

# Cornell Feline Health Center Veterinary News

Winter 1985

## Radiographic Evaluation of the Dyspneic Cat

Amy Dietze, D.V.M., DACVR

Dyspnea is a serious problem that is easily recognized by cat owners as requiring veterinary assistance. Radiography is an extremely useful tool for assessing the dyspneic cat. Following a complete history taking and physical exam, radiography of the thorax will often confirm a diagnosis and treatment or provide information that will be valuable in choosing additional diagnostic tests.

A wide range of disease conditions can cause dyspnea (see Table I)<sup>1</sup>. Thoracic radiography will readily identify and distinguish between thoracic airway obstruction, extrapulmonary disease impairing lung inflation, primary pulmonary disease, and cardiovascular disease.

Occasionally dyspneic cats will have normal thoracic radiographs. Metabolic and nervous diseases, upper airway obstruction, pulmonary thromboembolism, and diseases affecting the oxygen carrying capacity of blood may have normal thoracic radiographs.

Dyspneic cats are especially sensitive to stress. Such a cat may spontaneously expire when stressed. Thoracic radiographs should not be obtained at the expense of the cat. Oftentimes the patient is so debilitated that it will remain on the X-ray cassette without physical restraint. When restraint is needed passive restraint techniques such as using sand bags will allow radiography of most dysp-

neic cats without undue stresses. Tranquilization of critically ill cats is contraindicated as a means of control.

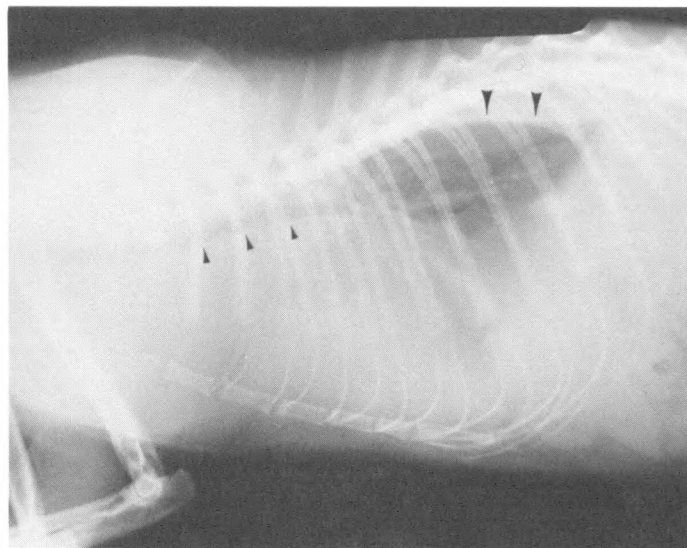
### Evaluating Radiographs

Evaluation of thoracic radiographs of dyspneic cats should begin with visual examination of the extra-thoracic areas. This may contribute valuable information which otherwise may be overlooked. Next, the thoracic structures should be methodically assessed, even though a large lesion may be distractingly obvious. The areas that should be specifically noted as being normal or abnormal are the trachea and larger bronchi, the pulmonary parenchyma, the cardiac silhouette and vascular structures, and the pleural space.

The following cases, presented at Cornell's Small Animal Clinic, demonstrate the effectiveness of thoracic radiography in evaluation of the dyspneic feline.

