



# Feline Health Topics

for veterinarians

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## *Helicobacter* and Chronic Gastric Disease

Thomas Schermerhorn, V.M.D.

For nearly a decade, proponents of the acid theory of ulcer formation fended off accumulating evidence that gastric infection with a spiral-shaped bacterium was central to the pathophysiology of ulcer disease. Ultimately, the accrued data was convincing and powerful enough to cause even the staunchest defenders of the acid theory to surrender their position. In the world of gastroenterology, toppling the "No acid, No ulcer" dogma was so tumultuous that one reviewer suggested it was akin to the fall of communism in the U.S.S.R.<sup>10</sup> The usurper, of course, is the bacterium, *Helicobacter pylori* (formerly *Campylobacter pylori*). Recognition and treatment of this infection have greatly simplified the management of chronic ulcer disease in humans.

Spiral bacteria have been known to inhabit the stomachs of normal animals since the late 1800s.

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**Special Insert—Memorial Program**

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With the suggestion in the early 1980s that *H. pylori* was a pathogen, other bacteria living commensally in the stomach were quickly rounded up and brought to trial. The result was that other spiral-shaped bacteria were identified which could cause gastritis under certain conditions, although none seem to be as important as *H. pylori* as an agent of disease. There have been scattered reports in the veterinary literature documenting gastric spirilla in dogs and cats.<sup>2,4,7</sup> It has been recently suggested that cats may act as reservoirs for human infection with gastric spirillum.<sup>3,5</sup>

Chronic ulcer disease is uncommon in domestic animals. Gastritis is commonly diagnosed on clinical grounds, but because many cases have transient signs and a self-limiting course, symptomatic therapy is often provided in lieu of a definitive diagnosis. Chronic vomiting in cats is often ascribed to ingestion of hair. Dietary indiscretion is often cited as causing recurrent episodes of gastritis in dogs. In both cases, these etiologies can cause the observed clinical signs, but alternate etiologies are often not considered. In humans, *H. pylori* has been associated with chronic gastritis and ulcer disease. Information concerning the role of infection with *Helicobacter* spp. as a cause of chronic gastritis in domestic animals is scant. This article summarizes recently published information regarding gastric infection with spiral bacteria in humans and companion animals.

### Brief review of *H. Pylori* in humans

The causative relationship between infection with *H. pylori* and gastric disease is well established.<sup>11</sup> Appropriate antimicrobial therapy results in eradication

of the organism from the stomach and healing of gastric and duodenal ulcers.<sup>12</sup> The exact pathogenic mechanisms by which *H. pylori* causes disease are not fully known but bacterial and host factors are thought to be important.

In addition to peptic ulcer disease, chronic infection with *H. pylori* has been shown to result in the development of atrophic gastritis. Atrophic gastritis is a risk factor for the development of certain types of gastric carcinoma. There is epidemiologic evidence that shows a statistical association between infection with *H. pylori* and gastric carcinoma.<sup>8</sup> A similar relation exists for *H. pylori* and gastric lymphoma.<sup>9</sup> Surprisingly, the available evidence does not support a relation between *H. pylori*-induced chronic ulcer disease and gastric cancers.

## Gastric spiral bacteria in cats

*Helicobacter* spp. are gram negative, spiral-shaped bacteria. Molecular methods allow definitive identification of the *Helicobacter* spp. These organisms are occasionally detected in the duodenum, but most infections are exclusively confined to the stomach. The region of the stomach that is infected varies with the species. For example, *H. pylori* often causes

antral gastritis, which is a predisposing factor for duodenal ulceration. Microscopic studies have demonstrated that the organisms may colonize many sites in the gastric mucosa. They may be found extracellularly in the mucous layer, interepithelial space, near the intercellular junctions of the gastric epithelium, within the gastric glands or lining the surface of the gastric pits. Organisms have also been observed in an intracellular location in epithelial cells and inside the caniculi of the parietal cells. Some species of *Helicobacter* have not been successfully cultured by traditional microbiologic methods.

