



Fall 2003

REVIEW

The Critical Care

FLORIDA VETERINARY SPECIALISTS
& Cancer Treatment Center

AVIAN/EXOTIC

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Diplomate ABVP (Avian)

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Soraya Juarbe-Diaz, DVM
Diplomate ACVB

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Dipl. ACVIM, ACVECC

Rita Hanel, DVM
Diplomate ACVIM

Joshua Parra, DVM
Limited to Critical Care

DERMATOLOGY

Heather Willis-Goulet, DVM
Diplomate ACVD

Nadine Znajda, DVM
Limited to Dermatology

EMERGENCY MEDICINE

Lee Burstiner, DVM
Diplomate ABVP

Tamara Berlin, DVM

Krysta Deitz, DVM

Sonja Olson, DVM

INTERNAL MEDICINE

Marcel Aumann, DMV
Dipl. ACVIM, ACVECC

Erick Mears, DVM
Diplomate ACVIM

Neil Shaw, DVM
Diplomate ACVIM

Curtis Kane, DVM
Limited to Internal Med.

NEUROLOGY

John Meeks, DVM
Dipl. ACVIM (Neuro.)

ONCOLOGY AND RADIATION ONCOLOGY

Tracy LaDue, DVM
Dipl. ACVIM (Onc.)
Dipl. ACVR (Rad. Onc.)

Amy LeBlanc, DVM
Dipl. ACVIM (Onc.)

OPHTHALMOLOGY

Kathleen Barrie, DVM
Diplomate ACVO

Michele Stengard, DVM
Diplomate ACVO

RADIOLOGY

Valerie Sadler, DVM
Diplomate ACVR

SURGERY

Helga Bleyaert, VMD
Diplomate ACVS

Mark Levy, DVM
Diplomate ACVS

Practice Update

.....
by Neil Shaw, D.V.M., Diplomate ACVIM



Dear Colleagues,

I am pleased to announce wonderful news. Dr's Tracy Ladue and John Meeks welcomed their new son, Carter, into the world in June. Dr. Helga Bleyaert and her husband, Jim, welcomed their second daughter, Darby, in September. It is a joy to watch our families grow.

Congratulations to Dr. Amy LeBlanc (formerly Hipple), Diplomate of the American College of Veterinary Medicine (Oncology) for both passing her boards and getting married within a span of four weeks. After soaring over those hurdles, life may become too calm. We're going to have to come up with some hobbies for Amy and her husband Casey.

Dr. Heather Willis-Goulet, Diplomate of the American College of Veterinary Dermatology, has joined Dr. Nadine Zznada on the Dermatology service. The addition of Dr. Willis-Goulet has certainly increased the availability of referral Dermatology appointments. Heather, originally from Massachusetts, has moved to Tampa with her husband Craig after completing her residency at the University of Florida College of Veterinary Medicine.

Continued on page 5



Oncology Update

by Amy LeBlanc, D.V.M., Diplomate ACVIM

CANINE MAST CELL CANCER

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Associate Staff

Amy Baker, DVM
Heather Brownell, DVM
Amy Dilger, DVM
Autumn Dutelle, DVM
Andrea Flory, DVM
Jessica Lawrence, DVM
Holly Moore, DVM
Alexis Moreno, DVM
Erin Romansik, DVM
Luminita Sarbu, DVM



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I think we'd all agree that canine mast cell tumor (MCT) is one of the most common oncologic diagnoses made in small animal practice. Tumors affecting the skin are often removed with surgery, with or without preoperative fine needle aspiration cytology, and are submitted for histopathology. After the grade and margins are reported by the pathologist, we are left with the dilemma of what to do next. The benign Grade I and exceptionally aggressive Grade III tumors are fairly rare compared to the Grade II tumors. One of the most common questions we are asked during consultations is regarding the 'completely' excised Grade II mast cell tumor: is additional testing or therapy necessary? What guidelines should we use to make recommendations to our clients?

The current veterinary literature reports an approximate 20% risk of recurrence either within the surgical site or at a distant skin location with Grade II tumors. This reflects an improvement in the surgical management of this disease, as the older literature reported a 50% recurrence within 6 months of the initial surgery. We recognize that fine needle aspiration cytology used preoperatively and subsequent wider surgical margins provide a greater chance of local control. However, a pathologist cannot examine every millimeter of the excised specimen, which indicates that some tumors may not really be 'completely' removed.

Of additional concern is the moderate metastatic potential of Grade II mast cell tumors. The exceptionally low (< 10%) and high (75-90%) metastatic rates of Grade I and Grade III tumors, respectively, are well documented in clinical experience and literature. A challenge for us in veterinary oncology is how to predict the behavior of a Grade II tumor. We all agree that additional local therapy (i.e. surgery or radiation therapy) is indicated for incompletely excised tumors, but which dogs need adjuvant therapy when the tumor appears completely excised? Which dogs need chemotherapy?

We rely on several prognostic factors, in addition to the results of staging tests, to help our clients select the best course of action for their pet. Staging the disease by carefully evaluating the regional lymph nodes, liver, spleen and bone marrow allows us to correctly identify the need for local and/or systemic treatment. Aggressive biologic behavior is observed with tumors that are grossly recurrent, located in the oral cavity or on the genitalia, or those in certain breeds like the Shar Pei or Labrador Retriever. Conversely, the boxer breed typically has disease that is usually multifocal in nature and less likely to metastasize.

Chemotherapy is indicated if metastatic disease is identified during staging, the tumor is in an unfavorable location, or the disease is multifocal at presentation. Radiation therapy is indicated for a single completely or incompletely excised tumor with inclusion of the regional lymph node as prophylaxis. Interestingly,

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So, if you like the results of the Challenge worksheet, step up to a healthy practice with ProHeart 6. Call your Fort Dodge Animal Health representative today.

ProHeart 6 is generally well tolerated. Use with caution in sick, debilitated or underweight animals. A small percentage of dogs showed mild, transient swelling or itching at the injection site.