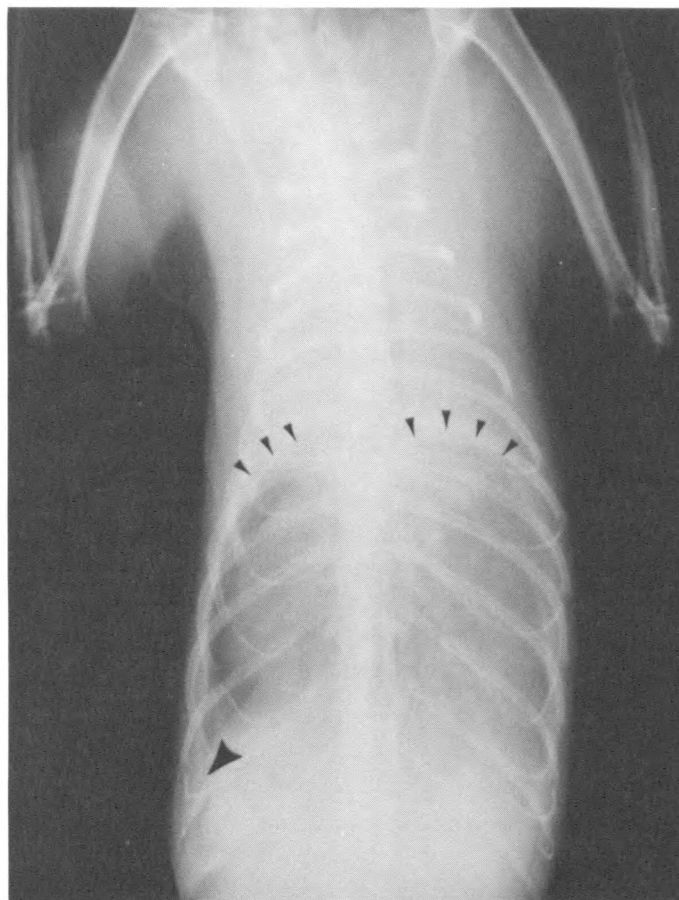
### CASE I

History: This adult, castrated male, domestic shorthair cat has been listless and dyspneic for the past several days. He began coughing three weeks prior to presentation and had been hit by a car the previous year, sustaining a coxofemoral luxation.



1A

**Radiographic Interpretation:** The thorax is greatly opacified by extrapulmonary density. There is a moderate amount of pleural fluid contributing to the opacification of the thorax, leafing between lung lobes, and obscuring the cardiac and diaphragmatic silhouettes. Pleural fluid is seen separating the aerated lung border from



1B

the body wall (Figs. 1A and 1B, large arrows). However, the majority of the increased soft tissue density visualized in these radiographs is a mass that occupies the cranial thorax. In the lateral view the mass elevated the trachea against the spine (Fig. 1A, small arrows). In the dorsoventral view the lung is caudally displaced to the seventh intercostal space (Fig. 1B, small arrows). The lung of the normal cat reaches to the first rib. From these radiographs a presumptive diagnosis of lymphosarcoma of the cranial mediastinum is made.

#### Further Diagnostic Tests:

- Feline Leukemia ELISA test was positive.
- Thoracic fluid contained many lymphoblasts.

## *Veterinary News*

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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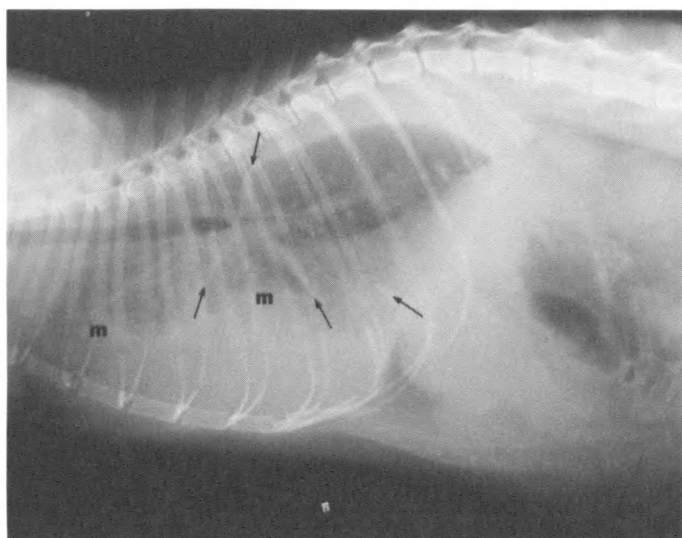
Special Consultant: **Leo A. Wuori, D.V.M.**

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## CASE II

History: The owner noted a fetid odor to the breath of her 7 year-old, domestic shorthair, castrated male cat. The cat has experienced severe dyspnea for the past four days.