Three species of spiral bacteria have been isolated from cats—*H. felis* and *H. pylori* and *Gastrospirillum hominis*. The latter species has recently been shown to belong to the *Helicobacter* genus (bringing the total to nine members). *Gastrospirillum hominis* has been tentatively renamed *Helicobacter heilmannii*, but will be referred to by its former name in this discussion to avoid confusion with existing literature. *G. hominis* and *H. felis* are also found in dogs. Another *Helicobacter*, *H. mustelae*, is found in ferrets.

## Do *Helicobacter* spp.<sup>a</sup> cause disease in cats?

This is a difficult question to answer since research has been minimal in this area. One veterinary study looked for spiral bacteria in gastric biopsies obtained from pet cats with clinical signs of gastritis.<sup>2</sup> Clinically normal, colony-raised cats were used as controls. *G. hominis* was found in 57% of ill cats and in 42% of the control cats. Also, 35% of the control cats had histologic evidence of gastritis despite being clinically healthy. In another study, *Helicobacter* spp. and *Gastrospirillum* spp. isolated from cheetahs induced a mild lymphofollicular gastritis in kittens. The gastritis did not progress during the 11 month study.<sup>1</sup> Similar histologic findings were described in a group of *H. pylori* infected cats in another study.<sup>3</sup> Unlike the cats in the previously described study, a plasma cell component to the inflammatory infiltrate was noted in these cats. A neutrophilic infiltrate, which characterizes *H. pylori* infections in humans, was not found in either study. It is not clear whether

## Feline Health Topics

*A publication for veterinary professionals*

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the cats in either study showed clinical signs of gastritis.

### Are *Helicobacter spp.* zoonotic organisms?

The mode of transmission for *Helicobacter spp.* has not been elucidated. It has been suspected that the organism is spread by the fecal-oral route, but this suggestion is based on its epidemiologic profile instead of direct experimental evidence. Investigations into the mode of transmission have yielded conflicting results.<sup>6</sup> Gnotobiotic beagles infected with *H. pylori* and *H. felis* transmitted both organisms to uninfected cagemates. In contrast, germfree mice and rats infected with *H. felis* did not transmit the organism to cagemates or to offspring. The organisms are consistently found in the vomitus, gastric secretions, stomach and occasionally the duodenum of infected individuals, but are absent from the remainder of the gastrointestinal tract.

Attempts to culture organisms from the stool or samples obtained from the animal's cage, bedding, etc. have been unsuccessful. Species differences in the ability of infected individuals to pass the organism to cagemates may be due to differences in the degree of oral contact. Rats and mice do not vomit and are coprophagous, while normal dogs may vomit intermittently and are not coprophagous. An uninfected dog is likely to contact gastric secretions of an infected dog, while it is unlikely that a rodent will encounter infective fluid from an infected cagemate. Interspecies transmission has also been shown to be possible. Gastric contents from an infected cat were used to transmit the infection to mice. An isolate from an infected cat was capable of infecting dogs. The available experimental evidence suggests that an inter-oral route of transmission is more likely than fecal-oral.<sup>6</sup>

Direct passage of *Helicobacter spp.* from animals to humans has not been shown to occur. A laboratory worker was thought to become infected with *G. hominis* via contact with feline gastric contents.<sup>5</sup> These were laboratory cats that were being necropsied at the termination of experiments unre-

lated to gastric spirillosis. The infection resulted in an acute gastritis that required treatment. The disappearance of the organisms was coincident with resolution of the gastritis. Recent isolation of *H. pylori* from commercially obtained cats suggested to researchers that the domestic cat may act as a reservoir for *H. pylori*.<sup>3</sup> Continuing an anthropocentric tradition as old as the ages, no one has suggested that cats become infected through contact with humans. ■

<sup>a</sup> The term "*Helicobacter spp.*" refers to *H. pylori*, *H. felis*, *H. mustelae* and *G. hominis*.

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## Fibrodysplasia Ossificans Progressiva in Cats: A Potentially Important Animal Model of the Human Disease

Beth A. Valentine, D.V.M., Ph.D. and Frederick S. Kaplan, M.D.

A bizarre and disabling disease of humans, known as fibrodysplasia ossificans progressiva (FOP), also occurs in cats. Fibrous tissue, cartilage, and bone form within the fascia of the musculature, as well as in tendons and ligaments, resulting in pain and severe progressive loss of function of all affected body areas. This disease is rare in both humans (approximately 100 known human cases in the United States) and cats. While most human cases are presumed to occur by spontaneous mutation, there is also strong evidence for autosomal dominant inheritance.<sup>1</sup> Only a few cases have been reported in cats, and it is not yet clear whether this rare feline disease is inherited. Currently, no effective therapy exists for FOP in either man or cats.

