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your *favorite* client query:

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AFAST³ for you and me

Since ultrasonography is becoming more accessible to all veterinary practitioners, learn all about this ultrasonographic examination protocol for trauma and start saving lives. *By Garret Pachtinger, VMD, DACVECC*

Most veterinarians are schooled on ARDS, SIRS and other common medical acronyms. But are you ready for FAST³?

FAST, which stands for

focused assessment with sonography for trauma, is a rapid bedside ultrasonographic examination and screening test for blood—or other abnormalities—after trauma.

More specifically, there are the abdominal FAST (AFAST), thoracic FAST (TFAST) and Vet BLUE (bedside lung ultrasound exam) techniques that have evolved to the FAST³ techniques—*focused assessment with sonography in triage, tracking and trauma*.

Why is it important?

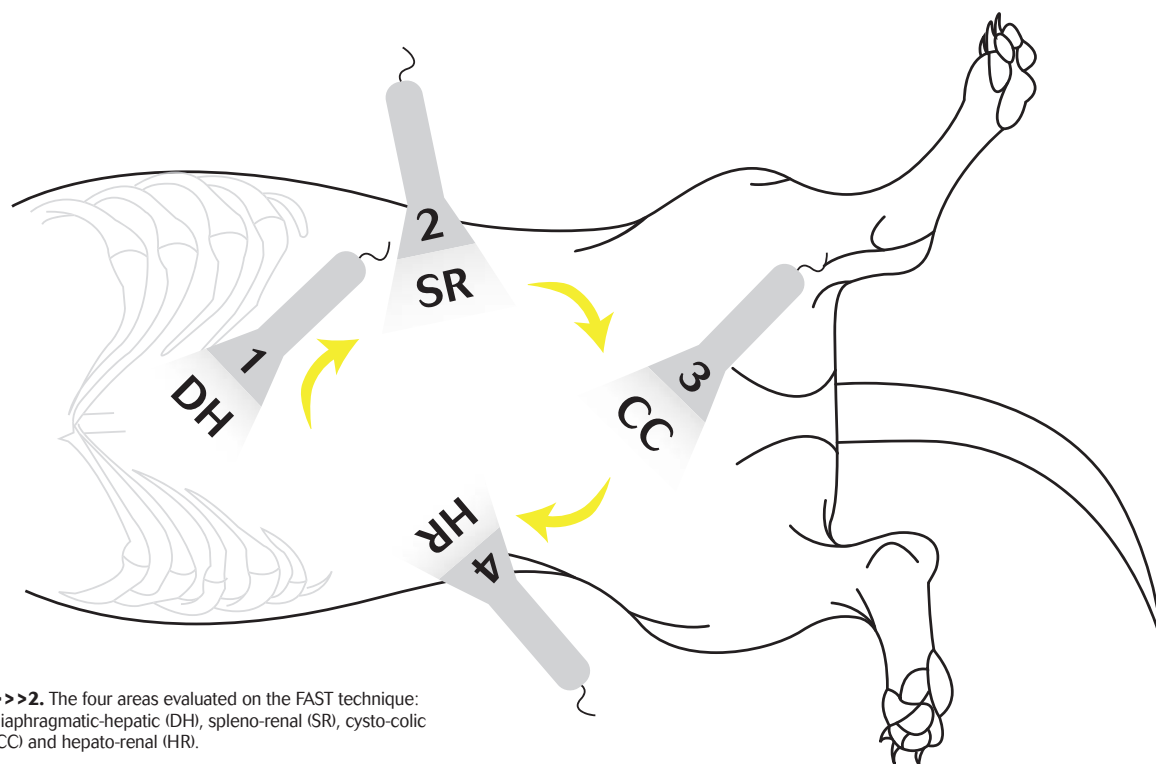
Why all the fuss with name changes and the fancy superscript 3? Although I often agree with infomercials, especially at 4 a.m. after a 16-hour shift, Ron Popeil was wrong. As clinicians, we can't just "set it and forget it" in medicine.

We need not only rapid initial triage and assessment, but also constant reassessment and tracking of our patients. We understand that the hypotensive, shocky patient may not have a definitive hemoabdomen on presentation. Rather it may take some time after fluid resuscitation for hemorrhage to present within a body cavity.

Focusing on the AFAST³ technique, why has this become so important in both human

>>>1. A radiograph from a 8.5-year-old spayed female English springer spaniel. Note the mild gas and fluid dilation of the stomach. The small bowel appears empty to mildly thickened or mildly fluid dilated. There is moderate remodeling of both hips with thickened femoral necks. Diagnostic impressions: Increased fluid in the stomach may be due to gastritis or pancreatitis. There is no evidence of foreign material or obstruction. Incidental moderate chronic hip arthritis is present.





>>>2. The four areas evaluated on the FAST technique: diaphragmatic-hepatic (DH), spleno-renal (SR), cysto-colic (CC) and hepato-renal (HR).

and veterinary medicine? There are clear limitations and concerns when moving a critically ill patient to radiology where it needs to be taped, sand-bagged or manually restrained to obtain diagnostic imaging results. Human and veterinary studies have demonstrated that radiographic serosal detail is not sensitive or specific at detecting abdominal fluid after blunt trauma (*Figure 1*).^{1,2}

Ultrasonography is thought to be a more ideal initial imaging modality as it can be performed simultaneously while other assessments are being performed and while resuscitative measures are provided. Importantly, there is no requirement to be a fancy board-certified radiologist to perform the ultrasound procedure. Non-radiologist veterinarians can be

quickly trained to perform the AFAST³ ultrasound to make life-saving clinical decisions.³

How does it work?