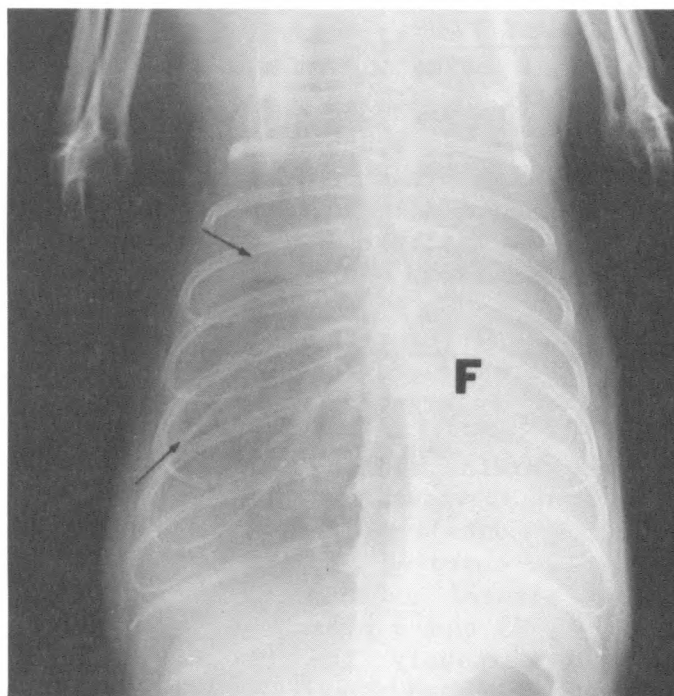
2A

Radiographic Interpretation: There is a large amount of pleural fluid. The fluid is seen leafing between lung lobes (Figs. 2A and 2B, arrows). In the lateral view loculated pleural fluid has caused scalloping of the ventral lung border (Fig. 2A,m). The dorsoventral view clearly shows that the distribution of pleural fluid is asymmetrical. The left hemithorax is completely opacified and the left lung lobes are completely atelectic (Fig. 2B,F). Uneven distribution of pleural fluid is indicative of an exudate. Pyothorax or occasionally chylothorax could create these radiographic changes.

### Further Diagnostic Tests:

- Thoracocentesis removed 255 ml of pus from the pleural space.

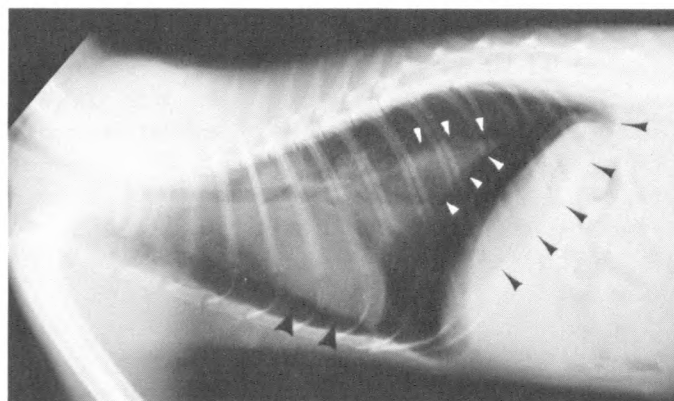
- The pleural exudate was cultured and grew Pasturella multocida.



2B

## CASE III

History: This 7 month-old female, domestic shorthair cat was hit by a car and was dyspneic.



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Radiographic Interpretation: A tension pneumothorax is diagnosed. Atelectic lung lobes are outlined by air which is free in the pleural space (Fig. 3, small arrows). The pleural space is overinflated. It extends to the second lumbar vertebra (Fig. 3, medium arrows). The cardiac silhouette is elevated off the sternum (Fig. 3, large arrows).



**CASE IV**

**History:** A 5 year-old, female, domestic short-hair cat was presented with an acute onset of dyspnea and collapse of one day duration.