A review of six cases of feline FOP suggests that it is generally a disease of young cats (age range 10 months to 6 years) occurring in domestic shorthair (2 cases) and domestic longhair (4 cases) cats. Affected cats initially developed a vague and ill-defined illness, followed by development of progressive stiffness of their gait, frequently associated with pain on handling. In some cases this was associated with a mild fever and/or regional lymphadenopathy. Radiography demonstrated dramatic soft tissue mineralization and ossification within muscle fascia and tendons, and pathologic studies documented the fibrous tissue thickening associated with multiple areas of cartilage and bone formation.<sup>3</sup>

The cause of this disease in cats and man is not known, but there is a group of physicians and researchers at the University of Pennsylvania School of Medicine that is dedicated to the study of FOP in humans. The group is pursuing the study of proteins involved in the formation of bone (bone morphogenetic proteins), defects of which could be involved in

the pathogenesis of FOP.<sup>2</sup> Dr. Frederick S. Kaplan, M.D. has expressed a strong interest in trying to understand the feline disease, as he feels that feline FOP could prove to be an excellent animal model of human FOP. Such studies could lead to better diagnostic tools and effective treatments for both feline and human FOP patients. ■

*The clinical expertise of Drs. John Randolph and Sharon Center at the College of Veterinary Medicine, Cornell University is gratefully acknowledged.*

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### Request for Feline Fibrodysplasia Ossificans Progressiva Cases

Dr. Valentine is a veterinary pathologist at the College of Veterinary Medicine at Cornell University with a special interest in neuromuscular disease. Questions or consultations regarding suspected cases of feline fibrodysplasia ossificans progressiva should be directed to Dr. Valentine, c/o Feline Health Center, College of Veterinary Medicine, Cornell University, Ithaca, NY 14853; FAX: (607) 253-3419; or call (607) 253-3414.

For any questions about fibrodysplasia ossificans progressiva in humans, please write or call Frederick Kaplan, M.D., Chief of Molecular Orthopedics, Hospital of the University of Pennsylvania, Silverstein Pavilion 2nd floor, 3400 Spruce St., Philadelphia, PA 19104; Telephone: (215) 349-8727; FAX: (215) 349-5928.



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We wish to publicly thank the following veterinarians and animal hospitals for participating in the Cornell Feline Health Center's Memorial Program during this past fiscal year (July 1, 1993 through June 30, 1994). The 479 participants represent 36 states and 3 Canadian provinces. We also extend heart felt gratitude to those who have contributed since 1981 (indicated by an asterisk next to the name). Those who contributed \$500 or more receive complimentary professional memberships. If you would like to become involved in this valuable program call (607) 253-3414.

