

HEALTH NEWS #13

From THE WINN FELINE FOUNDATION

Summaries by Betty White 9/06

Veterinary Practice News, June 2006, "Prosthetics Offer New Hope." Author Sandy Robins offered an overview of prosthetic devices available for pets and discussed at length the surgery of a 2-year-old golden retriever suffering from osteomyelitis. A certified prosthetist orthotist was on hand for the dog's operation at the Matthew J. Ryan Veterinary Hospital at the University of Pennsylvania in Philadelphia. The medical team customized and fit a permanent artificial leg. While the use of this type of prosthetic device on animals is still fairly uncommon, it may not continue to be so. This is an example of how veterinary medicine has benefited from the experience of amputative surgeries on humans, as well as human technological innovations in prosthetics and implants. Veterinarians will need to be educated to leave more bone length, if possible, as the present practice is to amputate at the shoulder or the hip. Although the initial measuring and cast made in house by a certified prosthetic orthotist may be optimal for the best success, any veterinarian can take a cast and send it to an orthotic facility.

Another prosthetic technique is being developed at the North Carolina State University College of Veterinary Medicine in Raleigh, known as osseo-integrated implants. (*Note: A summary of the article discussing this procedure was published in "Health News" in the February/March 2006 CFA ALMANAC.*) In this instance, the operation was on a cat and involved inserting a thin steel shank into the femur and allowing bone to grow around it in the same way bones grow around a hip replacement socket. If consistently successful, this method could replace the devices that must be strapped into place.

Hip replacement surgery is now a commonplace option for dogs. The reason for this is that hip dysplasia is the leading genetic health problem in many dog breeds and the most common skeletal disorder seen by veterinarians. Prosthetic implants are one of the options in the medical management of this malady. Accordingly, the technique is included in basic surgery courses at veterinary schools around the country. Owners, as well as veterinarians, should be aware of all the choices available in managing this particular problem.

Veterinary Practice News, May 2006, "Can Animals with Diabetes 'Go All-Natural'?"

Narda Robinson, DVM, discusses the growing use of herbals and nutraceuticals by human diabetics and postulates that non-drug insulin alternatives may be of increasing interest to owners of diabetic animals. She emphasizes that no insulin alternatives deliver the benefits proven to be as effective or reliable as insulin. However, faced with the daunting prospect of twice-daily injections, owners are quite likely to investigate feasible alternatives. Clients need to discuss these alternatives with their veterinarians, because herbal mixtures could conceivably alter blood glucose levels and offset insulin requirements. Animals not closely monitored could develop uncontrolled hyperglycemia, or to the other extreme, dangerously low blood glucose levels.

Dr. Robinson points out the differences in metabolism between the human body and the feline or canine body. The differing content of botanical products, whether it is from fertilizer use or time of harvest, creates an additional problem. These products are not standardized or regulated for human use; they are of unknown efficacy for animals. Yet, if a well-loved pet with a debilitating, potentially fatal disease can be medicated in gentler fashion and thus have the quality of his life improved by alternate therapy, it is no wonder that this is an appealing prospect.

The answer, of course, is more research into herbal remedies and nutraceuticals, with specific reference to companion animals.

Veterinary Practice News, April 2006, "Study Shows Proposed Drug May Treat CRF."

A press release from Altair Nanotechnologies, Inc. of Reno, Nevada, reports on an initial study of the safety and efficacy of Renalan, its proposed drug and food additive for chronic renal failure. Failing kidneys no longer remove excess phosphate, which further accelerates the progress of the disease. Alan Gotcher, PhD, president and CEO of Altair, said, "Our latest study suggests that Renalan – a lanthanum-based crystalline nanomaterial – safely and effectively 'grabs' those phosphates and neutralizes them." Three groups of four cats each were studied for efficacy and palatability. No side effects were reported after 21 days, and all the cats had either gained or maintained their weight with no toxic effects. The cats showed a 134% increase in the presence of phosphates in the feces, indicating that the Renalan was successfully binding excess phosphorous and allowing it to be flushed from the body. The company is actively seeking partnerships with pet food companies and/or animal health suppliers for further study of Renalan and to market it as a food additive, nutrient, or drug therapy.

Veterinary Practice News, April 2006, "Insulin Issues in Fat Dogs and Diabetic Cats."