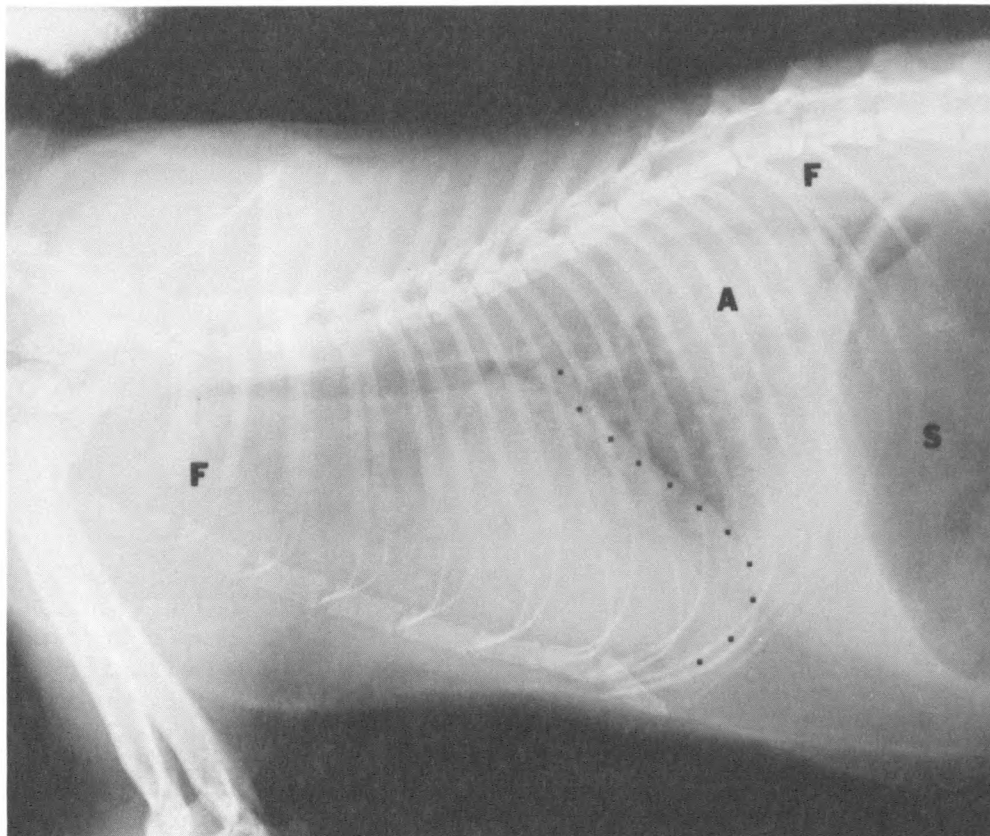
**Radiograph Interpretation:** There is marked cardiac enlargement. Only the caudal border of the cardiac silhouette is visualized (Fig. 4, dots). The rest is obscured by free pleural fluid (Fig. 4, F) and a pronounced pulmonary infiltrate. Throughout all lung fields an interstitial density obscures the shadows of normal pulmonary vessels. In the caudal lung field (Fig. 4, A) there is a focal patch of alveolar lung density. In view of the cardiac enlargement, the interstitial and alveolar pulmonary infiltrates are likely to be cardiogenic pulmonary edema secondary to left-sided heart failure. The free pleural fluid is probably caused by right-sided heart failure. The stomach (Fig. 4, S) is distended with air due to the dyspnea.

**Further Diagnostic Tests:**

- Fluid retrieved by thoracocentesis was a modified transudate.
- The results of echocardiography were consistent with congestive cardiomyopathy.

