



Feline Health Topics

for veterinarians

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Preliminary Report on the Use of Carboplatin in Cats

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Platinum analog compounds are widely utilized in veterinary medicine to significantly prolong disease-free intervals in dogs with many different types of non-hematopoietic malignancies. Use of the most commonly available platinum drug, cisplatin, is contraindicated in the feline patient due to an often fatal, irreversible, pulmonary edema.

Carboplatin is a second generation platinum compound that has shown a similar spectrum of activity against tumors in dogs and people. Carboplatin has been suggested as a possible chemotherapeutic drug for use in non-hematopoietic malignancies in cats. With its markedly reduced toxicity in dogs and people, it is conceivable that the drug may be less toxic to cats than other platinum compounds.

Carboplatin has been administered to 14 cats at the Tufts University Foster Small Animal Hospital.

Inside this issue ...

| | |
|-----------------------------------------------------------------|---------------|
| Preliminary Report on the Use of Carboplatin in Cats | page 1 |
| Research Briefs | page 2 |
| Recommendations for FeLV Testing | page 4 |
| Feline Practitioners Seminar | page 5 |
| For Your Practice | page 7 |

Twenty doses at a dose rate of 150 mg/m² have been administered to these cats with no observable adverse side effects. Blood samples were drawn at seven days post-administration (approximately 21 days following initial dosage) for complete blood counts, and owners monitored the cats for any signs of toxicity such as depression, vomiting, diarrhea, or anorexia.

Two other cats have experienced moderate myelosuppression 21 days following a second dose at 160 mg/m². One of these cats has continued to receive carboplatin at 150 mg/m² to a cumulative dosage of 2120 mg/m² with no other signs of toxicity.

Initial responses to carboplatin have been promising. There have been two complete responders, three partial responses, and two cats with stable disease. The most prolonged response has been in a cat with a nasal adenocarcinoma that was non-responsive to radiation and other conventional chemotherapy. Another cat that was receiving carboplatin in conjunction with radiation therapy for a sublingual squamous cell carcinoma was in complete remission when he died from complications associated with a gastrotomy tube. Partial response has also been seen in cats with maxillary osteosarcoma, mandibular squamous cell carcinoma and nasal adenocarcinoma. The two cats with stable disease after two doses of carboplatin had a maxillary adenocarcinoma and an oropharyngeal squamous cell carcinoma that was simultaneously being treated with radiation therapy.

(continued on page 8)



Research Briefs

Effect of Treatment of Hyperthyroidism on Renal Function in Cats

(Authors: S.P. DiBartola, M.R. Broome, B.S. Stein, M. Nixon)—The study was to determine whether increases in BUN and serum creatinine (SCr) concentrations, which have been reported to develop after surgical bilateral thyroidectomy in hyperthyroid cats, also develop after treatment of hyperthyroidism with radioactive iodine and methimazole.

Fifty-eight cats with hyperthyroidism were identified in six private practices in the United States and Canada. The cats were randomly assigned to treatment groups and were treated with the method (i.e., radioactive iodine or methimazole) routinely used by the practice handling the cats. Laboratory data obtained included SCr, BUN, and T_4 concentrations before treatment and 30 and 90 days after treatment

of hyperthyroidism with radioactive iodine, methimazole, or surgical bilateral thyroidectomy. Results showed that the mean SCr and BUN concentrations determined at 30 and 90 days post-treatment were significantly higher than those measured before treatment. The mean SCr, BUN, and T_4 concentrations were not different among the groups before treatment or 30 and 90 days after treatment. Mean SCr and BUN concentrations determined 30 and 90 days after treatment were significantly higher than those measured before treatment.

The reduction of serum T_4 concentrations after treatment of hyperthyroidism may result in azotemia in older cats with chronic renal disease. Treating azotemic hyperthyroid cats with methimazole until it can be determined whether correction of the hyperthyroid state will exacerbate the azotemia may be prudent. (Resource: *J Am Vet Med Assoc* 208:875-878, 1996)

Feline Health Topics

A publication for veterinary professionals

The ultimate purpose of the Cornell Feline Health Center is to improve the health of cats everywhere, by developing methods to prevent or cure feline diseases, and by providing continuing education to veterinarians and cat owners. All contributions are tax-deductible.