While rare, digestive, neurological or hypersensitivity reactions may occur. See the following page for prescribing information, or call **1-800-533-8536**.



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ProHeart[®] 6 (moxidectin)

Sustained Release Injectable for Dogs

CAUTION Federal (U.S.A.) law restricts this drug to use by or on the order of a licensed veterinarian.

DESCRIPTION ProHeart 6 (moxidectin) Sustained Release Injectable consists of two separate vials. Vial 1 contains 10% moxidectin sterile microspheres and Vial 2 contains a specifically formulated sterile vehicle for constitution with Vial 1. No other diluent should be used. A clear or translucent appearance of the vehicle is normal. Each mL of constituted drug product contains 3.4 mg moxidectin, 3.1% glyceryl tristearate, 2.4% hydroxypropyl methylcellulose, 0.87% sodium chloride, 0.17% methylparaben, 0.02% propylparaben and 0.001% butylated hydroxytoluene. Hydrochloric acid is used to adjust pH.

PHARMACOLOGICAL Moxidectin is a semi-synthetic, methoxime derivative of nematode which is a fermentation product of *Streptomyces cyanogriseus* subsp. *nancyangensis*. Moxidectin is a pentacyclic, 16-membered lactone macrolide.

Moxidectin has activity resulting in paralysis and death of affected parasites. The stage of the canine heartworm affected at the recommended dose rate of 0.17 mg moxidectin/kg body weight is the tissue larval stage. The larval and adult stages of the canine hookworms, *Ancylostoma caninum* and *Uncinaria stenocephala*, are susceptible.

Following injection with ProHeart 6, peak moxidectin blood levels will be observed approximately 7-14 days after treatment. At the end of the six month dosing interval, residual drug concentrations are negligible. Accordingly, little or no drug accumulation is expected to occur with repeated administrations.

INDICATIONS ProHeart 6 is indicated for use in dogs six months of age and older for the prevention of heartworm disease caused by *Dirofilaria immitis*.

ProHeart 6 is indicated for the treatment of existing larval and adult hookworm (*Ancylostoma caninum* and *Uncinaria stenocephala*) infections.

DOSE AND ADMINISTRATION Frequency of Treatment: ProHeart 6 prevents infection by *D. immitis* for six months. It should be administered within one month of the dog's first exposure to mosquitoes. Follow-up treatments may be given every six months if the dog has continued exposure to mosquitoes.

When replacing another heartworm preventive product, ProHeart 6 should be given within one month of the last dose of the former medication. ProHeart 6 eliminates the larval and adult stages of *A. caninum* and *U. stenocephala* present at the time of treatment. However, persistent effectiveness has not been established for this indication. Re-infection with *A. caninum* and *U. stenocephala* may occur sooner than 6 months.

Dose: The recommended subcutaneous dose is 0.05 mL of the constituted suspension/kg body weight (0.0227 mL/lb). This amount of suspension will provide 0.17 mg moxidectin/kg bodyweight (0.0773 mg/lb). To ensure accurate dosing, calculate each dose based on the dog's weight at the time of treatment. Do not overdose growing puppies in anticipation of their expected adult weight. The following dosage chart may be used as a guide.

Dog Wt.		Dose Volume	Dog Wt.		Dose Volume
lb	kg	mL/Dog	lb	kg	mL/Dog
11	5	0.25	77	35	1.75
22	10	0.50	88	40	2.00
33	15	0.75	99	45	2.25
44	20	1.00	110	50	2.50
55	25	1.25	121	55	2.75
66	30	1.50	132	60	3.00

Injection Technique: The two-part sustained release product must be mixed at least 30 minutes prior to the intended time of use (See **CONSTITUTION PROCEDURES** for initial mixing instructions). Once constituted, swirl the bottle gently before every use to uniformly re-suspend the microspheres. Withdraw 0.05 mL of suspension/kg body weight into an appropriately sized syringe fitted with an 18G or 20G hypodermic needle. Dose promptly after drawing into dosing syringe. If administration is delayed, gently roll the dosing syringe prior to injection to maintain a uniform suspension and accurate dosing.

Using aseptic technique, inject the product subcutaneously in the left or right side of the dorsum of the neck cranial to the scapula. No more than 3 mL should be administered in a single site. The location(s) of each injection (left or right side) should be noted so that prior injection sites can be identified and the next injection can be administered on the opposite side.

CONTRAINDICATIONS ProHeart 6 is contraindicated in animals previously found to be hypersensitive to this drug.

HUMAN WARNINGS Not for human use. Keep this and all drugs out of the reach of children.

May be slightly irritating to the eyes. May cause slight irritation to the upper respiratory tract if inhaled. May be harmful if swallowed. If contact with the eyes occurs, rinse thoroughly with water for 15 minutes and immediately seek medical attention. If accidental ingestion occurs, contact a Poison Control Center or a physician immediately. The material safety data sheet (MSDS) contains more detailed occupational safety information.

PRECAUTIONS Use with caution in sick, debilitated or underweight animals (see **SAFETY**).

ProHeart 6 should not be used more frequently than every 6 months. The safety and effectiveness of ProHeart 6 has not been evaluated in dogs less than 6 months of age. Prior to administration of ProHeart 6, dogs should be tested for existing heartworm infections. Infected dogs should be treated to remove adult heartworms. ProHeart 6 is not effective against adult *D. immitis* and while the number of circulating microfilariae may decrease following treatment, ProHeart 6 is not effective for microfilariae clearance.

ADVERSE REACTIONS In field studies, the following adverse reactions were observed in approximately 1% of 280 dogs treated with ProHeart 6: vomiting, diarrhea, listlessness, weight loss, seizures, injection site pruritus, and elevated body temperature.

Post-Approval Experience: Although not all adverse reactions are reported, the following reactions are based on voluntary post-approval drug experience reporting: anaphylaxis/food reactions, depression/ lethargy, urticaria, and headfacial edema. Anaphylactic and anaphylactoid reactions should be treated immediately with the same measures used to treat hypersensitivity reactions to vaccines and other injectable products. Cardiopulmonary signs such as coughing and dyspnea may occur in heartworm-positive dogs treated with ProHeart 6.