Now that I have your attention and before you head to eBay for an ultrasound machine, let's discuss how to perform the AFAST³. The patient is placed in right lateral recumbency to evaluate four specific sites within the abdomen (*Figure 2*):

- 1) Diaphragmatic-hepatic (DH)
- 2) Spleno-renal (SR)
- 3) Cysto-colic (CC)
- 4) Hepato-renal (HR)

The sites are evaluated in a clockwise motion as you look for evidence of effusion, which is typically identified as anechoic (black) areas around the identified organ structures (*Figure 3*). Remember, this is a quick and dirty evaluation. Shaving

the patient is not required. A little alcohol or ultrasound gel is sufficient, although it is important to remember to avoid using alcohol if the patient is critical

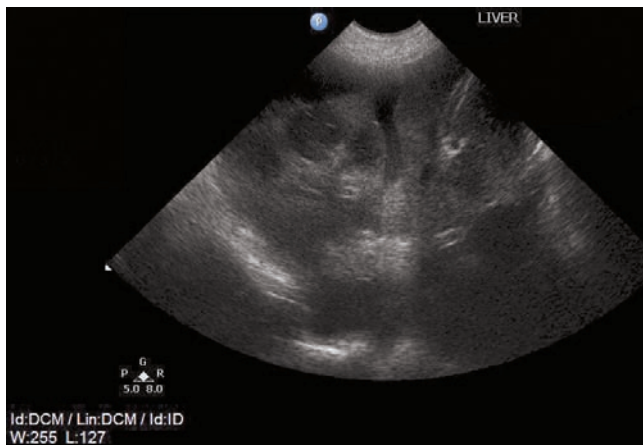
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>>>3. An ultrasonogram from a 10-year-old spayed female American bulldog. Multiple hypoechoic masses are seen throughout the liver measuring 1 to 4 cm. Mild effusion is present, seen here with an anechoic appearance.

and may require defibrillation (or has injuries including abrasions or lacerations).

Does it work?

I can see you are questioning these statements with the appropriate critical eye. Is this really better? Does this improve my patient evaluation? The answer—yes! In a prospective study of 100 dogs presenting for motor vehicle trauma, a FAST examination was found to have 96% sensitivity and 100% specificity for the detection of free abdominal fluid.⁴

Further studies were performed to determine the likelihood of the traumatic hemoperitoneum patient requiring a transfusion.¹ A fluid scoring system was described for the AFAST³ procedure, with one point given for hemorrhage at each of the four locations described above. An abdominal

fluid score (AFS) of 0 means there is no effusion at any site. An AFS of 4 means fluid was present at all four sites.

Dogs with traumatic hemoperitoneum with an AFS of 1 or 2 are considered major-injury, small-volume bleeders and rarely become anemic from the intra-abdominal hemorrhage. Alternatively, dogs that had an AFS of 3 or 4 are considered to

be major-injury, large-volume bleeders and are more likely to become anemic. In this study, about 25% of patients with an AFS of 3 or 4 developed anemia severe enough to require transfusion therapy.

Serial examinations (tracking) cannot be overemphasized. It's standard of care to repeat AFAST³ examinations four hours after admission in all stable cases to make certain an AFS of 1 or 2 is not developing into a 3 or 4. The take-home message: If a patient has an AFS of 3 or 4, be prepared with blood products, a blood donor or the possibility to transfer the patient to another hospital to provide transfusion therapy.

Are you ready for ultrasound?

Yes! If you are intimidated by technology and ultrasonography, there are numerous

courses available for practicing veterinarians, not only as wet and dry labs at conferences but as online courses such as fastvet.com and textbooks with images and protocols.⁵

Although ultrasonography is not 100% sensitive for intra-abdominal hemorrhage, it is practically perfect for recognizing intra-abdominal hemorrhage after trauma. An ultrasonographic examination provides a rapid assessment, which may not only improve patient care, but can be life-saving for your critical veterinary patients. **VM**

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SDMA pinpointed as biomarker for early diagnosis of feline renal disease

Why they did it

Chronic kidney disease in cats is often not recognized in the clinical setting until there is evidence of azotemia and loss of urine concentrating ability. Identification of sensitive serum biomarkers, which would allow early identification of cats with renal disease, would facilitate early intervention and improve patient care. Symmetric dimethylarginine (SDMA) has been found to be an accurate surrogate for estimated glomerular filtration rate (GFR) in people and a more sensitive biomarker of renal function. These studies sought to evaluate the utility of this biomarker in the setting of feline renal disease.

What they did

Three studies have evaluated the possible role of SDMA as a biomarker for feline renal disease.

In the first article ("Comparison of serum concentrations of symmetric dimethylarginine and creatinine as kidney function biomarkers in cats with chronic kidney disease"), the authors retrospectively reviewed SDMA and serum creatinine concentrations in 15 cats with azotemia for \geq three months, four nonazotemic cats with a greater than 30% decrease in GFR from normal, and two non-

azotemic cats with calcium oxalate kidney stones. Data from 21 healthy geriatric cats were also evaluated. Over a six-month period prior to enrollment, these cats had three normal GFR test results, three normal serum creatinine concentrations and three urine specific gravity assessments > 1.040 .

In the second article ("Comparison of serum concentrations of symmetric dimethylarginine and creatinine as kidney function biomarkers in healthy geriatric cats fed reduced protein foods enriched with fish oil, L-carnitine, and medium-chain triglycerides"), the authors fed control food or one of two experimental diets supplemented with fatty acids to 32 healthy cats. Cats were fed these diets for six months, and serum chemistry profiles, including SDMA and serum creatinine concentrations, GFR, and metabolic profiles, were performed at baseline and at 1.5, three and six months.

In the third article ("Relationship between serum symmetric dimethylarginine concentration and glomerular filtration rate in cats"), the authors sought to determine whether SDMA concentrations would rise as expected in cats with reduced GFR. GFR was measured by

using iohexal clearance in 10 client-owned cats. All cats were > 11 years of age, and both azotemic and nonazotemic cats were included.

What they found

In the first article, the authors found that both SDMA and serum creatinine concentrations correlated well to changes in GFR. However, SDMA was elevated before the serum creatinine concentration in 81% of cats (17 of the 21 subjects) by a mean of 17 months (range, 1.5 to 48 months). SDMA was elevated in all nonazotemic cats with a subnormal GFR. The SDMA and serum creatinine concentrations remained within the reference range for all the healthy geriatric cats.

In the second article, the authors found that diets supplemented with fatty acids did not result in any changes to renal biomarkers over the six-month period. However, they did find that SDMA appeared to be a more sensitive marker of renal dysfunction over that time frame, particularly



in older cats with decreased lean body mass. The authors noted that serum creatinine concentrations were positively correlated with total lean mass and that as total lean mass declined with age, serum creatinine concentrations declined as well. Conversely, SDMA concentrations did not correlate in the same manner with lean body mass; these concentrations increased in cats with declining GFR and body mass.

In the final article, the researchers found a reciprocal

linear relationship between the decline in GFR and elevations in SDMA concentration. And as expected, a direct linear relationship was also noted between SDMA and serum creatinine concentrations.