Anthony Carr, DVM, addresses obesity in both dogs and cats. He points out that it is a well-documented fact that obesity in both humans and cats results in insulin resistance. It is interesting to note that obese dogs appear to increase insulin secretion sufficiently in response to decreased insulin sensitivity to compensate for insulin resistance.

A new long-acting insulin compound, glargine insulin, is of great interest in treating feline diabetes. It differs from other insulins in that it is less soluble at normal body pH, resulting in slower absorption by the body. Researchers at Tufts University studied cats placed on identical diets, some receiving once-daily glargine insulin and others receiving twice-daily lente insulin. The study showed no difference in results, although suggesting a natural preference for the therapy required only once a day. A similar study by Australian researchers¹ produced data indicating the administration of glargine insulin is superior to both lente and protamine zinc (PZI) insulin. In this study, all of the cats treated with glargine went into diabetic remission for at least two weeks after cessation of insulin therapy, and within four months of beginning the treatment.

Differences in these two studies may explain the disparity in results. The Australian study used glargine twice daily, which might result in tighter glycemic control. This study also included only newly diagnosed cats, while the Tufts study also included cats that were poorly responsive to other insulins.

Prior research has shown that standard insulin therapy coupled with a low carbohydrate/high protein diet can result in diabetic remission in cats with newly diagnosed diabetes. The reason may be that cats tend to have Type 2 diabetes that can often be resolved by diet and weight reduction. Glargine insulin continues to be of great interest to veterinarians and cat owners. However, more studies of cats treated with the compound are needed. Additional research may indicate that glargine is the therapy of choice for newly-diagnosed cases of feline diabetes.

Veterinary Practice News, April 2006, "CT Can Help Avoid Useless Surgery." When is surgery to excise a malignant mass a realistic option? Kevin A. Hahn, DVM, PhD, discusses diagnostic imaging and how the various types differ in their ability to answer this question. Survey radiography is readily available, inexpensive, and non-invasive. However, its ability to distinguish between normal and neoplastic soft tissue is poor. Structures of the same physical density lying in contact with one another cannot be seen as separate entities. Ultrasound, on the other hand, provides information on soft tissue structure and tumor size; it does not, however, define spatial resolution as well as survey radiography. The definition of the far margins is poor in both these imaging modalities. Further, an important consideration with ultrasound is that much of the information on tissue orientation depends upon the skill of the ultrasonographer.

Imaging with X-ray computed tomography (CT) provides excellent contrast discrimination among various tissue types. Tumor physical density can be compared with that of normal tissues to provide further information on the size of the mass and/or degree of invasiveness. This allows a more precise determination as to whether a tumor can be excised with clean margins. If it cannot, both patient and owner can be spared an unnecessary procedure. For all these reasons, CT answers the question of realistic expectations for surgery when a mass on the body wall, face, or an appendage is in question.

Veterinary Practice News, March 2006, "Drawing a Bead on Cancer Cells." Kevin A. Hahn, DVM, PhD, reports on new successful research by biomedical engineers at Rice University in Houston investigating the use of nanoshells in cancer therapy. The nanoshells, gold-coated quartz spheres roughly 1/500th the width of a human hair, are able to capture light and convert it to heat. Coated with a substance that binds them to cancer cells, the nanoshells are activated by infrared light shone through the skin by a very simple handheld laser. It takes only three minutes for the nanoshells to convert light to heat and kill malignant cells. Targeted directly to the tumor, the nanoshells have destroyed tumors in mice while not harming the surrounding, healthy tissue. Tissue cells absorb far less energy than the nanoshells, a process akin to that of a microwave as food is heated while the container remains cool.

This new approach to cancer therapy is in stark contrast to chemotherapy, which circulates through the body and kills everything in its path. This "toxic trail" is absent with the use of nanoshells. A clinical evaluation of this new therapy is now underway with cats, and so far no adverse reaction has been noted. Nanoshells are essentially stealth

particles, coated with specific molecules that make them unrecognizable to the body as a foreign object. Gold, used in the process, has that particular attribute.

Should the cat studies continue to prove effective, human trials could begin within another year to 18 months.