To report suspected adverse reactions or to obtain technical assistance, call (800) 533-8536.

ANIMAL SAFETY General Safety: ProHeart 6 has been safely administered to a wide variety of healthy dogs six months of age and older, including a wide variety of breeds, pregnant and lactating females, breeding males, and ivermectin-sensitive collies. However, in clinical studies, two geriatric dogs with a history of weight loss after the initial ProHeart 6 injection died within a month of the second 6 month injection. A third dog who was underweight for its age and breed and who had a history of congenital problems experienced lethargy following the initial injection of ProHeart 6. The dog never recovered and died 3 months later (see **PRECAUTIONS**).

ProHeart 6 administered 3 times the recommended dose in dogs with patent heartworm infections and up to 2 times the recommended dose in ivermectin-sensitive collies did not cause any adverse reactions. ProHeart 6 administered 3 times the recommended dose did not adversely affect the reproductive performance of male or female dogs. ProHeart 6 administered up to 5 times the recommended dose in 7-8 month old puppies did not cause any systemic adverse effects.

In well controlled clinical field studies, ProHeart 6 was safely used in conjunction with a variety of veterinary products including vaccines, anthelmintics, antiparasitics, antibiotics, analgesics, steroids, non-steroidal anti-inflammatory drugs (NSAIDs), anesthetics and flea control products.

Injection Site Reactions: Injection site observations were recorded during effectiveness and safety studies. In clinical studies, ProHeart 6 was administered at six-month intervals to client-owned dogs under field conditions. There were no reports of injection site reactions in these field studies and evaluations of the injection sites revealed no abnormalities.

In a laboratory safety study, ProHeart 6 was administered at 1, 3 and 5 times the recommended dose to 7-8 month old puppies. Injection sites were clipped to facilitate observation. Slight swelling/edema at the injection site was observed in some dogs from all treated groups. These injection site reactions appeared as quickly as 8 hours post injection and lasted up to 3 weeks. A three-year repeated injection study was conducted to evaluate the safety of up to 6 injections of ProHeart 6 administered at the recommended dose (0.17 mg/kg) every 6 months. Mild erythema and localized deep subcuticular thickening were seen in dogs that received four injections in the same area on the neck and in one dog that received two injections in the same area on the neck. Microscopic evaluation on the injection sites from all dogs 6 months after the last injection consistently showed mild granulomatous panniculitis with microvascularization. The only adverse reaction seen that was not related to the injection site was weight loss in one dog.

Some dogs treated with ProHeart 6 in laboratory effectiveness studies developed transient, localized inflammatory injection site reactions. These injection site reactions were visible grossly for up to 3 weeks after injection. Histologically, well-defined granulomas were observed in some dogs at approximately 5 months after injection.

CONSTITUTION PROCEDURES The two-part ProHeart 6 product must be mixed at least 30 minutes prior to the intended time of use. Items needed to constitute ProHeart 6:

- Microspheres (vial 1)
- Sterile 20 mL syringe for transfer
- Vehicle (vial 2)
- Enclosed vent needle (25G)
- Transfer needle (18G or 20G)



- Constitution of the 20 mL vial product.
1. Shake the microsphere vial to break up any aggregates prior to constitution. The microspheres and vehicle will gradually separate on standing.
 2. Using an 18G or 20G needle and sterile syringe withdraw 17.0 mL of the unique vehicle from the vial. There is more vehicle supplied than the 17.0 mL required.
 3. Insert the enclosed 25G vent needle into the microsphere vial.
 4. Slowly transfer the vehicle into the microsphere vial through the stopper using the transfer needle and syringe.
 5. Once the vehicle has been added, remove the vent and transfer needles from the microsphere vial. Discard unused vehicle and needles.
 6. Shake the microsphere vial vigorously until a thoroughly mixed suspension is produced.
 7. Record the time and date of mixing on the microsphere vial.
 8. Allow suspension to stand for at least 30 minutes to allow large air bubbles to dissipate.
 9. Before every use, gently swirl the mixture to achieve uniform suspension. The microspheres and vehicle will gradually separate on standing.
 10. Use a 1 mL or 3 mL syringe and an 18G or 20G needle for dosing. Dose promptly after drawing into dosing syringe. If administration is delayed, gently roll the dosing syringe prior to injection to maintain a uniform suspension and accurate dosing.
 11. Refrigerate the unused product. The constituted product remains stable for 4 weeks in a refrigerator. Avoid direct sunlight.

STORAGE INFORMATION Store the unconstituted product at or below 25°C (77°F). Do not expose to light for extended periods of time. After constitution, the product is stable for 4 weeks stored under refrigeration at 2° to 8°C (36° to 46°F).

HOW SUPPLIED ProHeart 6 is available in the following two package sizes.

1. **5-Pack**
 - NDC 0856-3670-25 – 20 mL vial product:
 - 5 – 10% moxidectin sterile microspheres – 598 mg/vial
 - 5 – Sterile vehicle – 17 mL/vial
2. **10-Pack**
 - NDC 0856-3670-29 – 20 mL vial product:
 - 10 – 10% moxidectin sterile microspheres – 598 mg/vial
 - 10 – Sterile vehicle – 17 mL/vial

For customer service, product information or to obtain a copy of the MSDS, call (800) 685-5656. U.S. Patent No. 4,916,154 and 6,340,671



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We are pleased to welcome back **Dr. Rita Hanel**, Diplomate of the American College of Veterinary Internal Medicine. Many of you may remember Rita from when she completed her internship and established the weekend critical care service in '98-'00 at Florida Veterinary Specialists. She now rejoins us after completing an internal medical residency at the University of Florida VMTH. Dr. Hanel has joined Dr. Josh Parra on the Critical Care service, providing you with 7-days / week availability for specialty emergency transfers.