Take-home message

These results suggest that SDMA is a sensitive biomarker for early detection of feline kidney disease. Further studies will be needed to determine if early intervention in these cases will result in improved outcomes. **VM**

- > Hall JA, Yerramilli M, Obare E, et al. Comparison of serum concentrations of symmetric dimethylarginine and creatinine as kidney function biomarkers in cats with chronic kidney disease. *J Vet Intern Med* 2014;28(6):1676-1683.
- > Hall JA, Yerramilli M, Obare E, et al. Comparison of serum concentrations of symmetric dimethylarginine and creatinine as kidney function biomarkers in healthy geriatric cats fed reduced protein foods enriched with fish oil, L-carnitine, and medium-chain triglycerides. *Vet J* 2014;202(3):588-596.
- > Braff J, Obare E, Yerramilli M, et al. Relationship between serum symmetric dimethylarginine concentration and glomerular filtration rate in cats. *J Vet Intern Med* 2014;28(6):1699-1701.

Animal welfare: Reflections on why the veterinary profession should take a firm stance

In a commentary published in the *Journal of the American Veterinary Medical Association*, Barry Kipperman, DVM, DACVIM, discusses the unique role of veterinarians in influencing animal welfare standards. Evolution of these standards over the years has led to practices that not only encompass an animal's physical needs, but also consider the animal's mental health.

While Kipperman acknowledges that there has been some positive change the veterinary profession with respect to welfare standards, he notes that the welfare policies adopted by the American Veterinary Medical Association (AVMA) still tend to emphasize physical over emotional health, particularly in the food animal arena, and lag

behind society's views.

In his commentary, Kipperman provides two specific examples of animal welfare issues—battery cage confinement of laying hens and the use of gestation crates for breeding



sows—both of which restrict an animal's movements and do not allow for expression of natural behaviors such as nesting and rooting. Currently, AVMA policies take no position on either of these issues despite the fact that industry mandates and legislative initiatives have been enacted to phase out these sys-

tems because of their negative impact on animal welfare.

Given the AVMA's influence within the veterinary community as well as within the scope of public perception, Kipperman notes that the AVMA should do more to promote policies that favor mental health and natural behaviors in addition to physical well-being. "The public, animal advocacy groups, and veterinarians themselves expect the AVMA to not only mirror the changing roles of animals in society but also to act as a leader in guiding and improving our stewardship of all animals," concludes Kipperman. **VM**

Kipperman BS. The role of the veterinary profession in promoting animal welfare. *J Am Vet Med Assoc* 2015;246(5):502-504.



These "Journal Scan" summaries were contributed by Jennifer L. Garcia, DVM, DACVIM, a veterinary internal medicine specialist at Sugar Land Veterinary Specialists & Emergency Care in Houston, Texas.

What's *your* diagnosis?

Purulent upper respiratory discharge in a rabbit

After an enucleation, purulent material began coming from this rabbit's nose and filled the empty orbit.

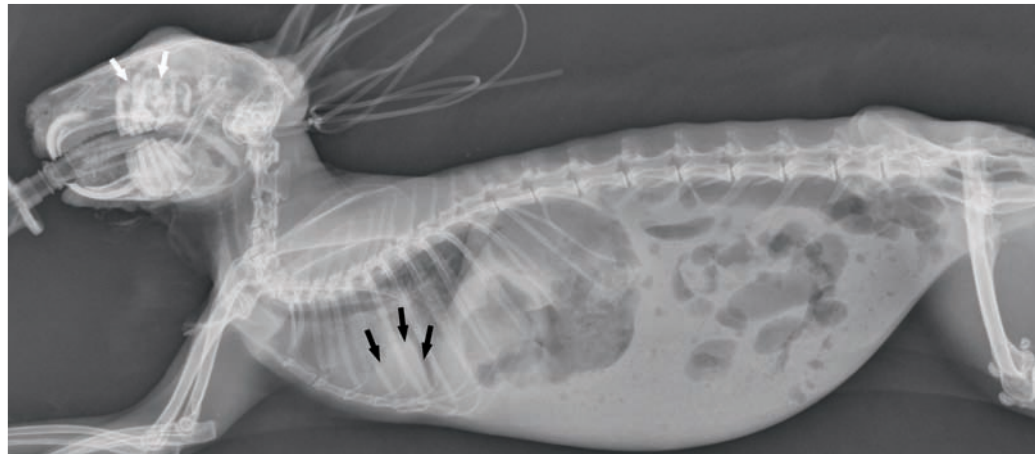
Find out why. *By Samantha D. Swisher, DVM; Vanessa L. Grunkemeyer, DVM, DABVP (avian); Mason Y. Savage, DVM; Jessica R. Durrant, MS, DVM; and Luke B. Borst, DVM, PhD, DACVP*

A 2.5-year-old castrated male mixed-breed rabbit was referred to North Carolina State University's Veterinary Hospital for evaluation of purulent discharge from the nares and from the site of a recent enucleation.

HISTORY

Starting at 18 months of age, the rabbit had been treated by the referring veterinarians with ocular corticosteroids and antibiotics for left-sided ocular discharge, which progressed to include periocular swelling and corneal ulcers. The eye had been enucleated one month before presentation. Soon after surgery, the orbit filled with purulent material, and the rabbit developed purulent nasal discharge.

The rabbit's appetite was reportedly good until after the enucleation, when it began to gradually decline. The owners



>>>1. A whole body radiograph of the rabbit in this case. The roots of multiple maxillary cheek teeth were poorly defined, with expansile lesions consistent with abscessation (*white arrows*), and the occlusal surfaces of the cheek teeth were uneven. In the thorax, there was a diffuse interstitial pattern and a patchy, ventrally distributed alveolar pattern, consistent with aspiration pneumonia (*black arrows*).

had been attempting to syringe feed (Critical Care—Oxbow Animal Health) in the days preceding their appointment but had been having difficulty.

PHYSICAL EXAMINATION

At presentation, the rabbit was orthopedic and open-mouth

breathing; both nares were occluded with purulent discharge. There was significant periorbital swelling on the left side, and purulent material could be expressed from the incompletely healed enucleation site.