Veterinary Practice News, March 2006, “Benefits and Cautions for Supplements and the Eye.” Ophthalmologists are taking note of the effects of herbs and nutraceuticals on the eyes, and Narda Robinson, DVM, shares some of their concerns. One of the natural products that offers a clear benefit is l-lysine. Daily oral administration of 400 mg of l-lysine reduces viral shedding from the eye following re-housing in cats latently infected with feline herpesvirus type-1 (FHV-1). However, the effectiveness of high levels of l-lysine for the control of FHV-1 is dependent upon low levels of l-arginine. Since cats are sensitive to l-arginine deficiency, it remains to be determined if l-lysine is as effective used alone.

L-lysine may be contraindicated in the presence of renal and/or hepatic disease, as patients may have difficulty eliminating the large amounts of nitrogen generated by l-lysine metabolism. Potential drug interactions may occur when calcium is also administered. In addition, there may be enhanced toxicity of aminoglycoside medication if it is given along with large amounts of l-lysine.

While only evaluated in humans, long-term antioxidant supplementation may protect the lens and may improve marginal dry-eye conditions in animals. Lutein and zeaxanthin occur in the lens and retina. These neutral to yellow pigments absorb blue light entering the eye that can lead to light-associated damage of the lens and retina. Lutein also removes photo-induced reactive oxygen species. Lens proteins aggregate when subjected to oxidation, one of the mechanisms for the development of cataracts. Dietary sources of lutein and zeaxanthin include – in descending order of content – kale, spinach, romaine lettuce, broccoli, summer squash, peas, Brussels sprouts, and corn. The content in egg yolk is low, but it yields a highly bio-available source. Lutein, available in purified crystalline form as a supplement, is considered to be safe. Lycopene may also protect against cataracts, and is responsible for the red color in various fruits and vegetables. The primary dietary sources of lycopene are tomatoes and tomato products; it is also available as a supplement.

Ultraviolet radiation–induced cataracts may also be prevented by the anti-oxidant vitamins C and E. Studies indicate that animals treated with these supplements suffered less opacity of the lens as a result of ultraviolet B exposure compared to those animals untreated. There is some evidence that certain vitamins and minerals may benefit humans with age-related macular degeneration, although a 2006 review published in the American Journal of Ophthalmology found little other convincing evidence to support alternate herbal or nutritional regimes for eye conditions.

Veterinary Practice News, March 2006, “An Education in Feline Dentistry.” D. H. DeForge, VMD, emphasizes the importance of a complete oral examination in assessing the wellness of any feline. He lists two publications as excellent sources to study feline periodontal pathology, feline resorptive lesions, feline oral radiology diagnostics, feline

oral oncology, and feline oral inflammatory pathology. They are *Veterinary Dentistry Principles and Practice*, Wiggs/Lobprise Editors; Lippincott-Raven; 1987, and *An Atlas of Veterinary Dental Radiology*, DeForge/Colmery, Editors; Iowa State University Press/Blackwell Publishing; 2000.

Dr. DeForge offers a quick study of terms. Feline gingivitis: An inflammation of the tissues that overlie the bony alveolar processes of the maxilla and mandible and surround the tooth is termed gingivitis. Both gingivitis stage one and two are reversible with professional care and daily periodontal maintenance at home. Feline periodontitis: This disease is an inflammation of the tooth-supporting apparatus, and leads to progressively destructive changes and loss of bone. Periodontitis is irreversible, but it can be controlled with professional care and dedicated periodontal maintenance at home. Attachment loss: The destruction of the periodontal soft tissue and bony tissue is the main feature of active-phase periodontitis. This must be measured and evaluated. Feline resorptive lesions: These lesions are found where tooth enamel approaches pulp tissue and require tooth extraction. This can be difficult and often requires an oral care specialist when extraction technique is uncertain. Feline oral inflammatory disease (stomatitis): This is a chronic, non-responsive, generalized, and painful oral inflammation involving the free gingival margins, mucosa, palate, tongue, sublingual area, glossopharyngeal arches, commissures, and pharynx. It is the most misunderstood oral pathology of general veterinary practice.

Dr. DeForge states that adult cats with feline oral inflammatory disease are surgical patients. He indicates that these cats respond excellently with complete remission to a new protocol derived from a careful monitoring of the tissue changes of the disease, oral X-ray diagnostics, bone surgery, and grafting.

¹ Marshall, R.D., Rand, J.S. Treatment with glargine results in higher remission rates than lente or protamine zinc insulins in newly diagnosed diabetic cats. *JVIM* 19;425:2005.