Dr. Sonja Olson, joins us from Alexandria Veterinary Emergency Service in Alexandria, VA, as a senior emergency clinician. Dr. Olson completed her rotating internship at South Paws Veterinary Referral Hospital and has been practicing emergency medicine for 6 years. She is a dynamic and experienced clinician and a joy to be around. Sonja has already become somewhat of a local celebrity by hosting Ask-A-Vet on the Tampa Bay Fox television affiliate. In addition to being a dynamo on the clinic floor, this adrenaline-junkie enjoys target shooting, motorcycle riding and teaches group body conditioning classes.

I am proud to report that five associates from FVS were accepted to academic residency training programs, including: Dr's Jen Locke and Hughes Lacoste, Oncology (Tufts and University of Illinois); Dr's Laura Riordin and Brad Green, Internal Medicine (University of Florida and University of Wisconsin); and Dr. Raimon Duran-Struuck, Laboratory Animal Medicine (Michigan State University). It was difficult to say goodbye, but we wish them the best of luck and success as future leaders in our profession.

It is our pleasure to provide specialty services for you. We strive to make the experience as positive as possible for the patient, the owner and you, the referring veterinarian. Please let me know if you have specific feedback or if there is something more that we can do for you. ■

recent literature supports definitive radiation therapy even when the regional node is positive for metastasis. Palliative radiation therapy can also be used in the face of gross metastasis to provide comfort to the pet.

In general, mast cell cancer is an unpredictable disease that should be managed aggressively at the time of diagnosis. Cure is generally not possible when metastatic disease is present, with dogs typically succumbing to the disease within 6-12 months of diagnosis. Clients should be made aware that their dog may develop new, unrelated mast cell tumors throughout their life. The FVS Oncology service is happy to answer your questions regarding individual patient management, and make specific recommendations regarding radiation therapy and chemotherapy for your clients. ■

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Animal Health

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Avian and Exotic Update

by Teresa Lightfoot, D.V.M., Diplomate ABVP (Avian)

GUINEA PIG G.I. - ORAL TO ANAL



Scurvy (Vitamin C Deficiency)

Although the absolute Vitamin C requirement of guinea pigs is widely known, clinical and subclinical scurvy is still very common. This can be attributed in many cases to the lability of Vitamin C and the false sense of security owners derive from feeding a Vitamin C enriched guinea pig pellet that has lost potency.

Since collagen is the main structure affected by Vitamin C deficiency, overt signs of disease will include hemorrhage and loosening of the teeth. Subclinical signs may mimic those of any other illness, or exacerbate existing disease. Therefore, treatment with injectable Vitamin C @ 50 mg/kg with continued oral supplementation at home at the same dose, is the recommended treatment. Response to therapy is often the method by which this condition is tentatively confirmed.

Malocclusion:

During the oral examination a green sludge of food is usually present in the oral cavity. This makes visualization of the dentition difficult and presents danger of aspiration when anesthesia is used. This material should be carefully swabbed from the pharynx once a light plane of anesthesia has been achieved.

Signs of dental disease include anorexia, ptyalism, and grinding of the teeth. Prior to this degree of affectation, the owner may notice that the pig is preferentially eating only certain foods, or chewing on one side of its mouth (tilting its head). Correction of dental disease follows the guidelines for rabbits. Factors specific to guinea pigs include:



- 1) Scurvy is a common underlying reason for malocclusion. The amount of tooth overgrowth showing above the gum lines may be minimal, but the angulation of the teeth due to the effects of Vitamin C deficiency may be severe. This author has recently seen three pigs with scurvy that had their tongues trapped beneath the lower molars as these molars overgrew medially. The tongue of these pigs could still protrude from the mouth, but movement was hindered and painful due to the overlying molars.



- 2) Guinea pigs also have a smaller oral cavity, with more redundant buccal mucosa than do rabbits, making access to the molars without causing trauma to the oral cavity more difficult.
- 3) The green sludge in the oral cavity provides a visual barrier and a concern with aspiration and hypoxia.

Gastrointestinal Disease

A common client misapprehension is that lack of stool production indicates constipation. Generally, it actually represents a decrease or absence of food intake. Enemas should not be given to guinea pigs unless radiographic evidence of obstipation is documented (which will be a rare occurrence).

Dysbiosis can occur in guinea pigs for the same reasons as it does in rabbits. Changes in diet or decreased food consumption, and inappropriate antibiotic administration are the primary offenders. Treatment follows the protocols outlined for rabbits, including analgesia (buprenorphine), rehydration, simethicone for gaseous distention, metoclopramide, Vitamin C supplementation, syringe feeding of appropriate product, such as Oxbow Critical Care for herbivores, and antibiotic therapy as indicated.

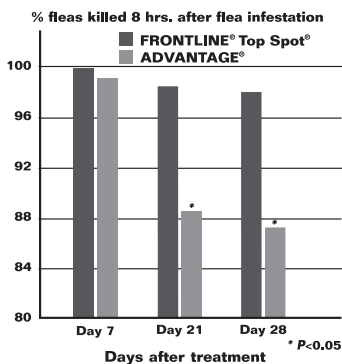
Note that both Clostridial and gram negative bacterial overgrowth may occur. Although not a definitive indicator of the gastric flora, a fecal gram stain may aid in the selection of antimicrobials. ■

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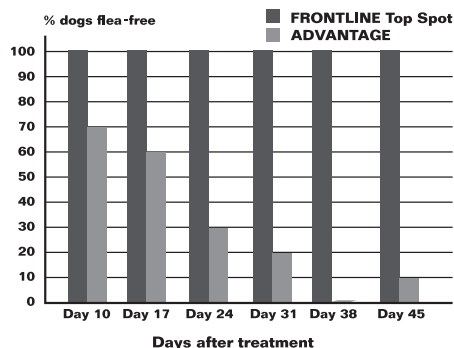


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64 dogs were allocated to 1 of 4 groups by treatment and counting time. Dogs were infested with approximately 105 unfed *Ctenocephalides felis* on days -7, -1, 7, 21, & 28. Dogs were treated on day 0.