A brief oral examination performed with an otoscope revealed halitosis, a discolored

Quick tip

After a brief evaluation, consider lightly sedating dyspneic small mammals before performing a full examination. A wide variety of sedation protocols are reported in the literature,⁵ but we find that a combination of butorphanol (0.2 to 0.4 mg/kg) and midazolam (0.5 to 1 mg/kg) intramuscularly or subcutaneously often works well for these patients.

right maxillary incisor and mild elongation of the left mandibular molars with mild lingual points. The rabbit was in poor body condition, had decreased gastrointestinal sounds on auscultation and produced scant feces during hospitalization.

On physical examination, the rabbit had purulent rhinitis and dacryocystitis, disease processes that are commonly associated with underlying dental disease in rabbits.¹⁻⁴ Although only mild abnormalities were noted during this rabbit's oral examination, underlying dental disease was still a top differential diagnosis. This rabbit also had evidence of gastrointestinal stasis, presumably secondary to stress and decreased food intake.

DIAGNOSTIC TESTS

Preanesthetic blood work revealed anemia (23%; reference range = 30% to 50%) and a normal white blood cell count ($5 \times 10^3/\mu\text{l}$; reference range = 5 to $12 \times 10^3/\mu\text{l}$) with relative heterophilia (60%; reference range

= 35% to 55%) and lymphopenia (20%; reference range = 25% to 60%). All serum chemistry profile values were within published normal ranges.⁵

On whole body radiographs (Figure 1), the roots of multiple maxillary cheek teeth were poorly defined, with expansile lesions consistent with abscessation (*white arrows*). The occlusal surfaces of the cheek teeth were uneven (a finding that was not appreciated on the conscious oral examination). There was subtle increased opacity of the left tympanic cavity and thickening of the tympanic bulla suggestive of otitis media.

In the thorax, there was a diffuse interstitial pattern and a patchy, ventrally distributed alveolar pattern, consistent with aspiration pneumonia (*black arrows*). The stomach was gas-dilated, consistent with aerophagia secondary to dyspnea. Gastrointestinal fill was subjectively decreased, and large pockets of gas were present in the cecum and intestines, consistent with gastrointestinal stasis syndrome. Serosal detail was decreased, most likely because of decreased abdominal fat stores.

Computed tomography (CT) confirmed extensive destruction of the roots of all the maxillary cheek teeth with osteomyelitis of the surrounding bone (Figure 2). The maxillary



>>>2. Transverse CT image of the skull at the level of the eyes. There is a large, expansile lesion affecting the left maxillary molar and extending into the retrobulbar space (*thick white arrows*). The left eye is absent. Note that the right maxillary molar is also affected (*thin white arrow*) and the nasal cavity is partially occluded (*black arrow*).

bone had expanded into the pterygopalatine fossa on the left side, causing a retrobulbar mass effect (*thick white arrow*). This effect likely contributed to the ocular disease that prompted the referring veterinarian to perform the enucleation.

The CT also confirmed the clinical suspicion that the nasal passages were completely obstructed and the nasal turbinates had been destroyed by severe rhinitis. Fluid was noted in the left bulla, further supporting a diagnosis of left-sided otitis media.

OUTCOME

Because of the degree of dyspnea and the grave prognosis associated with such severe dental disease, the rabbit was humanely euthanized. Necropsy confirmed abscessation

of the roots of all the maxillary cheek teeth. The nasal passages were occluded with purulent material, and the architecture of the nasal turbinates was destroyed (*Figure 3*). Marked otitis media and interna were noted in the left ear. The rabbit also had severe aspiration pneumonia, with more than 50% of the lung volume affected.

Typically, a full anesthetized oral examination would have been performed using an oral speculum and cheek dilators to improve visualization of the cheek teeth. In this case, because the owners chose to euthanize, this examination was performed postmortem and revealed minor unevenness of the occlusal surfaces, but no other significant findings.

DISCUSSION

Dental disease is common in rabbits and can encompass many disease processes, including malocclusion, elongation and tooth root abscessation.^{1,3} Dental disease can be associated with a number of secondary problems, including dacryocystitis, exophthalmos, rhinitis and sinusitis.¹⁻⁴

Given the progression of clinical signs and resulting pathology in this case, it is suspected that the rabbit's primary disease process was tooth root abscessation, with ocular and respiratory signs developing secondarily. One of



the abscesses had created a left retrobulbar mass effect, which most likely caused exophthalmos and secondary corneal ulceration. The ocular discharge could have been secondary to impingement on the nasolacrimal duct by the abscess or an extension of the disease through the duct. As the severity of the dental disease progressed, purulent material likely extended dorsally into the nasal cavity and possibly through the auditory tube into the left tympanic bulla. Enucleation may have contributed to the upper respiratory obstruction because closing the orbit eliminated a route for drainage of purulent material through the nasolacrimal duct.

Because rabbits are obligate nasal breathers,⁶ rhinitis compromises a rabbit's respiratory status more than it compromises a dog's or a cat's. The pulmonary disease can be

attributed to inhalation of purulent material from the nasal passages or aspiration of food material from assisted feeding.

Despite severe abscessation of all maxillary cheek teeth, this rabbit had a relatively unremarkable oral examination (even on necropsy) and had not exhibited changes in appetite until late in the disease's progression. This case illustrates the importance of performing imaging in all rabbits with upper respiratory clinical signs and most rabbits with ocular clinical signs, even if more classic clinical signs of dental disease (anorexia, ptyalism) are not present. In this rabbit, whole body radiography was also recommended to assess the lungs and the gastrointestinal tract.

While dental abnormalities were apparent on radiographs, CT allowed for a much more detailed evaluation of the

>>>3. Photos of the skull taken at necropsy with the skull sectioned just caudal to the eyes. Multifocal abscessation of the maxillary cheek teeth is apparent (*white arrows*). The nasal passages are partially occluded with purulent material (*black arrows*).

Key points

1. Ocular and upper respiratory disease in rabbits is often associated with underlying dental disease.
2. A normal oral examination does not exclude dental disease as a possible cause of a patient's clinical signs.
3. Use of sedation is strongly recommended for the examination and imaging of small mammals that are in respiratory distress. If these patients are anesthetized, their airway should be protected.
4. While radiography allows for the preliminary assessment of dental health in rabbits, CT is strongly recommended for full evaluation of dental, upper respiratory and ocular disorders.
5. In severe cases of dental-associated respiratory, ocular or otic disease, medical treatment alone is rarely successful. Surgical intervention is almost always required to improve a patient's clinical status. Even with aggressive surgical treatment, the prognosis is fair to grave, depending on the severity of disease.
6. Any disease process that causes pain or stress in rabbits can be complicated by secondary gastrointestinal stasis. Providing nutritional support to a dyspneic rabbit can be challenging and carries a high risk of aspiration.