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Gallatin Veterinary Hospital, P.C.—Bozeman MT  
Dr. Karen R. Garelick—Red Hook NY  
Garden State Animal Hospital—Cherry Hill NJ  
Georgetown Pike Veterinary Clinic—Great Falls VA  
German Flats Veterinary Clinic—Ilion NY  
Gerson Animal Hospital, Inc.—Miami FL  
Dr. Robert Bernard Glasser—Long Island City NY  
Glenway Animal Hospital—Cincinnati OH  
Dr. Marcia Gortowski—Saint Anne IL  
Dr. Mitchell Greenberg—Easton CT  
Greenbriar Veterinary Hospital, P.C.—Dallas TX  
Greylock Animal Hospital—North Adams MA  
Dr. Robert M. Groskin—Englewood NJ  
Dr. Martin A. Gruber—Chelmsford MA  
Guilderland Animal Hospital, Inc.—Altamont NY\*  
Hammocks Veterinary Hospital, Inc.—Miami FL  
Dr. Marye Byrd Hankerson—North Wales PA  
Hempstead Animal Hospital—Uniondale NY  
High Valley Veterinary Hospital—Ramona CA  
Highland Animal Hospital—Central Square NY  
Hillsborough Veterinary Hospital—Somerville NJ  
Dr. & Mrs. Robert F. Hirt—W. Seneca NY  
Holly Hill Corporation—Laurel MD  
Homer and Tully Animal Clinics—Homer NY  
Housecall Veterinary Clinic, Inc.—Orlando FL  
Hurley Veterinary Hospital—Kingston NY  
In-Home Feline Veterinary Service—Fairfax VA  
Dr. Christine L. Johnston—Bedford MA  
Just Cats Veterinary Hospital—Stamford CT  
Dr. Sandra A. Justis—Concord NC  
Dr. Stewart L. Ketcham—Lebanon NH  
Dr. Sandra E. Young Klindt—Sacketts Harbor NY  
Kinnelon Veterinary Hospital—Kinnelon NJ  
Kitty's Doctor II—Saint Clair Shores MI  
Dr. Faith Krausman—Upper Montclair NJ  
LaGrange Veterinary Hospital—Lagrangeville NY  
Lakeview Veterinary Hospital, Inc.—New Orleans LA  
Lancaster Small Animal Hospital—Bowmansville NY  
Landmark Animal Hospital—Little Rock AR  
Lansingburgh Veterinary Hospital—Lansingburgh NY  
Laurel Park Animal Hospital—Laurel MD  
Laurelton Animal Hospital—Rochester NY  
Lederer Animal Hospital—Detroit MI  
Dr. Robert K. Lee—New Milford CT  
Dr. JoAnne Leja—Westfield MA  
Dr. Janet Levitt—Burbank CA  
Lewis Veterinary Hospital—Columbia MD  
Lexington-Bedford Animal Hospital—Lexington VA  
Lomas Veterinary Clinic—Albuquerque NM  
Lyndon Veterinary Clinic—Fayetteville NY  
Dr. Neil A. MacKenzie—Westboro MA  
Manetto Hill Animal Clinic, P.C.—Plainview NY  
Manlius Veterinary Hospital—Manlius NY  
Drs. Christopher & William Meehl—Lynnfield MA  
Marina Village Veterinary Clinic—Madison CT  
Dr. Lawrence C. Mauer—Monticello NY  
Manor Veterinary Clinic—Pelham Manor NY  
Mid-Island Animal Hospital—Hicksville NY  
Dr. Judith A. Mikarsky—Daytona Beach FL  
Millburn Veterinary Hospital—Millburn NJ  
Millwood Animal Hospital Ltd.—Millwood NY\*