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30 dogs were allocated to 1 of 3 groups (untreated controls, treated with FRONTLINE Top Spot, treated with ADVANTAGE). Dogs were infested with approximately 100 unfed adult fleas on Days -7, -1, 9, 16, 23, 30, 37 and 44. Dogs were treated on Day 0. Water immersion occurred on Days 3, 6, 13, 20 and 27. Fleas were comb counted and removed on Days -4, 1, 10, 17, 24, 31, 38 and 45.

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Internal Medicine Update

by Erick Mears, D.V.M., Diplomate ACVIM

FELINE HYPERTHYROIDISM



Hyperthyroidism is the most common endocrine disease in felines. Since the late 70's and early 80's when the earliest clinical reports were published, the diagnosis of hyperthyroidism in cats has increased dramatically. Most clinicians are very familiar with the presentation of the "typical" hyperthyroid cat. These clinical signs include polyphagia, weight loss, polyuria / polydipsia, gastrointestinal signs and a poor haircoat. However, because the awareness and testing for this disease has increased so has the identification of the "atypical" case. These signs include decreased appetite, depression and lethargy.

As the number of cats diagnosed with hyperthyroidism has increased, so have the various diagnostic tests used to identify them. Typically, the total T4 is used initially as a screening test for hyperthyroidism. High values associated with clinical signs are generally conclusive for this disease. If, however, the total T4 level is "high" normal, but there is clinical suspicion for the disease, then other tests may be necessary. These tests include free T4 by equilibrium dialysis, T3 suppression and thyroid scintigraphy.

Free T4 by equilibrium dialysis measures the unbound or "active" hormone. This value in conjunction with the total T4 may allow better evaluation of thyroid gland function. Recently, it was noted that some euthyroid patients were identified to have an increase in the free T4 hormone level. It is important to note that interpretation of the free T4 MUST be in conjunction with a total T4 value. A diagnosis of hyperthyroidism cannot be made on an increased free T4 hormone level alone.

The T3 suppression test is a provocative test, which evaluates the hypothalamic – pituitary – thyroid axis. Cats with hyperthyroidism have autonomous release of thyroid hormone, independent of this axis. If a cat is hyperthyroid, the administration of T3 will not suppress the thyroid secretion. However, a euthyroid animal will decrease total T4 levels when given exogenous T3 hormone. Thyroid scintigraphy, although generally not available, is a method in which the uptake of a radiopharmaceutical, Technetium 99, corresponds to thyroid gland activity.

Once the diagnosis of hyperthyroidism is made, there are three therapeutic options. The first option is medical management including methimazole (Tapazole) and iodinated compounds (Ipodate). Methimazole is a commonly used drug that prevents the synthesis of thyroid hormones. Advantages of this therapy include the option of short- or long-term therapy and availability. Disadvantages include gastrointestinal side effects, bone marrow alteration, behavioral changes, and daily administration. Ipodate is a cholecystographic agent that inhibits the peripheral conversion of T4 to the active form of T3. This therapy offers short-term control. It can be used when cats have a reaction to methimazole prior to a long-term solution (i.e., surgery or I-131).

The second option is surgical removal of the thyroid glands. The advantages include possible long-term improvement and availability. Disadvantages include possible surgical and anesthetic complications, invasiveness, iatrogenic hypoparathyroidism and hypothyroidism, and the possibility of a second surgery, since most cats will have bilateral disease.

The third and best option is radioactive I-131. The advantages include greater than 94% long-term success with one treatment, no anesthetic or surgical complications, non-invasiveness, requires no daily administration of medication, and is now readily available at Florida Veterinary Specialists.

What about the cost of these treatment options? Please refer to the cost summary on the following page; as you can see, long-term cost is very similar.

by Helga Bleyaert, V.M.D., Diplomate ACVS

ZURICH CEMENTLESS TOTAL HIP PROSTHESIS



Hip dysplasia is still a prominent problem despite its increased awareness in both the veterinary and public domains. It can be a crippling disease in young and old dogs. For some of these patients, we can offer preventative treatment in the form of a triple pelvic osteotomy (TPO) to minimize secondary degenerative joint disease. For many however, degenerative changes are present at the time of diagnosis, or subluxation is so severe that a TPO is not a consideration. For these patients, either a femoral head and neck ostectomy (FHO) or a total hip replacement must be considered.

While an FHO is a functional and relatively pain free resolution for most dogs, it is considered a salvage procedure. Large breed or overweight dogs can have residual lameness because the musculature must carry the full weight of the dog without skeletal support. Cemented total hip prosthesis has been used successfully in dogs for more than 20 years. While the functional outcome can be excellent, the procedure has limitations. It is technically demanding, requires lengthy surgery, has complication rates in the range of 18%, and revision of the prosthesis in instances of infection or implant loosening is extremely difficult and traumatic. In response to these difficulties, the University of Zurich has developed a cementless total hip prosthesis that has been in clinical use since 1993. The goal in the development of this system was to improve clinical results, offer a reproducible surgical technique and simplify revision surgery when it becomes necessary. In follow-up studies to date the system has met these goals with great success.

All metal components of the cementless total hip prosthesis system are titanium alloy and the acetabular cup insert is made of an ultra-high-molecular weight polyethylene to withstand wear and tear. It is a modular system that has numerous stem and cup sizes, and head and neck lengths to accommodate dogs of various sizes and conformations. Ideal candidates for this system generally range in weight from 60 to 120 pounds. While dogs of greater size and weight can be done, as with any total hip prosthesis system, the risks of complications increases. Smaller implants will soon allow dogs of smaller sizes to undergo the procedure.