View the references for this article at dvm360.com/rabbitdental.

extent of disease.⁷ CT is the preferred imaging modality for full evaluation of dental and upper respiratory anatomy and should be considered for all rabbits with suspected tooth root disease.^{1,3,4}

For practitioners who do not have access to this technology or clients who are unable to afford it, a six-view skull radiograph series taken with mam-

mography or dental film can provide more detailed information than the two-view whole body radiographs shown here. However, these images can be challenging to acquire and interpret for practitioners who do not have extensive experience with them, and CT images are often more intuitive to interpret. Radiographs also provide much less detailed information about the upper airway and the retrobulbar space, which were important in this case.⁸

Treatment of odontogenic abscesses and their sequelae is different in each case, but these patients generally require surgical intervention, including abscess débridement, tooth extraction or rhinotomy.^{1,3,4} Because rabbit heterophils contain lower activities of myeloperoxidase than other mammals', their purulent exudate is thicker and more tenacious.⁹

Medical therapy alone is rarely successful, but antibiotic therapy may be helpful as an adjunct to surgery. It is recommended that antibiotics be selected based on culture and sensitivity performed on samples taken at the time of surgery. A recent study suggests that penicillin (given parenterally only, never orally) or chloramphenicol may be good empirical choices, pending culture results.¹⁰ Even with aggressive management, owners should be aware that

procedures are palliative and complete cure is rare.

Nutritional support is also critical for these patients to prevent secondary gastrointestinal stasis. Unfortunately, syringe feeding is often stressful for the dyspneic patient and carries a high risk of aspiration pneumonia. Placement of a nasogastric tube can be considered but may contribute to respiratory distress in a patient whose upper airway is already partially obstructed.¹¹ **VM**

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The ESSENTIALS

We're curating our own veterinary clinical content so you can find what you need now. By Mindy Valcarcel, Editor, Medicine Channel Director

Your patient in the next exam room has diabetes. Later today you'll see a patient with atopic dermatitis. Plus you know it's obese and serious problems are looming because this client balks on the topic of weight loss. And tomorrow's emergency visit may lead you to seek pointers on handling a patient you suspect has GDV. You've come to dvm360 to determine what the best next steps are.

You start by typing "diabetes" in the search, and, voila, almost 800 results. You don't have time to sort through all those results for what you need. So we've done it for you.

Meet *The Essentials* (find them online at dvm360.com/essentials). Each Essential

covers the elements of what you are looking for—diagnostic steps, treatment plan guidance and the latest updates, plus resources to share with your entire veterinary team and your clients. It's an essential package on a specific condition, curated by the *Veterinary Medicine* content team.

Although things have changed a bit since 1905—when *Veterinary Medicine* was first published—we've amassed an extensive depth and breadth of content. In these next pages you'll find the package highlights. And we'll continue to add more conditions so you'll be fully armed to help that patient waiting for you in the next room, no matter what the problem is. We have just what you are looking for, and we're helping you find it.

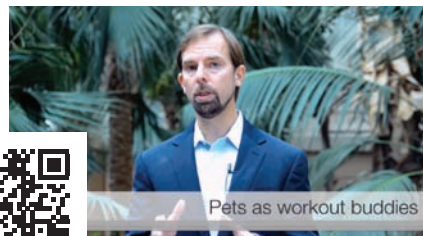
Obesity *in* pets:

An estimated **54%** of dogs and cats in the United States are overweight or obese, but clients don't always recognize that Parker has gone portly. We have curated our most informative articles to help you diagnose and treat it most efficiently and effectively. And we will keep you on top of new developments as they arise.

A veterinarian's view on exercising *with* pets



With the rise of Fitbit and other exercise tracking apps, getting healthy has become more visible than ever. But is it advisable to include pets in such activities? Dr. Ernie Ward, a bona fide fitness freak, explains why now is a better time than ever to enlist furry workout buddies.



Scan the codes below to get these tools instantly. No scanner? No problem. Visit dvm360.com/obesityessentials.



ESSENTIALS: OBESITY

Monitoring weight loss in obese pets: *A shared* responsibility

Monitoring is an important part of a successful weight loss program—and it requires the pet owner's cooperation, says Jane Armstrong, DVM, MS, MBA, DACVIM. To increase the chances of the program's success, owners need to be accountable, she says.

When starting a patient's weight loss program, Dr. Armstrong advises that you schedule recheck appointments every two weeks until a weight loss trend is achieved, then monthly for the next six to 12 months.

Warn owners at the beginning of the program that weight loss isn't linear. There will be plateaus when weight loss levels off, and you may need to make adjustments in the feeding program.

A pet may have not reached its target weight when you and the owner decide to transition the weight loss program to the maintenance phase. The goal for weight reduction is rarely to achieve some cosmetic "ideal" body condition score, but rather to reduce the morbidity associated with obesity and improve the quality of the animal's life. Rechecks are recommended every three months for one year to help support patients through the maintenance phase.

Much about implementing

weight loss programs has less to do with the pets and more to do with supporting owners and helping them change their behaviors. And don't forget: veterinary technicians can play an important role in helping set up a weight loss program, in monitoring at recheck visits and by phone, and in coaching and supporting owners to change their behaviors.

Getting in shape

It's common to think dogs that lie around are just lazy, making it easy to overlook the lethargy that results from being overweight or obese. Give clients these tips to get dogs in shape—scan the codes below to download.



The top **3** ways you can make life *easier* for the owners of diabetic pets

Caring for a diabetic cat is a formidable job—even for endocrinology expert Ellen N. Behrend, VMD, MS, PhD, DACVIM. Owning a diabetic cat gave her insights into how best to manage diabetic cats at home.

1 The quicker diabetes is controlled, the more likely remission will occur.

In a study evaluating remission in diabetic cats initially treated with insulin, 55 diabetic cats were included whose own-

ers followed a highly intensive monitoring and blood glucose regulation protocol using insulin glargine and a low carbohydrate diet.¹ Remission was achieved in 35 cats (64%). Cats that had received glucocorticoid treatment within six months prior to a diagnosis of diabetes mellitus, that required a lower maximum insulin dose, or that were intensively managed using glargine within six months of diagnosis were more likely to achieve remission, while cats with a peripheral neuropathy present at diagnosis (such as difficulty climbing stairs or a plantigrade stance) were less likely to do so.

