

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TECH TIP

It's the Little Things That Count: A Spotlight on Patient Care

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Seventy years ago, James Harriot was using barbiturates for anesthesia and performing phlebotomies on horses standing in icy rivers to treat laminitis. Today, we can treat kidney failure with dialysis, pneumonia with mechanical ventilation, and cancer with chemotherapy. Through the experience of veterinarians before us, ongoing research, and studying advances made by our human physician counterparts, veterinary medicine has come a long way. With the growth of our profession, the building of cutting-edge hospitals, and ability to hospitalize all creatures great and small, we have been able to save the lives of animals in ways we never imagined. However, when it comes to patient care and comfort, practicing the highest level of medicine is only part of the equation. Of equal importance to the sophisticated surgeries, ability to deliver supplemental oxygen and nutrition, and variety of analgesics available are the nonmedical therapeutics we can use to improve our patients' comfort and quality of life. This piece will focus on the little things we as veterinarians and nurses can do to help enhance our patients' comfort and well-being and perhaps even accelerate healing.

There have been numerous studies in the field of human medicine that correlate patient mortality, readmission to the hospital, and overall feeling of health with satisfaction of patient care and symptom relief. A 2006 study revealed that when human patients in an ICU receiving ventilation were asked to evaluate their perception of nine symptoms (pain, dyspnea, thirst, nausea, hunger, tiredness, anxiety, generalized discomfort, and depressed feelings), 100 percent answered in the affirmative.[1] This same study found that there are significant correlations between all symptoms, particularly unpleasant physical sensations and the feeling of depression. A 2011 study showed that when there was an appropriate patient-to-nurse ratio and nurses were able to provide appropriate patient care, the mortality rate was lower than when the staffing level fell below a target level.[2] While we as veterinary professionals cannot ask our patients if they have a headache, dry mouth, or depression, we can extrapolate that they feel similar physical experiences and emotions. In many cases we can measure these subjectively. Hypersalivation is a signifier of nausea, cowering in the back of a cage is a demonstration of fear or anxiety, and limping indicates pain. Unfortunately, many of the clinical signs our patients exhibit are due in large part to their disease and the reason they are hospitalized to begin with. It can be easy, therefore, to overlook the impact that specific patient care techniques may have. While advances in information, technology, and medications have allowed us as caretakers to alleviate patient discomfort in ways previously not possible, pain is not the only unpleasant sensation our furry, feathered, and scaly friends experience. Below, developed from observation and experience, is a list of procedures and systems that, while not new to the practice of veterinary medicine, when made routine may improve our patients' comfort and quality of life when in the hospital.

Steps to Improve Patients' Comfort and Quality of Life While Hospitalized

- **Clustering treatments** to minimize handling and allow patients to rest uninterrupted for longer periods of time
- **Removing food from the cages of anorexic animals** after 20 minutes to help decrease the risk of developing food aversions
- Placing **booties** or a light vet wrap bandage on the feet of geriatric patients or those with mobility issues, thus allowing them to walk more easily on slick hospital floors and cage bottoms
- **Providing frequent walks to dog patients** that are on high rates of IV fluids, are polyuric, or are having frequent bowel movements
- **Housing cat patients in a separate area** of the hospital or ICU and not adjacent to or above vocal dog patients
- **Assessing thirst periodically** for patients that cannot move to their water bowl, by holding the bowl closer to them
- **Using safe sedatives and anti-anxiety medications** for extremely anxious or fearful patients. Useful for planned visits and during hospitalization
- **Providing cat patients with a place to hide** in their cage, such as a box or bed with tall sides (with the exception of those with respiratory disease or seizures)
- When appropriate, **using soft e-collars** on cat patients or other small animals
- **At night or when possible, turning down or dimming lights,** or placing a towel or blanket over part of the cage to create a dark environment, thus creating a more natural atmosphere for sleep
- **Implementing the use of pheromone diffusers or sprays**, particularly in areas where cat patients are hospitalized
- When appropriate, transitioning patients that have been hospitalized for long periods of time to **larger cages or runs** to allow for more freedom of movement and natural behaviors
- **Providing routine oral care** to dehydrated, sedated, or critically ill patients
- **In patients with intravenous catheters, frequently checking** paw size and comfort. Pain or swelling may indicate catheter tape that is secured too tightly or the development of phlebitis
- **Encouraging owner visits** and, when appropriate, allowing owners to take their pets to a designated quiet area or outside
- **Increasing the nurse-to-patient ratio**

While many of these practices are dependent on the health status of the patient, patient temperament, and hospital caseload and staffing, they all represent a common theme: that the end goal is to help fulfill our patients' needs. In 1934, Abraham Maslow created a model of needs that drive human behavior.[3] The base of the hierarchy bears the needs of highest priority: the obvious physiological

needs such as food, water, sleep, and shelter. At the top are the needs that fulfill self-actualization. These include morality, creativity, meaning, and purpose. While we imagine our animal patients do not require the same satisfaction of graduating from college or traveling to a foreign country, we know as fact that they require all of the same basic needs. We should, however, also assume they desire some of the needs in the middle, including safety, social interaction, and love. As veterinary professionals, we are driven by the power and capacity we have to heal. We are also frequently limited in our ability to do so, whether it be due to financial constraints or a poor prognosis. However, regardless of the tests, medications, and lifesaving treatments at our disposal, or the limitations set by a diagnosis or money, we all have the ability to prioritize patient care and maximize comfort. In the end, it is the quality, not quantity, of life that matters.

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