There are numerous advantages of the Zurich prosthesis over the traditional cemented types. Because of the unique design, this system can be done in dogs as young as 6 months of age when necessary. This is because the system is compatible with the developmental growth of young dogs and accommodates bone remodeling. The stem anchors onto the femur similar to an interlocking nail with screws that allow bony remodeling without compromising strength or stability. Unlike cemented prostheses, the stem anchors onto one cortex only, avoiding coupling both cortices together. This reduces micromotion during normal movement of the femur that in turn prevents premature implant loosening, formation of debris and secondary bone resorption.

The convex surface of the cup contains numerous laser drilled holes. These allow for bony ingrowth to improve long term stability and allow fluid convection to avoid early loosening. Of great significance is a lower complication rate of about 6%, including a lower rate of postoperative luxations, fractures, and infections. This may be related in part to decreased surgery time necessary to place the implant when compared to cemented prostheses. When complications do arise which require additional surgery, greater than 99% of revisions are successful.

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Surgery Update
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The life expectancy for a cemented total hip prosthesis in humans is approximately 10 years. After this time, implant loosening is present in most patients. This is also true of cemented implants in dogs, but because dogs age more rapidly than people, implant loosening is evident in most within 5-7 years. While long term results must still be analyzed for the Zurich system, it is hoped that the improved structure and biomechanics will provide a prolonged life expectancy of the implants when compared to cemented prostheses.

Remarkably, despite the extensive surgical manipulation required, most dogs are using the leg very comfortably the day following surgery, generally requiring only a two night stay in the hospital. Most dogs are essentially normal by 3 to 6 weeks. Total rehabilitation time until unrestricted leash activity may resume is approximately 3 months.

Canine hip dysplasia is a multifactorial disease with a possible nutrition related etiology. Risks associated with developmental skeletal disease include large/giant breeds, free-choice feeding, feeding high energy foods, and excessive calcium intake from food, treats and supplements. In particular, excessive dietary intake of calcium and energy, together with rapid growth, appear to predispose puppies to hip dysplasia, so one goal in feeding programs for large breed puppies should be to achieve moderate energy restriction. Meal-limited feeding is the recommended feeding method for rapidly growing dogs. Vitamin/mineral supplements, especially those containing calcium, phosphorus, vitamin D, and vitamin A should not be routinely given to growing dogs eating commercial foods. Because of the steep growth curve these puppies experience, their food requirements can change dramatically in a short period of time. These puppies should be weighed, their body composition evaluated, and their daily feeding amount adjusted at least every 2 weeks.

There may be an opportunity to overcome some of risks associated with the expression of canine hip dysplasia by implementing a proactive approach to nutrition and optimal weight management, both during growth and development as well as throughout adulthood. Making clear dietary recommendations and regular weight assessment to prevent obesity assist both the pet owner and the pet in minimizing expression of developmental orthopedic disease. Optimal weight management will also improve the outcome and shorten rehabilitation time after surgical intervention.

The Surgeons at Florida Veterinary Specialists have been specially trained and certified to perform the Zurich total hip replacement procedure and have had great success in the patients that have undergone the surgery. If you would like to know more about the procedure or determine if your patient may be a candidate, please do not hesitate to call Dr. Bleyaert or Dr. Levy. As always, the FVS Surgery Service strives to provide referring veterinarians and their clients with a great range of services and high quality care. ■



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Ophthalmology Update

by Michele Stengard, D.V.M., Diplomate ACVO

CATARACT SURGERY AND INTRAOCULAR LENS IMPLANTATION



Major advances in surgical techniques and equipment technology over the past 20 years have allowed for treatment of cataracts to be state-of-the-art in veterinary medicine. Human cataract surgery utilizes the identical techniques as those used for our

canine patients. The result of these advances is a lower rate of complications and greater overall success rate regarding vision and health of the eye.

Anatomy of the lens

The crystalline lens is an avascular highly organized arrangement of protein fibers. In addition to being avascular, the lens lacks innervation. These protein fibers, or lens fibers, are arranged in a lamellar fashion and derive their energy from the aqueous in which the lens is bathed. The lens is comprised of three parts: the capsule, the cortex, and the nucleus. Numerous fine zonular ligaments originating from the pars plana of the ciliary body (resting posterior to the iris) attach to the peripheral zone (equator) of the capsule suspending the lens within the eye. The capsule is made up of lens epithelial cells with their apices oriented inward and the thick basement membrane outward. The lens continues to grow throughout life as lens fibers are created in the cortex, filling the space within the capsule. However, the capsule can only grow to a finite size and is limited in the ability to accommodate the higher volume of fibers. As a result, the oldest and most central portion of the lens (nucleus) is condensed and gradually becomes increasingly opaque (nuclear sclerosis) with time.

Function of the lens

The principle function of the lens is to refract, or bend, light rays as they pass through the eye in order to focus upon the retina. Light focused in front of the retina or behind the retina results in near-sighted (myopia) or far-sighted (hyperopia) vision, respectively. In aging dogs, as in humans, the lens becomes increasingly dense and less pliable. In humans this condition is called presbyopia and usually results in the need for reading glasses. In animals, it is referred to as nuclear or

lenticular sclerosis. Nuclear sclerosis generally begins between the age of 6 and 8 years in the dog. While it does not result in blindness, visual acuity may be mildly affected. Clients may notice their pet having a problem in very bright or very dim light conditions as well as acting far-sighted. On ophthalmic examination, the tapetal reflection is present and the fundus will be visualized through the dense lens. This is in contrast to examination of a cataractous lens that will obscure visualization of the fundus and block the tapetal reflection.

Definition of cataract

A cataract is any opacity within the lens which cataract can range in size from pinpoint to complete opacification of the entire lens. The effect of a cataract on vision depends on the size and location within the lens. The location of a cataract can help determine the likelihood of progression. For example, opacities noted within the cortex are much more likely to progress than those noted in the capsule or nucleus.

Causes of cataract

The most common causes of cataract in dogs are genetic and diabetes mellitus. Other causes include chronic inflammation (uveitis), trauma, congenital, retinal degeneration, nutritional deficiencies, radiation exposure, toxins, hypocalcemia, and aging.

Which animals are not considered candidates for cataract surgery?