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Bordetella bronchiseptica Infections in Cats

(Author: R.D. Welsh)—Eleven cats from ten different households or catteries were diagnosed with *Bordetella bronchiseptica* infections. Seven cases proved fatal, in which *B. bronchiseptica* pneumonia was a primary or significant cause of death. The majority of cases (seven of 11) were in kittens less than eight weeks old. A universal complaint was coughing. Bacterial cultures from transtracheal washes or lung tissue were successful in diagnosing bordetellosis in all cases. This report indicates that *B. bronchiseptica* should be a consideration in a cat presenting with a primary complaint of coughing and may be a relatively common disease in catteries or shelter environments. (Resource: *J Am Anim Hosp Assoc* 32:153-158, 1996)

Other Research Articles of Interest

Biller DS, DiBartola SP, Eaton KA, et al: Inheritance of polycystic kidney disease in Persian cats. *J Hered* 87:1-5, 1996

Corcoran BM, Foster DJ, Fuentes VL: Feline asthma syndrome: A retrospective study of the clinical presentation in 29 cats. *J Small Anim Pract* 36:481-488, 1995.

Coutts AJ, Dawson S, Binns S, Hart CA, et al: Studies on natural transmission of *Bordetella bronchiseptica* in cats. *Vet Microbiol* 48:19-27, 1996.

DeBoer DJ, Moricello KA, Cairns R: Clinical update on feline dermatophytosis. *Compend Contin Educ Pract Vet* 17:1471-1474, 1995.

Doddy FD, Blickman LT, Glickman NW, Janovitz EB: Feline fibrosarcomas at vaccination sites and non-vaccination sites. *J Comp Pathol* 114:165-174, 1996.

Duesberg CA, Nelson RW, Feldman EC, Vaden SL, et al: Adrenalectomy for treatment of hyperadrenocorticism in cats: 10 cases. *J Am Vet Med Assoc* 207:1066-1070, 1995.

Jackson ML, Haines DM, Taylor SM, Misra V: Feline leukemia detection by ELISA and PCR in peripheral blood from 68 cats with high, moderate, or low suspicion of having FeLV-related disease. *J Vet Diagn Invest* 8:25-30, 1996.

Lester S, Clemett T, Burt A: Vaccine site-associated sarcomas in cats: Clinical experience and a laboratory review (1982-1993). *J Am Anim Hosp Assoc* 32:91-95, 1996.

Lubkin SR, Romatowski J, Zhu M, Kulesa PM, et al: Evaluation of feline leukemia virus control measures. *J Theor Biol* 178:53-60, 1996.

O'Brien RT, Evans SM, Wortman JA, Hendrick MJ: Radiographic findings in cats with intranasal neoplasia or chronic rhinitis: 29 cases (1982-1988). *J Am Vet Med Assoc* 208:385-389, 1996.

Scherk-Nixon M: A Study of the use of a transdermal fentanyl patch in cats. *J Am Anim Hosp Assoc* 32:19-24, 1996.

Thumchai R, Lulich J, Osborne CA, King VL, et al: Epizootiologic evaluation of urolithiasis in cats: 3,498 cases (1982-1992). *J Am Vet Med Assoc* 208:547-551, 1996. ■

Photocopies of the above articles are available by making your request via mail to the Flower-Sprecher Library, College of Veterinary Medicine, Ithaca, NY 14853; or by telephone at (607) 253-3510; or by fax at (607) 253-3080.

There is a charge for this service. The total charged is based on the number of pages copied, New York state sales tax of 8% if applicable, and delivery method (e.g., U.S. mail, Federal Express or fax).

The following guidelines for feline leukemia virus testing were developed by the American Association of Feline Practitioners and the Academy of Feline Medicine, and have been reprinted with their permission. The next issue of "Feline Health Topics" will feature guidelines for FIV testing.

***Please Note:** These Recommendations are based on sound principles, research, experience and technical judgments as of the time of preparation. While the information is intended to be accurate, thorough and comprehensive, it is subject to change in light of developments in research, technology and experience. The Recommendations are not exclusive, and other techniques and procedures may also be available. AAFP and AFM expressly disclaim any warranties or guarantees, express or implied, and shall not be liable for damages of any kind in connection with the material, information, techniques, or procedures set forth in the Recommendations.*

The Feline Leukemia Virus (FeLV) status of all cats should be known. FeLV infection is global in occurrence with prevalence rates varying by location.¹ FeLV is transmitted contagiously among cats and is associated with the illness and death of more cats than any other pathologic condition.² Testing and identifying positive cats is the mainstay of managing FeLV infection; this is not supplanted by vaccination. The best means of preventing disease is by preventing exposure to FeLV-infected cats.¹

Testing for FeLV should be done if the household meets any of the following criteria:

- a. New kittens or cats before introduction into a household to prevent exposing existing cats.

Recommendations for Feline

- b. Newly adopted kittens or cats, even if they are the only cat in the household, for the following reasons:
 - 1.) The strong emotional bond that forms between pet owners and pet justifies knowing the FeLV status because of future ramifications.
 - 2.) Statistically, most cats do not remain the only cat in a household, so future exposure is very likely to occur.
 - 3.) Indoor cats may escape and expose other cats.
- c. Cats in existing households where the FeLV status is not known because carrier cats can remain asymptomatic for years and expose all other cats in the household.
- d. Cats in which a recent exposure (known or potential) occurs, regardless of previous negative test results, because the FeLV status can change.
- e. Ill cats because FeLV has been associated with a great variety of illnesses in cats.
- f. Cats presented for FeLV vaccination should have a known FeLV status prior to vaccination because vaccination does not affect the carrier state or the development of disease in cats with existing infection; existing carriers remain an exposure risk to other cats; and an existing carrier can subsequently become ill and appear to be a "vaccine failure."