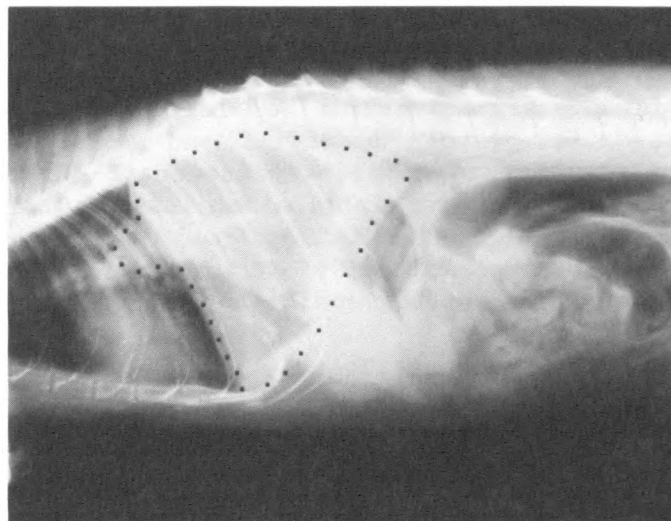
**CASE V**

**History:** One week ago this 14 year-old, spayed female Persian cat became anorexic,

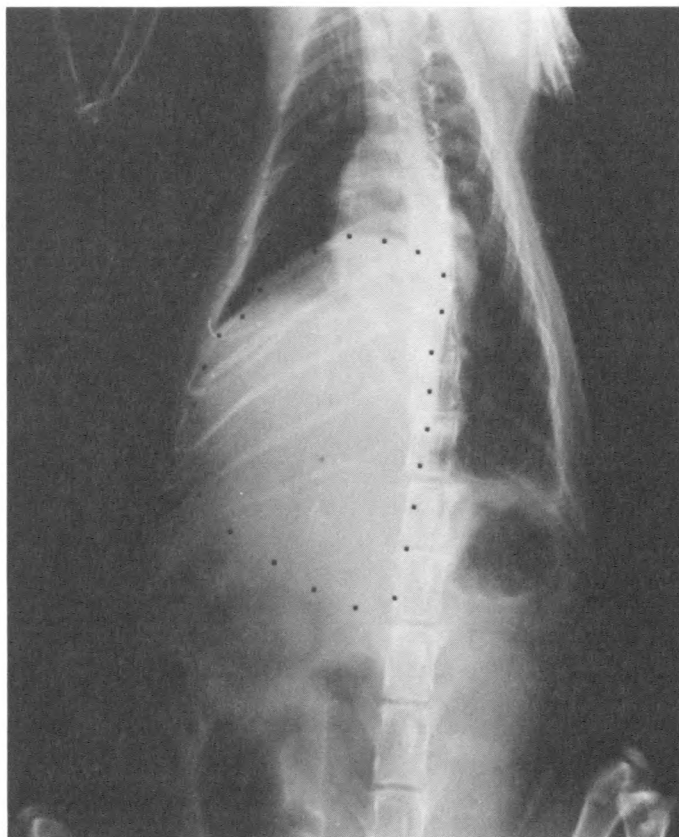


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began coughing, and was dyspneic. The dyspnea increased throughout the week.



5A



5B

**Radiographic Interpretation:** The right caudal lung lobe is occupied by a large soft tissue mass (Figs. 5A and 5B, outlining dots). A primary lung tumor would most likely create a solitary, intrapulmonary mass.

**Further Diagnostic Tests:**

- A needle aspirate of the lung mass contained neoplastic cells.
- Postmortem histologic diagnosis of the lung mass was lung carcinoma.

**CASE VI**

**History:** This adult, male, domestic short-hair cat exhibited depression, lethargy, and anorexia for four weeks. At presentation the cat was dyspneic, coughing, and emaciated.

**TABLE I Differential Diagnosis of Dyspnea**

**I. Airway Obstruction**

- |   |                    |
|---|--------------------|
| a) inflammatory: infectious, allergic, foreign body | c) neoplasia       |
| b) neoplastic                                       | d) pulmonary edema |
| c) traumatic  | e) trauma          |
| d) laryngeal paralysis                              |                    |

**II. Extrapulmonary Disease Impairing Lung Expansion**

- a) hydrothorax
- b) pneumothorax
- c) diaphragmatic hernia
- d) cardiomegaly
- e) pain
- f) cranially displaced diaphragm: ascites, hepatomegaly
- g) neoplasia
- h) obesity
- i) abnormalities sternum or spine