Dogs with retinal disease including retinal degeneration (progressive retinal atrophy), chorioretinitis, retinal detachment, and SARDS (Sudden Acquired Retinal Degeneration Syndrome) will not benefit from cataract removal. Patients with glaucoma are generally considered poor candidates for surgery.

What pre-operative tests are performed to determine if a dog is a candidate for cataract surgery?

After a complete ophthalmic examination, an electroretinogram (ERG) and ocular ultrasound are performed to assess the retinal health. The ERG

specifically measures the function of the retina. The ocular ultrasound is used to detect retinal detachment or lens position/structural abnormalities not evident by ophthalmic examination. These tests do not require anesthesia and rarely is sedation even needed. Dogs over 6 years old and those with systemic disease (i.e. diabetes) are requested to have a CBC, chemistry profile and urinalysis which may be performed by the primary care veterinarian. If diabetic, a urine culture and sensitivity is strongly advised.

How are cataracts removed?

The dog is placed under general anesthesia and with the assistance of an operating microscope, the technique of phacoemulsification is performed. A small incision is made near the limbus in the cornea allowing the introduction of microsurgical instruments. After a circular section of the lens capsule is removed, the phacoemulsification tip is inserted into the lens. The needle tip vibrates at very high frequency, ultrasonically fragmenting the cortex and nucleus. These fragments are pulverized and simultaneously aspirated through a port in the needle. This is the same technique used in human cataract surgery. An intraocular lens is implanted within the remaining lens capsule bag and the incision is closed with a fine absorbable suture.

What is the benefit of placing an intraocular lens implant?

The goal of placing an intraocular lens implant (IOL) is to replace the focusing power of the eye after the defective cataractous lens is removed. The ability for a material to bend light rays is called the vergence power, measured in diopters. In the dog, the refractive or vergence power of the lens is approximately 40 diopters. This is in comparison to human eyes in which the lens contributes approximately 13-16 diopters of bending power. When the lens is removed, then eye becomes severely hypermetropic or far-sighted. Implantation of an artificial lens helps to bring the focusing power into balance allowing for improved vision post-operatively.

When will vision return after cataract surgery?

Vision is present immediately upon recovery from anesthesia and typically improves over the following 1-2 weeks post-operatively.

What does the post-operative care entail?

Most patients are discharged from the hospital the same day of surgery. Follow-up recheck examinations are scheduled for 1 day, 1 week, 3 weeks, and 2 months after surgery. After this initial period patients are seen every 3-6 months for the first year and then twice yearly thereafter. A major factor contributing to success post-operatively is the after-care and ability to administer medications as directed. Clients are carefully educated regarding medications and early detection of problems their pet may be experiencing.

When should a cataract be removed?

Dogs are at higher risk for post-operative complications when the cataract is advanced (hyper mature). Ideally, a cataract is removed when the opacity is dense enough to result in vision loss and is noted to be progressing (late immature to mature stage). If one eye is significantly more affected than the contralateral eye, it is not recommended waiting for the other eye to "ripen" in order to perform surgery in both eyes at the same time. The lens-induced uveitis (LIU) secondary to the advancing cataract greatly decreases the success rate when surgery is finally performed. If a cataract cannot be removed whether due to financial concerns or prohibited the patient's systemic condition, topical anti-inflammatory therapy is recommended to help prevent sequelae of LIU including glaucoma, retinal detachment and chronic pain.

What are the complications of cataract surgery?

With careful patient selection and good patient after-care, the success rate for cataract surgery is excellent. Better than 90% of patients regain good long-term vision post-operatively. Infrequent complications include glaucoma, retinal detachment, and infection. Dogs with pre-existing uveitis (common in Diabetics) may require longer-term post-operative management to control inflammation.

Conclusion

Cataract removal is a rewarding experience for the client and their pet as well as for our ophthalmology group at Florida Veterinary Specialists. The improvement in quality of life for both pets and clients is tremendous. Careful patient selection, early diagnosis of cataracts, and good client counseling makes cataract surgery successful for vision restoration in dogs. ■

Radiology Update

by Valerie Sadler, D.V.M., Diplomate ACVR

NASAL DISEASE - WHICH DIAGNOSTICS SHOULD YOU CHOOSE?



Dogs and cats with nasal discharge are frequently encountered in general practice and in specialty referral hospitals. There are many causes of nasal discharge, including viral disease, sinusitis, periodontal and dental disease, infection, foreign bodies and neoplasia. Any patient with chronic nasal discharge, or nasal discharge or sneezing that is not responsive to medical management should have more advanced diagnostic procedures performed to determine the cause.

In the past, extensive diagnostic procedures were rarely performed, and medical management alone for clinical signs of nasal disease was the mainstay of treatment. With advances in technology we have been able to use endoscopy to evaluate the rostral aspect of the nasal cavity in medium to large sized patients, and the caudal aspect of the nasal cavity in small, medium and large sized patients. It is difficult to examine all parts of the nasal passages and sinuses with endoscopy alone.

Radiographs have also been used to evaluate the patient with nasal disease. Typically many views are taken of the nasal cavity and sinuses. We often rely on subtle radiographic changes to determine the site of the disease and the resultant clinical signs.

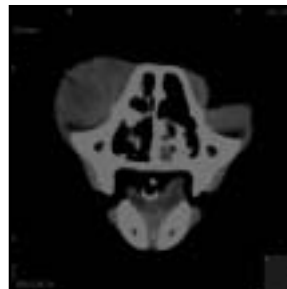
Together, endoscopy and radiographs provide a great deal of information about the patient with nasal disease, yet workup of these patients remains frustrating, as biopsies of what is believed to be the site of the problem, often does not result in a definitive diagnosis.

Computed tomography (CT) can provide an extensive non-invasive evaluation of the upper airway and sinuses – from the tip of the nose to the caudal recesses of the frontal sinuses. CT uses cross-sectional imaging, or thin slices, to more closely evaluate the nasal conchae, nasal septum, palate, frontal sinuses, the cribriform plate, and the surrounding soft tissues and bones.