## Memorial Program 1993-1994

Montague Veterinary Hospital—Montague NJ  
Montgomery Animal Hospital—Rockville MD  
Montrose Animal Health Center—Fairfax VA  
Mt. Nittany Veterinary Hospital—State College PA  
Muddy Creek Animal Care Center, Inc.—Rowley MA  
Dr. Jolene Nagakura—Topsfield MA\*  
Neal Animal Clinic—Lubbock TX  
Newburgh Veterinary Hospital—Newburgh NY  
Newman Animal Clinic—Seekonk MA  
Newport Veterinary Hospital—Newport VT  
Dr. Sara G. Nichols—Concord NH  
North Jersey Animal Hospital—Wayne NJ  
Northern Tier Veterinary Clinic, Inc.—Knoxville PA  
Northside Animal Hospital—Bethlehem PA  
Norwalk Veterinary Hospital—South Norwalk CT  
Norwichtown Veterinary Hospital—Norwich CT  
Oakdale Veterinary Hospital—Oakdale NY  
Oakland Veterinary Hospital—Oakland CA  
Oaks Village Animal Clinic—The Colony TX  
Ocean Park Veterinary Clinic—San Juan PR  
Old Lyme Veterinary Clinic—Old Lyme CT  
Olney Veterinary Hospital, Ltd.—Olney MD  
Paris Hill Veterinary Services—Paris NY  
Park Ridge Animal Hospital—Park Ridge NJ  
Park Veterinary Hospital—Durham NC  
Pendleton Veterinary Clinic—Pendleton OR  
Perring Animal Hospital—Baltimore MD  
Dr. C. Denis Peterson—New York NY  
Pet Health Clinic, PC—Daleville VA  
Petit Brook Veterinary Hospital—Colchester VT  
Pinnacle Peak & Quail Run Animal Hospital—Phoenix AZ  
Pitts Veterinary Hospital—Lincoln NE  
Pittsfield Veterinary Clinic—Edmeston NY  
Pleasant Valley Animal Hospital—Pleasant Valley NY  
Portage Animal Hospital—Kalamazoo MI  
Dr. Nancy M. Prena—Taylor MI  
Quincy Veterinary Clinic—Quincy WA  
Rainbow Pet Care Center—Natrona Heights PA  
Dr. Franklin W. Rapp—Schenectady NY  
Raynham Animal Hospital, Inc.—Raynham MA  
Dr. Janette Relyea—Red Hook NY  
Dr. Lisa Rini—Northport NY  
Rhinebeck Animal Hospital—Rhinebeck NY\*  
Rivergate Veterinary Clinic, P.C.—New York NY  
Riverview Animal Clinic, P.C.—Birmingham AL  
Roanoke Animal Hospital—Roanoke VA  
Dr. Andrea R. Russo—Setauket NY  
Dr. Francie Rubin—Fort Washington PA  
Rye-Harrison Veterinary Hospital—Rye NY\*  
Dr. Mary Beth Rymer—Emeryville CA  
Saddleback Pet Services—Northwood NH  
Saratoga Springs Veterinary Hospital—Saratoga Springs NY  
Saugerties Animal Hospital—Saugerties NY  
Saugus Animal Hospital—Saugus MA  
Dr. Cynthia A. Schmoll—Crownsville MD  
Dr. Steven Schrader—Washington Court House OH  
Dr. Alan B. Schreier—Pleasantville NY  
Dr. Karen L. Seamans-Viapiano—Port Charlotte FL  
Dr. Maurice Serling—Larchmont NY\*  
Seymour Veterinary Hospital, PC—Seymour CT  
Dr. Bruce Sheirr—Staten Island NY  
Sheridan Animal Hospital—Kenmore NY  
Sierra Veterinary Clinic—Stockton CA  
Dr. Stanley Sigel—Turnersville NJ  
Silver Maple Veterinary Clinic—Kutztown PA  
Simplicity Animal Hospital—Keysville VA  
Smithaven Veterinary Hospital—Neconset NY  
Dr. Susan Spreat—Allentown NJ  
Smyrna Animal Hospital—Smyrna DE  
Dr. Edward L. Spindel—Baldwinsville NY  
Somers Animal Hospital—Somers NY  
Southtowns Animal Hospital—W. Seneca NY  
Springville Animal Hospital, P.C.—Springville NY  
Spruce Run Veterinary Hospital—Clinton NJ  
St. Francis Animal Clinic, Inc.—Fall River MA  
St. James Animal Hospital—Saint James NY  
St. Peters Animal Hospital—Saint Peters MO  
Stack Hospital For Pets, Inc.—Fayetteville NY  
Stamford/Springdale Animal Hospital—Stamford CT  
Steele Creek Animal Hospital—Charlotte NC  
Steinway Court Veterinarian—Astoria NY  
Storybook Farm Veterinary Hospital—Victor NY  
Sturbridge Veterinary Hospital—Sturbridge MA  
Suffield Veterinary Hospital—Suffield CT  
Summer Street Cat Clinic—Getzville NY  
The Animal Health Care of Rockland—Spring Valley NY  
The Animal Hospitable Veterinary Clinic—Williamsville NY  
The Animal Hospital of La Jolla—La Jolla CA  
The Animal Inn—Glen Cove NY  
The Bethel Veterinary Clinic—Ferndale NY  
The Cat Clinic of Stillwater—Stillwater OK  
The Cat Hospital—Westmont IL  
The Cat Hospital of Orlando—Altamonte Springs FL  
The Cat Practice Veterinary Hospital—New Orleans LA  
The Companion Animal Hospital, P.C.—Fishkill NY  
The New Haven Central Hospital—New Haven CT