Tests and Interpreting Results

The principle of FeLV testing is the detection of p27

Leukemia Virus Testing

core antigen or other antigens of the virion. The ELISA detects p27 in whole blood, serum, plasma, tears or saliva, whereas the IFA detects antigen within leukocytes and platelets.⁴ The ELISA test is recognized as the preferred screening test for FeLV.¹

The IFA test is more appropriate as a confirmatory test for FeLV.¹ The ELISA kit tests are accurate and allow for rapid in-clinic testing.²

Kittens can be tested at any age; maternal immunity in young kittens does not interfere with FeLV diagnostic tests.¹ Vaccination with FeLV vaccines does not interfere with FeLV diagnostic testing. The diagnostic tests assay for viral antigens; so, immune response to the vaccine is not detected.¹

After screening by use of an ELISA test, a positive or equivocal result should be repeated.¹ The FeLV ELISA systems are most reliable when serum or plasma is tested.¹ ELISA tests using saliva or tears have a disproportionate number of both false positive and false negative results.¹ Therefore, these tests cannot be recommended for routine screening of individual cats. If an ELISA test is positive using whole blood, saliva or tears, the test should be repeated using a serum or plasma sample. One should always run a validated IFA test to confirm results on a healthy positive cat before considering it persistently viremic.¹

No test is 100% accurate at all times and under all conditions; therefore, a critical decision about the care of a patient, whether healthy or ill, should never be based solely on a single test result.³

All kittens or adult cats which test negative by the first ELISA screening test, but with a known or suspected exposure to FeLV, should be retested. This

is done to rule out possible negative results obtained during incubation of FeLV. Although the majority of cats will test positive within several weeks, final retest of negative cats should be no sooner than 90 days post-exposure. Clients should be counseled on the potential risk of FeLV exposure when adding a cat with one negative test result to an FeLV-negative household.

Discordant results are defined as conflicting test results, usually being an ELISA-positive and IFA-negative result.¹ Discordancy can occur due to testing in the early phase of infection; antigenemia without viremia (no intact virus); or a false-positive ELISA due to faulty technique or cross-reactive antigens. These cats should be monitored by both ELISA and IFA assays at 4-8 week intervals for at least 90 days.²

Other confirmatory tests, such as polymerase chain reaction (PCR) methods, may be useful but are currently unvalidated. Although PCR offers a promising approach to FeLV testing, currently neither production of PCR reagents (primers) nor testing protocols is standardized or consistent.

Latent infections with FeLV are undetectable with ELISA or IFA testing. PCR testing can offer a new means of detecting these cases.⁵ Shedding of FeLV or development of FeLV-related diseases can be a consequence in latently infected cats, but is felt to be a rare clinical occurrence.²

Testing At-Risk Cats

Annual testing of cats "at risk" is justifiable. Cats "at risk" are defined as those with known or potential exposure to FeLV. Outdoor cats; fighting cats; strays; cats with bite wounds; escapees; recently mated females if the FeLV status of the male is unknown;

(continued on next page)

cats in open multiple-cat households; cats in closed multiple-cat households with any other cats of unknown FeLV status; and cats in households having a known FeLV positive cat are considered at risk.

All FeLV-negative exposed cats in a multiple-cat household (in which an FeLV carrier is found) should be retested at 3 month intervals until all cats within the household or facility test FeLV negative on at least two consecutive tests and the risk of exposure to FeLV infection is past. All FeLV-positive cats should be immediately isolated or removed at the time of diagnosis.^{1,4}

FeLV Management

FeLV-positive healthy cats may live for months to years. The question of euthanizing a positive cat is one that must be addressed in each individual case, in consultation between veterinarian and client. Effective FeLV case management involves measures aimed at preserving the health of the infected cat; preventing the spread of FeLV infection; and early recognition and aggressive treatment of FeLV-associated disease. The quality of life and clinical status of

FeLV-positive cats can be enhanced through the concerted efforts of the pet owner and the attending veterinarian. ■

^a All recommendations regarding IFA testing are based on studies done by a validated IFA test run by National Veterinary Laboratories.