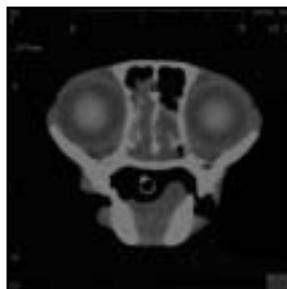
What appears as a subtle change on radiographs of the nasal cavity becomes readily apparent on CT. Direct comparison of one side of the nasal cavity to the other is possible on each slice. The computer allows us to focus on all of the soft tissues and the bones in the area. When contrast is administered, there is a differ-

ence in the degree of contrast enhancement of the normal soft tissues and the diseased tissue. On radiographs, we cannot tell the difference between nasal discharge and a soft tissue mass – they are the same opacity. CT allows us to differentiate between the two. We can determine the site of the nasal disease, the extent of invasion, the degree of destruction, and whether the disease has invaded into the brain. Using the contrast enhancement pattern, the best site for biopsy can be selected.

The images below were taken from CT examinations performed in the workup of nasal disease. The CT findings varied from mild to severe invasion and destruction, yet these patients presented with the same complaint – nasal discharge. Unfortunately, neoplasia was documented in each patient.



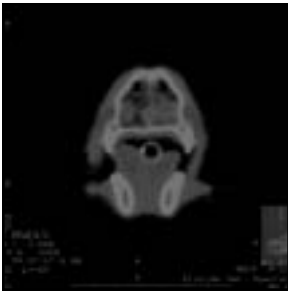
Kay, 3 yr DSH
Concha destruction is evident. There is an increase in soft tissue density in both sides of the nasal cavity.



Yughgo, 13 yr DSH
Concha destruction and increases in soft tissue density are noted in both sides of the nasal cavity. Destruction of the cribriform plate is also evident. Contrast administration documented invasion into the brain.



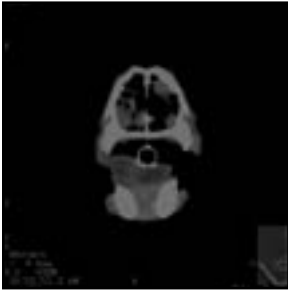
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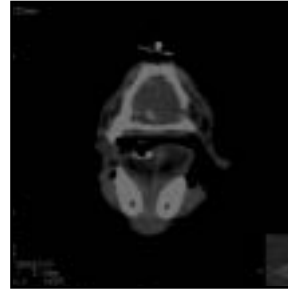
B, 18 yr Miniature Schnauzer
 There is a slight increase in density in the nasal cavity. The nasal septum and conchae appear normal.



Hershey, 13 yr Bearded Collie
 There is marked turbinate destruction and an increase in soft tissue density on both sides of the nasal cavity. Deviation of the nasal septum is also evident.




Charlie, 8 yr Italian Greyhound
 There is a slight increase in soft tissue density on both sides of the nasal cavity. Conchae destruction is evident.



Allie, 8 yr Dachshund
 Similar to Hershey, above, but there is also destruction of the nasal bone. The radiodense marker at the top of the image is used to help plan radiation therapy, if needed.

I know of no direct correlation between severity of nasal discharge and the severity of destruction and invasion documented with CT. As nasal disease can progress rapidly, I encourage aggressive workup of the patient with nasal discharge. Computed Tomography is a powerful diagnostic tool that can greatly aid in the workup of your patients with nasal discharge. Please do not hesitate to contact us for further information. ■




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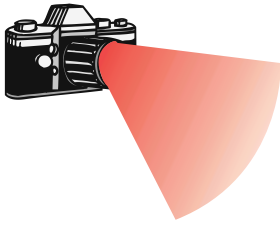


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Employee Spotlight



Bobbi Wolfgram, CVT
Oncology Head Technician



Bobbi Wolfgram is the FVS Oncology Department Head Technician. She performs all radiation treatments and helps administer chemotherapy treatments. Bobbie first graduated as a certified veterinary technician in 1995 from Madison, Wisconsin. She began her career working at veterinary practices, but the opportunity to join the FVS

oncology team, combined with Florida's warm climate, proved too irresistible. She joined the FVS team five years ago. Bobbi says her passion has always been with animals. "I had no idea that it would lead me to working with such a fantastic oncology team." When asked what she loves most about her job she replies, "I work with an excellent team, but the animals and clients I get to know along the way make every day worthwhile and so rewarding." Bobbi is currently taking courses to become certified as a radiation therapist.

Outside of work, Bobbi enjoys traveling, tennis and biking. At home she has 3 cats named Rosie, Louis and Peroni and 2 ferrets named Ginger and Gymie.

Her advice to someone new in the field is to "always keep your heart in it; the rewards will be fulfilling." Keep up the great work Bobbi. FVS is lucky to have you!



Amy Benedict, CVT
Avian/Exotic Head Technician

Amy Benedict loves Avian and Exotics. She always wanted to be a Certified Veterinary Technician and had a good example to follow. Her mother was a Certified Veterinary Technician and went on to open a practice with Dr. Teresa Lightfoot. When Dr. Lightfoot brought her Avian and Exotic specialty to FVS last year, Amy followed. Amy is a native Floridian and graduated from St. Petersburg College in 2001 with an A.S. degree as well as her veterinary technician certification. She loves learning about different types of animals and enjoys evaluating blood smears from different species. If asked her advice, she'll tell you, "You must dedicate 100% of yourself in order to give the highest standard of animal care." In addition to her FVS duties, she teaches the large animal lab at St. Petersburg College and lectured at the 2003 Florida Veterinary Technician Association meeting.

Outside of work, Amy enjoys riding her horse and traveling to rodeos. At home, she has 2 horses, Bears and Boone, 2 dogs, Dumpy and Dewey and 1 Pionus Parrot. Amy has truly raised the bar. Thank you Amy for all of your hard work! It is not only the clients and animals that benefit from your being with FVS; we all do! ■

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