2 Diet is important, and canned food is preferred.

Veterinary low carbohydrate-high protein thera-

peutic diets such as Purina Veterinary Diets DM (Nestlé Purina) or Prescription Diet m/d (Hill's Pet Nutrition) are the first-choice dietary recommendation in most cats with diabetes mellitus.²⁻⁴ However, a carefully selected over-the-counter high protein-low carbohydrate diet can provide the same degree of effective glycemic control as therapeutic diets do when financial constraints are present or when a cat will not readily eat a veterinary therapeutic diet.⁵ Many canned over-the-counter diets are relatively low in carbohydrate content (< 5 g/100 kcal), but information must be obtained from the manufacturer on specific brands and flavors to ensure that the goal nutrient composition is being met. Most dry over-the-counter diets are higher in carbohydrate con-



Everything you need...

We've gathered our best content on diagnosing and managing your patients with diabetes mellitus. You'll find tips on which insulin to use, how to best monitor glucose control, and how best to discuss diabetes with pet owners at dvm360.com/diabetesessentials.

ESSENTIALS: DIABETES

tent. Thus, if a therapeutic dry veterinary low carbohydrate-high protein diet is not an option, it may, unfortunately, be more difficult to identify a good-quality dry food with low carbohydrate content.

3 Make giving insulin part of a pleasant experience for the cat—and the owner.

Insulin syringes, are essential partly because of the small needle size, but a needle prick can still be an unpleasant sensation. A good practice is to make the injections part of a good experience. For diabetic pets that are meal-fed and enjoy their food, inject them as they are eating and when they are close to finishing the

meal. For others, owners can give the injections while doing a pleasurable activity. My cat Madison loved getting brushed every day. When he became diabetic, I started brushing him twice daily, and I gave him the injection midway through each brushing.

The site of insulin injection is important. An appropriate location must be chosen, as absorption of insulin from various sites in the body differs. In dogs and cats, the dorsal neck, or the scruff, has commonly been used as an injection site, but this location may not be ideal because of low blood flow and increased fibrosis caused by repeated injections. A better option may be to administer the insulin

along the lateral abdomen and thorax. The chosen area should be rotated daily to prevent fibrosis at an injection site.⁶

What are the best insulin options to control diabetes in dogs?

David Bruyette, DVM, DACVIM, discusses insulin products and offers his recommendations on how best to use each one. Hear his thoughts in this video—scan to watch now.



My pet has diabetes—now what?!

Diabetes doesn't mean a pet can't have a good quality of life. Here are two free handouts developed by Dr. David Bruyette, a board-certified veterinary internal medicine specialist, that will help pet owners learn more a diabetes diagnosis in their pet. Scan the code to download now.



Helpful hints for canine atopy: Immunotherapy

Dr. Alice Jeromin, pharmacist and veterinary dermatologist, on how to alleviate the itch in your patients.

Allergy problems are never easy, and in most cases they are there for the long term. Establishing a safe, long-term method of treating these atopic patients is essential in order to provide them with a good quality of life. As mentioned above, topicals such as shampoos and ceramide replacers, diet changes and good communication are small ways of enhancing a pet's response to a long-term therapy.

If you are using immuno-

therapy, either injectable or sublingual, remember that flare-ups are not unusual. Owners must be made aware of this as they often have high expectations that the immunotherapy will take care of everything.

Sublingual immunotherapy for atopic dogs has recently become available. It has a similar success rate to injectable immunotherapy (60 percent to 75 percent) and offers ad-

vantages in that it is available as oral drops, can be effective in three to six months, does not need refrigeration, and anaphylaxis is not commonly seen (it is reported in 1 percent or fewer

Itching for more?

The itch. The scratch. The irritation. Atopic dermatitis is likely one of the most common dermatologic problems you see in veterinary practice. We at dvm360 have curated our best, most informative articles about this topic to help you diagnose and treat it efficiently and effectively. And we'll keep you on top of new developments as they arise.

Find more tools ...

No scanner? No worries. Get these tools and more by visiting dvm360.com/atopyessentials.



ESSENTIALS: ATOPIC DERMATITIS

pointers

of injectable immunotherapy patients).

My clinic has been using sublingual immunotherapy in patients for more than a year with good results. But as with any type of immunotherapy, nothing is “cookie cutter.”

Individual patients will vary with their response, ranging from the initial vial being too strong (causing more pruritus) to some patients being maintained on the lower-strength vials and not having to proceed according to schedule.

Just keep in mind that once

immunotherapy is dispensed, individual monitoring is essential, and the owner should be checking in routinely or notifying you of any increase in pruritus or flare-up of otitis or bacterial pyoderma. Clients often mention to me that immunotherapy solutions are dispensed to them without any follow-up or reactions to watch for. Even though instructions are available with the immunotherapy, it is essential for you or a member of your staff to sit down and go over instructions—what to watch for and how often or when to contact your office.

For more from this article, visit dvm360.com/atopyessentials.

Key history findings that point to atopy



Gathering a good history is a vital part of diagnosis when it comes to itchy pets. (You can download a comprehensive dermatology history form at dvm360.com/dermhistory.) In this audio clip, veterinary dermatologist Dr. Douglas DeBoer pinpoints the clues you'll gather from a pet's dermatologic history that should set off red flags for this atopic dermatitis.



Trippingly under the tongue: Sublingual immunotherapy



Veterinary dermatologist Dr. Tom Lewis recounts his own struggles with injectable immunotherapy for his dog with atopic dermatitis and how the sublingual option is not only beneficial in that there are no longer painful needlesticks, but because it works faster, some patients respond better and much more—all in the video below.





Home alone

Frantic dogs. Frazzled owners.

Short of recommending that your veterinary clients stay home 24/7 or take their dog everywhere, how can you help prevent or manage separation anxiety? Try these tools.

Treatment of separation anxiety is rarely easy; it requires patience, persistence, and dedication on the owner's part. It is a condition that can often be managed even when it cannot be completely cured. And it is likely to be more easily treated if help is sought as soon after the appearance of clinical signs as possible, since the condition is likely to worsen with time.