## Memorial Program 1993-1994


The Schulhof Animal Hospital—Westport CT  
Thousand Oaks Veterinary Clinic—San Antonio TX  
Three Notch Veterinary Hospital—Hollywood MD  
Titusville Veterinary Clinic—Titusville PA  
Town & Country Animal Clinic—Olney MD  
Triboro Animal Hospital—Bronx NY\*  
Tucson Small Animal Hospital—Tucson AZ  
Dr. Louis P. Tumulo, Jr.—Rhinebeck NY  
Upper Valley Veterinary Services—Lebanon NH  
Valley Animal Hospital—Owings Mills MD  
Valley Green Veterinary Hospital—Etters PA  
Veterinary House Call Service—Pittsford NY  
Viking Community Animal Hospital—North Canton OH  
Village Animal Clinic—Ardsley NY  
Waterbury-Oxford Veterinary Clinic—Waterbury CT  
Watertown Animal Hospital—Watertown NY  
Wayne Animal Hospital—Wayne NJ  
Dr. Ivan B. Weinstein—Philadelphia PA  
Werner Animal Hospital—Morris Plains NJ

West Hills Animal Hospital—West Hills CA  
West Park Veterinary Services—Houma LA  
West Springfield Animal Hospital—West Springfield MA  
Westchester Veterinary Group—Mohegan Lake NY  
Westfield Animal Clinic, Inc.—Westfield MA  
Westside Animal Clinic—Colorado Springs CO  
Westside Family Pet Clinic—Madison WI  
Weymouth Landing Cat Clinic—Weymouth MA  
White Pine Veterinary Clinic—Park City UT  
Whitehall Animal Hospital—Columbus OH  
Dr. Linda Wilmot—Silver Spring MD  
Woodhaven Kennels—Beallsville MD  
Woolf Animal Hospital, P.A.—Tampa FL

### *Five Ways You Can Help Us to Help Cats*

1. Actively participate in the Feline Memorial Program.
2. Become a Professional Member of the Feline Health Center. Your membership helps to support our educational programs as well as providing many benefits to you.
3. Make a charitable contribution to the Feline Health Center before December 31 to reduce taxes on your 1994 income.
4. Encourage your cat-owning clients to become supporting members. (Our office can supply you with membership applications for cat owners.)
5. If clients indicate an interest in providing funds in their wills to an organization, tell them about the Cornell Feline Health Center. (Our office can provide free copies of our bequest brochure, "How do you say Thank You?") The bequests we receive are primarily the result of veterinarians informing their clients about the Cornell Feline Health Center.

*Please contact our office for more detailed information on the above programs by calling (607) 253-3414.*



## Research Briefs

### Energy Requirements of Cats and Dogs—What goes wrong?

Obesity represents the most common form of malnutrition encountered in small animal practice. When an animal's energy intake exceeds its energy requirement, it leads to an excessive storage of fat. To overcome such a phenomenon, the exact energy requirements of dogs and cats need to be defined. The daily energy requirement of an animal should correspond to the sum of its normal resting energy expenditure, its thermogenesis, and its energy requirement associated with its physical state. The former is affected by intrinsic factors such as body size, body conformation and body composition as well as by environmental parameters (ambient temperature). The latter is affected by the physiological state of the animal (growth, gestation/lactation, aging) and by the amount and type of its activity. (The effects of all these factors on the individual energy requirements of dogs and cats are reviewed in the journal article.)

More scientific information on energy requirements of dogs and cats is clearly necessary to avoid problems of over- or under-feeding. However, there will still be situations where animals become obese because the total energy intake is underestimated. For example, owners often forget to take into account the energy contribution of food eaten outside the regular feeding time.—(*Resource: Int J Obes 18 Suppl. 1:S8-S13, 1994*)

### Left Ventricular Hypertrophy in a Closed Colony of Persian Cats

Hypertrophic cardiomyopathy (HCM) associated with left ventricular hypertrophy (LVH) may be a hereditary disease in cats. A family of Maine Coon cats that carries this defect has been reported. Familial forms of HCM have been documented in man and appear to be autosomal dominant. A defect in the

beta-heavy chain myosin gene has been identified as a cause of this disease in humans. The purpose of this Colorado State University study was to determine if the etiology of LVH in a closed colony of cats was genetic.