References

- ¹ Colloquium on FeLV/FIV: Tests and Vaccination, J Am Vet Med Assoc, 199(10):1275-1276, 1991.
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- ³ Barr, MC: Feline Immunodeficiency Virus Tests and their Interpretation. Feline Health Topics for veterinarians, 8(3):1-5, 1993.
- ⁴ Rojko, JL, Hardy WD. Jr.: Feline Leukemia Virus and Other Retroviruses. In: The Cat: Diseases and Clinical Management, (Ed.) Robert Sherding, Churchill Livingstone, New York, Second Edition, 1994, pp.361-375.
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Feline Practitioners Seminar

The eighth annual Feline Practitioners Seminar will be held July 26-29, 1996 at the Sheraton Inn in Ithaca, New York. The meeting is sponsored in cooperation with Cornell University's College of Veterinary Medicine, feline Health Center, the American Association of Feline Practitioners, the feline Biologics Task force and several corporate sponsors.

The first two days will be devoted to advancing practitioners' knowledge of vaccines and how the cat responds both positively and negatively to their administration, including information on vaccine-induced adverse reactions leading to the development of sarcomas and fibrosarcomas. The remaining two days of the conference will highlight other clinically relevant presentations on clinical pathology, blood types and transfusions, hematologic genetic disease,

genetic testing, proper antibiotic selection, nutrition and managing chronic vomiting.

Tours of the newly completed veterinary teaching hospital and facilities will be provided for those interested. As usual, lively discussion during breaks with the experts, international colleagues, and the interactive general sessions will provide another dimension in learning. The annual Sunday picnic, complete with blue grass music and scenery will provide for a relaxing fun-filled evening.

The cost for the seminar is \$325. For further information or to register, contact Linda Alfreds, Office of Continuing Education, College of Veterinary Medicine, Cornell University, Ithaca, NY 14853; phone (607)253-3200; or fax (607) 253-3198. ■

For You and Your Practice

The Cornell Book of Cats

The Cornell Feline Health Center offers a quantity discount for book orders placed by veterinary offices. The book retails for \$27.50, but when you order 10 or more books the cost is only \$21.50 per book plus shipping and handling (\$6/10 books). Books are shipped by UPS. (Allow 4 to 6 weeks for delivery.)

Client Information Brochures

You'll find these brochures a welcome addition to the client resources you use. Topics include: *Feline Immunodeficiency Virus, Feline Infectious Peritonitis, Feline Leukemia, Toxoplasmosis, Diabetes, Inflammatory bowel Disease, Feline Behavior Problems, Feeding Your Cat, Special Needs of the Older Cat, Urinary Obstruction, Choosing and Care of Your New Cat, and Gastrointestinal Parasites.* You can preview a sample of all 12 brochures by ordering our sampler for only \$3. Or you can order quantities for your office by requesting order blanks on the form below.

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The Cornell Feline Health Center's Memorial Program is a positive way to help your clients cope with

the loss of their feline friends. Order a supply of memorial cards by completing the form below.

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If you have a difficult feline case or want current information on feline diseases, call 1-800-KITTY DR and talk with our consulting veterinarian. The service is available from 9 a.m. to noon or 2 p.m. to 4 p.m. (Eastern time) on weekdays (excluding holidays). A \$25.00 fee for the consultation helps the center defray the cost of this valuable service. (*Members receive a 20% discount.*)

Tee-shirts

These shirts are 100% preshrunk cotton and feature the Center's logo and two cats. Available colors: Stonewashed Blue, Teal Green, Fuchsia, Ash, Purple, and Turquoise. Adult sizes only: Large (42-44), X-Large (46-48), XX-Large (50-52). Cost per shirt is \$14.99 (plus \$2 shipping, and 8% sales tax for NY residents).

Order Form

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| Information Brochure Order Blank | | 0 | 0 |
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Preliminary Report on the Use of Carboplatin

(continued from page 1)

Continued dose escalations are needed to ensure that adequate dose intensity is achieved while minimizing toxic side effects. It is unlikely that we have reached the maximal dosage since we have not seen evidence of significant myelosuppression in the majority of our patients. Our preliminary work suggests that carboplatin is an effective and well-tolerated chemotherapeutic drug in the cat. Careful monitoring of complete blood counts at days 7, 14, and 21 post-administration is recommended. It appears that neutrophil nadir may be at day 21, necessitating verification of an adequate white blood cell count prior to further drug administration. Phase I clinical trials along with pharmacokinetic evaluation are needed to determine an efficacious dose of carboplatin in the feline patient. ■

This report has been reprinted with permission from the "Veterinary Cancer Society Newsletter," Volume 19, Number 1:9, 1995. Dr. Wood received her D.V.M. degree from Kansas State University.

Feline Health Center is on the Internet

When surfing the Net, stop and visit the Cornell Feline Health Center's Home Page. The address is:

<http://web.vet.cornell.edu/public/fhc/FelineHealth.html>

Some of the pages are still under construction, so not all features are available yet, but will be in the near future.



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