In-depth: Using clonidine and trazodone for anxiety-based behavior disorders in dogs

For some behavior patients, the anti-anxiety effects of a single drug might not be enough. In cases in which monotherapy is insufficient, consider adding one of these drugs to your treatment plan. *Veterinary Medicine* goes in-depth with the latest research—for more, head over to dvm360.com/anxietyessentials.



Client handout: Signs of separation anxiety in dogs

John Ciribassi, DVM, DACVB, says that the goal of treating separation anxiety is to reduce a dog's dependence on its owners, and this greater sense of independence can be accomplished with a variety of

behavior modification activities often in conjunction with antianxiety drugs. To get the conversation started, try using this free handout. Scan the QR code, below, to download the handout instantly.



Audio: Differential diagnoses for separation anxiety in dogs



Suspect that one of your canine patients is suffering from separation anxiety? Veterinary behaviorist Dr. John Ciribassi discusses the various medical and alternative behavioral diagnoses that might also result in separation anxiety. Scan the code, right, or go to dvm360.com/anxietyessentials for more on this topic.



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Out-of-the-blue diet and nutrition queries:

Pick your battles carefully

Unsure of the best way to counsel your client on nutrition? Simplify the conversation with these three questions. *By Rebecca Remillard, PhD, DVM, DACVN*

One look at the shelves in any pet store can overwhelm you with the sheer number of brands and dietary options available to pet owners.

Practically speaking, there is no way to keep up with new products while also taking the critical step of staying on top of all the recalls. However, you can simplify your nutritional assessment of a client's questions or statements concerning pet food products by asking just three questions (see "3 simple questions" on the next page). Let's look at these questions one at a time.

Question 1: Is the product claim complete and balanced?

Let the American Association of Feed Control Officials (AAFCO) statement become your new best friend. Why?

This statement lets you know right off the bat whether the food is nutritionally complete and balanced and can be fed as a sole source of nutrition. An AAFCO statement is required on every pet food label sold in the United States, except if the food is made or sold only in Arkansas or Nevada

or is clearly labeled as a treat, snack or supplement.

The AAFCO statement is the most important preliminary piece of information on the label (not the ingredient list) when assessing the diet for a particular patient. You will see one of three types of statements on a pet food label:

1. Nutritionally complete and balanced (or perfect, scientific, 100% nutritious)—this diet is known or shown to be nutritionally complete.
2. For supplemental or intermittent feeding only—this diet is assumed or known to be nutritionally incomplete as a sole source of nutrition for an extended period of time. Specific clinical signs associated with deficiency or toxicity and the timing of their appearance cannot be predicted but depend on the first limiting nutrient and magnitude of the variance from the recommended level. A routine serum chemistry profile or complete blood count does not test for specific nutritional imbalances.
3. Feed under the supervision or direction of a veterinarian—this is seen on therapeutic dietary products. Many have passed AAFCO protocol feeding trials but use a veterinarian-only label.

However, you only need to distinguish between option 1 and 2: Is the diet nutritionally complete and balanced, or not? If it is, you're done on question 1 and the food is sufficient for feeding as a sole source of nutrition. If not, you





3 SIMPLE QUESTIONS

to ask when assessing unfamiliar diets fed to your patients

Does the product claim to be nutritionally complete and balanced?

Yes You are done on this point because the diet is sufficient for long-term feeding.

No Help the client find a food that claims to be complete and balanced according to AAFCO or National Research Council.

Would this particular nutrient profile harm my patient?

Yes Explain why the nutrient content is inappropriate for this pet

No The diet is appropriate for this pet.

Is this a food safety issue?

Yes Explain that the product is on the recall list and make a recommendation on how to monitor the pet.

No The diet is apparently safe to feed. However, you may want to voice your own opinion if the diet contains raw meat, eggs or bones.

need to explain this to the pet owner, which should not be too difficult: “There is no guarantee the diet contains all the nutrients known to be essential to a dog or cat.”

Exception—homemade diets. The AAFCO statement cannot help you here. A pet

owner survey has shown that 21% of dog owner and 15% of cat owners feed human food or a homemade diet.¹ Home-prepared diets do not carry any nutritional adequacy statement because they are not sold as a product—only as a recipe. Recipes are readily available from a variety of sources and so-called “experts.” A quick Google search will give your client myriad recipes, but only veterinarians and nutritionists are held accountable for their recommendations. Keep in mind that 95% of 200 home-made diet recipes published or located online were found to be nutritionally inadequate.²

Two additional major areas of concern with homemade diets:

1. Is the nutrient profile appropriate for the pet’s species, life stage and body weight or body condition score?
2. Does the client make the recipe according to original instructions, and keep doing so?

Each of these problems has been documented to cause malnutrition in pets.³⁻⁷

Checking the nutritional adequacy of recipes is not a simple task and beyond the skill set of and time available to most practitioners to do correctly because software, formulation skills, nutritional knowledge and access to ingredients databases are required. Therefore, practitioners should be willing to:

- Briefly assess the recipe for five key nutrient sources and refer if needed⁸:

—**Protein source**—The diet should contain 25 to 30 percent cooked skeletal meat for dogs (one part meat to two or three parts grain) and 35 to 50 percent cooked skeletal or organ meat for cats.

—**Carbohydrate source**—Optimal grain-to-meat ratios should be at least 2:1 to 3:1 for dog foods and 1:1 to 2:1 for cat foods. Cooked corn, rice, wheat, potato or barley are more than 85 percent digested by both dogs and cats.^{9,10}

—**Fat source**—Only 1 percent is needed to meet the essential fatty acid requirement; an animal source is best.

—**Calcium source**—A specific calcium supplement (with little or no phosphorus) is essential.

—**Multivitamin and trace mineral source**—This cannot be met with “whole” foods such as fruits and vegetables because pets can simply not consume enough vegetable material to meet the stated recommendations. Synthetic supplements are required to ensure a complete diet.

- Offer known nutritionally adequate recipes. Resources are available online at balanceit.com, cuisine-a-crocs.com and petdiets.com. You can also seek advice from a veterinary nutritionist at acvn.org or aavn.org.

What about feeding raw meat or eggs?