A partially inbred colony of Persian-ancestry cats was noted to have a high incidence of heart murmurs. These cats were either hetero- or homozygous for Chediak Higashi Syndrome, an autosomal recessive lysosomal fusion defect. This defect has not been associated with cardiac pathology in cats or other species. Echocardiography of colony members revealed that 15 of 28 cats (54%) had LVH, with some cats as young as 4 months old. Seventeen of 28 cats (61%) also had altered blood flow kinetics detected by color flow and continuous wave Doppler. Fourteen animals were followed with echocardiography over a 6 to 12 month period. Seven of these cats showed progression of cardiac disease, either by increase or development of LVH. Serum chemistry profiles, complete blood counts and serum thyroid hormone levels were within normal limits. Plasma atrial natriuretic factor levels in 4 LVH-affected cats were significantly elevated ( $p < 0.05$ ) as compared to the 5 control cats. Indirect blood pressure measurements were normal to slightly elevated relative to published normal values, but were not significantly different when colony members were compared to control cats. Ophthalmologic exams and histopathology of retinal, renal and pulmonary vasculature have not revealed any changes suggestive of hypertensive disease.

The high incidence of LVH in this colony suggests that the disease is inherited in an autosomal dominant pattern and may serve as a model of the disease in humans. The relationship of this syndrome with hypertension warrants further investigation.—(*Resource: ACVIM Forum, 1994 Proceedings*) ■

## Client Information Brochures

The Cornell Feline Health Center publishes a series of client information brochures that can be useful in your practice. These brochures are written in non-technical terms to help your clients understand how to provide better care for their cats. The brochures are available in packs of 50 per title and cost \$15 per pack for nonmembers (members receive a discount). If you would like to preview the brochures before ordering a quantity for your office, send \$3.00 (covers postage and handling) with your request for the "Brochure Sampler" to: Brochure Orders, Cornell Feline Health Center, College of Veterinary Medicine, Ithaca, NY 14853-6401.

During 1995 three new brochures will be added to the series—*Inflammatory Bowel Disease*, *Hyperthyroidism* and *Diabetes*. We would be interested in knowing if there are other areas in feline medicine that need to be addressed by client information brochures. If so, please send your suggestions to: June Tuttle, Cornell Feline Health Center, College of Veterinary Medicine, Ithaca, NY 14853-6401. Titles currently available are:

**Feline Leukemia Virus** (1992, 9 pages)—The most-asked questions on this viral disease are answered in this brochure, including treatments, prevention and prognosis.

**Feline Infectious Peritonitis** (1991, 5 pages)—Easy-to-read format presents information on the virus, signs of disease, diagnosis, and prevention.

**Feline Immunodeficiency Virus** (1993, 5 pages)—This brochure addresses the various concerns this virus poses including possible transmission to people. It provides the most current information available in veterinary literature regarding this disease.

**Choosing and Caring for Your New Cat** (1994, 7 pages)—This brochure provides a basic guide to cat health care. It addresses topics such as vaccinations, internal and external parasites, nutrition, grooming, and spaying or neutering.

**The Special Needs of the Older Cat** (1994, 7 pages)—The brochure begins by discussing the aging process and its effects on the animal. The second section discusses recommendations for the care of the elderly cat such as nutrition, exercise, and grooming. The third section provides a brief description of the various diseases and disorders that commonly afflict older cats.

**Feeding Your Cat** (1994, 6 pages)—This newly revised brochure explains the 1993 AAFCO nutrition label changes. The brochure also discusses the various types of cat foods available, basic feeding guidelines, dietary considerations (i.e., feline lower urinary tract disease), and common feeding problems.

**Feline Behavior Problems** (1993, 6 pages)—Practical information is provided on how to handle such common behavior problems as house soiling, aggression and destructive behavior. Included is a section on behavior modification techniques.

**Are Parasites Robbing You and Your Cat?** (1988, 5 pages)—This brochure addresses the concerns of internal parasites (roundworms, hookworms, tapeworms and coccidia) and includes the importance of routine fecal exams and treatment. (This brochure is being revised in 1995.)

**Toxoplasmosis** (1994, 6 pages)—Since toxoplasmosis can infect people, considerable attention is given to the life cycle of the parasite, *Toxoplasma gondii*, and ways to minimize human exposure if a cat is infected. It also discusses diagnosis and treatment of the disease in the cat.