Two health issues are at stake here:

1. **Nutritional integrity**—raw food diets have several names but can be grouped by source:
 - **Homemade**, which are usually not complete or balanced²; these diets should be checked by a nutritionist.
 - **Commercial**—very few are sold as “complete and balanced”; most are “for supplemental or intermittent feeding”
2. **Food safety**—There are now several consensus statements that cannot be ignored¹²:
 - American Animal Hospital Association: Raw protein diet, available at aaha.org/professional/resources; AAHA’s statement has been subsequently endorsed by The American Association of Feline Practitioners and the National Association of State Public Health Veterinarians
 - American Veterinary Medical Association: Raw or undercooked animal-source protein in cat and dog diets, available at www.avma.org/kb/policies
 - California Veterinary Medical Association: Policy on raw or undercooked animal-source protein in cat and dog diets, available at cvma.net.

Diet drift. Once the homemade diet has been documented as nutritionally sound, it is important that the recipe specifics be maintained in the medical record and reviewed on a regular basis with the owner (i.e. control diet drift). Food substitutions are usually possible, but first consult the author of the recipe.

Boarded veterinary nutritionists, like other veterinary specialists, have advanced training and can be of particular assistance with homemade diets. Checking and correcting nutritional imbalances are generally not difficult for nutritionists; hence, most recipes can be complete and balanced if the owner insists on feeding a particular food.

Question 2: Would this nutrient profile harm my patient?

If a diet is nutritionally complete and balanced, embedded in the AAFCO complete and balanced statement on the label will be the species and life stage. Match up the information with your patient:

- > Species—Canine or feline must be named. Some products are sold as one for both (e.g. foods sold for “all dog and cat life stages”).
- > Life stage—There are only three life stage claims possible: 1) growth-gestation-lactation, 2) adult or maintenance, and 3) all life stages

The latter claim sounds very convenient, but these diets are designed for growth. The most common mismatch is an owner feeding an “all life stage” food to a middle-aged, neutered dog of an obese-prone breed or an indoor, middle-aged, neutered cat with a body condition score greater than 6/9. In these cases, the nutrient profile (fat and calorie content) is not appropriate for the patient. Be sure to help owners determine whether such products are inappropriate for their pets and help them select a more appropriate product to maintain a healthier weight and improve longevity.¹¹

Question 3: Is this a food safety issue?

Once the nutritional adequacy statement has been checked on a particular product, it is unlikely to change unless recalled for a formulation error or potential contaminate. If this occurs, it should appear on the FDA pet food recall list. Pet food product recalls are now required within 24 hours of a possible or known problem (Food Safety and Modernization Act, 2012) and listed on the recall list.

Name dropping a familiar pet food or manufacturer does not preclude formulation errors. There were more than 30 recalls in 2013, and some of the products were from major pet food companies. Also beware of



Nutrition Q&A

Scan the QR code or visit dvm360.com/DietCuriosities to hear Dr. Remillard tackle nutrition issues from everyday practice.

companies that claim to never have had a recall as they may not be testing their products.

Conclusion

Nutritional counseling should be an important part of every wellness visit. The good news is that it doesn't have to be a long or difficult discussion, and veterinarians can be a reliable and trusted nutritional authority for clients. One easy action step is to train your technical staff to ask about diet when gathering a history and then use online product websites to determine the answers to these three questions for you even before you go in the room so you will be prepared to give your client the best recommendations.

See the three simple questions outlined in this article in action by turning the page and working through two case examples. **VM**

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Thoughts from the trenches

Get fellow practitioner Dr. Sarah Wooten's point of view on homemade diets at dvm360.com/WootenDiet.



View the references for this article at dvm360.com/DietQs.



CASE EXAMPLE #1:

Not much information in the product name

Client: "I am interested in that new highly sustainable diet called the New Age Professional Earthworm Formula. What do you think?"

You: "Does the product claim to be nutritionally complete and balanced?"

Client: "Yes, it claims to be complete and balanced according to AAFCO."

Excellent! Let's move to question 2.

Would this particular nutrient profile harm my patient?

You: "What is the species and life stage in the AAFCO statement?"

Client: "Well it mentions maintenance adult dogs."

The client has a 4-year-old neutered healthy dog with a body condition score of 5/9. All A-OK. Time for the final question.

Is this a food safety issue?

You: "How is this product sold—kibble, canned, raw, freeze-dried, frozen or dehydrated?"

Client: "It's a new canned food."

You pull up the FDA Pet Food Recall list from your browser's favorites, and seeing that it is not listed, you would have to conclude that the product is worthy of a food trial. You could suggest the dog try the diet for 30 days, making clear that with any changes in the dog's appetite, activity, attitude, gastrointestinal function or habits or weight, you would like her to contact you.

CASE EXAMPLE #2:

Lifestyle issues versus nutritional issues

Client: "I have been feeding a diet that uses all-natural organic ingredients with nothing from China and no GMO corn, wheat or gluten, but I forgot the name of it, so let me find it on my phone."

You: "Does the product claim to be nutritionally complete and balanced?"

Client: "Yes, it says it's complete and balanced according to AAFCO."

Great! On to question 2.

Would this particular nutrient profile harm my patient?

You: "What is the species and life stage in the AAFCO statement?"

Client: "Well it says for all life stages of the cat."

You see the client has a 14-year-old neutered cat with a body condition score of 8/9 and a history of being at an International Renal Interest Society (IRIS) Stage 2 for chronic kidney disease. Warning flags of a mismatch are raised. The diet may not be a great choice for this pet. Let's check question 3.

Is this a food safety issue?

You: "How is this product sold—kibble, canned, raw, freeze-dried, frozen or dehydrated?"

Client: "It's a dry food."

You have a technician check the FDA Pet Food Recall list and do not find it on the list, so question 2 remains to be discussed:

- The claims of natural organic ingredients and nothing from China and no GMO corn, wheat or gluten are lifestyle issues that do not affect the nutrient profile of the product.
- The mismatch here is feeding a cat food designed for growing kittens to an older overweight IRIS stage 2 adult cat: The protein and phosphorous concentrations for feline growth exceed those recommended for feline renal disease. In addition, the high fat and caloric density are not appropriate for a body condition score > 6/9. It's best to help the client select a different diet.



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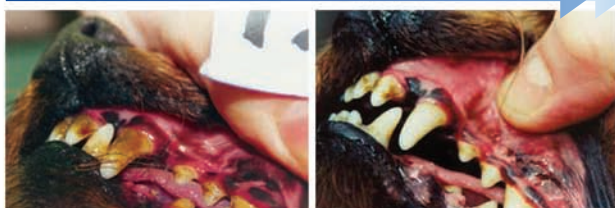
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