**Urinary Obstruction in Cats** (1994, 4 pages)—This newly revised brochure provides the most recent scientific thoughts on the causes of urinary obstruction, treatment, and current feeding recommendations for preventing struvite and urolith formation in the cat's urine. ■

## CORNELL UNIVERSITY WEEKEND SHORT COURSE

# Solving Feline Behavior Problems

April 22–23, 1995

Ithaca, New York

### Program

This intensive course is designed for veterinary practice staff members, cat breeders, boarding facility owners, and other people with a serious interest in cats. It will be taught by faculty and staff members of the Cornell University College of Veterinary Medicine.

### Topics to be covered include:

- Behavioral History
- The Cat Brain and Drug Therapy
- Feline Communication and Spraying
- Housesoiling
- Feline Social Structure
- Aggression
- Feeding and Pica
- Sleep, Sex, and Maternal Behavior
- Development and Temperament Testing

### Faculty

Program instructors are faculty and staff members of the College of Veterinary Medicine, Cornell University: **Dr. Katherine A. Houpt**, Director of the Animal Behavior Clinic and Professor of Veterinary Physiology; **Dr. Ilana R. Reisner**, Resident in Behavior Medicine in the Animal Behavior Clinic; **Dr. Soraya Juarbe-Díaz**, Resident in Behavior Medicine at the Veterinary Medical Teaching Hospital.

### Accommodations

Rooms have been reserved at the following locations: Best Western University Inn, (607) 272-6100, \$60 single/double; Howard Johnson Lodge, (607) 257-1212, \$45 single/\$55 double; Ramada Inn-Airport, (607) 257-3100, \$66 single/double. The above reduced rates are available if, when you make your reservations, you mention the program by name.

### Program Charge

The program charge is \$285 and includes tuition; course materials; a formal Cornell University certificate of completion; continental breakfasts on Saturday and Sunday; lunch and dinner on Saturday; lunch on Sunday; and refreshment breaks. Persons whose cancellations are received in writing by April 7 will receive a full refund. Cancellations received after April 7 are subject to a \$100 cancellation fee. Substitutions may be made at any time before the program begins. Program costs may be tax deductible.

### Travel Planning

Participants should arrive by 8:30 a.m., Saturday, April 22. The program will conclude by 4:00 p.m. on Sunday, April 23.

### Further Information

**Solving Feline Behavior Problems**, Cornell University, B20 Day Hall, Ithaca, NY 14853-2801; telephone: (607) 255-7259; fax: (607) 255-8942.

### Registration Form

Please print or type:

Name (as you want it to appear on certificate)

Nickname (as you want it to appear on name badge)

Mailing address (to appear on participant list)

( ) ( )  
Day telephone Evening telephone

Please indicate your payment preference:

Enclosed is my check for \$ \_\_\_\_\_ made payable to Cornell University in U.S. dollars and drawn on a bank located in the United States.

Charge my Visa or MasterCard for \$ \_\_\_\_\_

Account number Expiration date  
(specify:  Visa  MasterCard)

Cardholder's signature

Cardholder's name (please print)

Registration should be submitted as soon as possible since enrollment will be limited. Send this form, along with payment or charge authorization, to: **Solving Feline Behavior Problems**, Cornell University, Box 231, B20 Day Hall, Ithaca, NY 14853-2801; Fax (607) 255-8942.

## Novo Nordisk Discontinues Purified Beef Ultralente Insulin

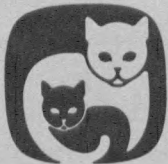
Novo Nordisk Pharmaceuticals Inc. discontinued the production of purified beef Ultralente insulin on September 15, 1994. Eli Lilly and Company continues to produce mixed beef/pork (Iletin I) insulin in regular, NPH, and Lente preparations in addition to Humulin U, a human recombinant Ultralente insulin preparation. Lilly indicates that there are no immediate plans to discontinue the current line of animal-source insulin products.

Past experience has shown that once daily administration of either Humulin U or purified beef Ultralente fails to achieve satisfactory regulation in the majority of cats. As a result, cats requiring insulin will likely benefit most by twice daily administration of either beef/pork (Iletin I) NPH or Lente insulin.

Attempts at regulation with once daily administration of Humulin U should be reserved for cats whose owners are unable to administer medication more frequently. ■

### *Important Notice*

**Our offices will be closed for the holidays from December 24 through January 2.**



Cornell Feline Health Center  
Cornell University  
College of Veterinary Medicine  
Ithaca, New York 14853