**III. Primary Pulmonary Disease**

- a) pneumonia
- b) bronchitis

**IV. Cardiovascular Disease**

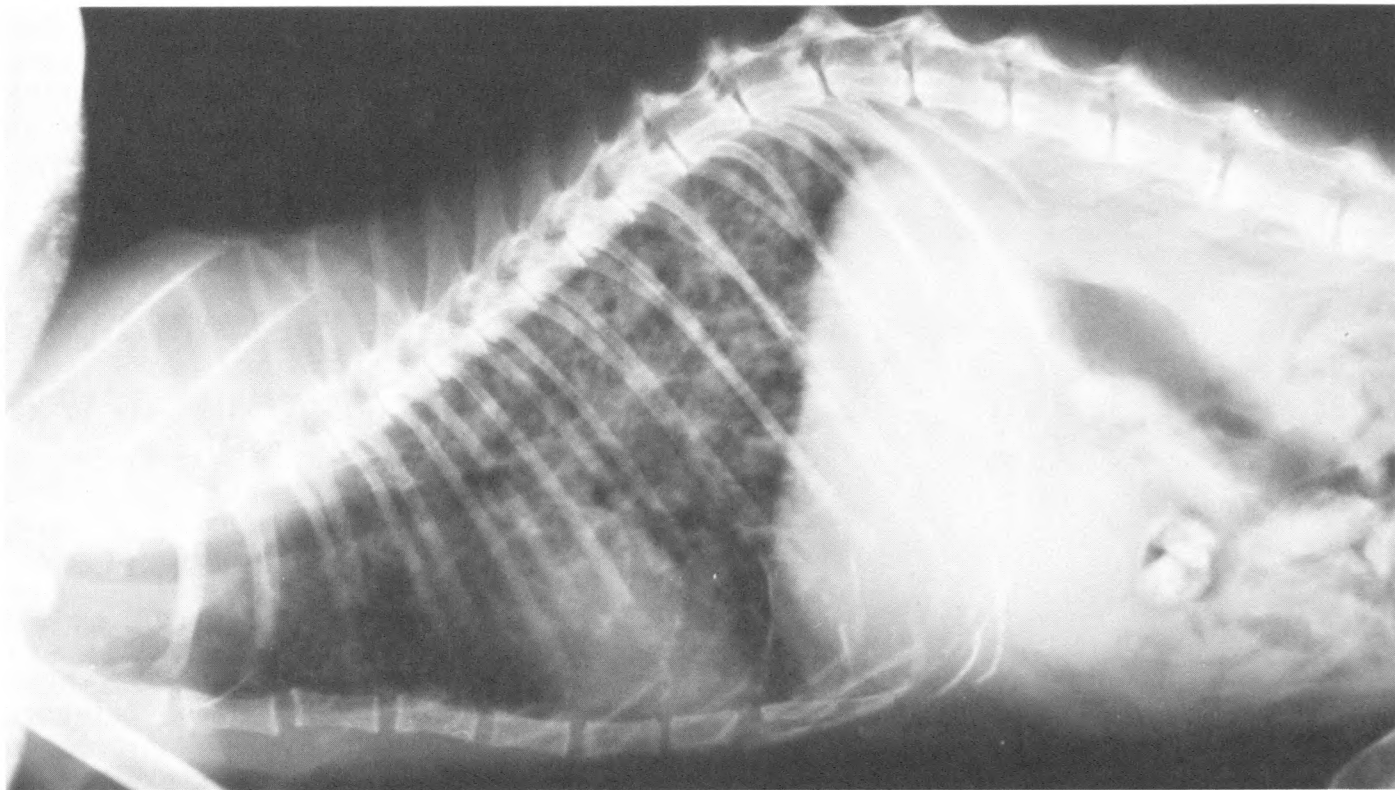
- a) cardiac failure
- b) aortic/pulmonary emboli
- c) anemia
- d) shock
- e) hemoglobin disorders
- f) heat stroke

**V. Metabolic**

- a) acidosis
- b) alkalosis

**VI. Nervous or Emotional Disorders**

- a) brain tumor
- b) fear
- c) pain
- d) fever



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**Radiographic Interpretation:** The lateral radiograph clearly demonstrates a severe interstitial lung density that is seen throughout all lung fields obscuring normal pulmonary vasculature. This interstitial lung pattern is characterized as both unstructured linear densities and ill-defined nodules. This radiographic appearance may represent a chronic pneumonia or pulmonary neoplasia.

#### Further Diagnostic Tests:

- Tracheal wash cytology was normal.
- Postmortem histopathology of the lung was adenocarcinoma of the lung.

#### **Summary**

The preceeding cases were presented without physical examination findings to illustrate that radiographs alone can give a

good estimation of the disease process causing dyspnea. In the clinical setting radiographs are not interpreted blindly. Radiographic findings coupled with the abnormalities found during physical examination result in a more accurate diagnosis and effective treatment of the dyspneic cat. ■

#### **REFERENCE:**

1. Pechman, R.D.: Newer Knowledge of Feline Bronchopulmonary Disease, Vet Clinics North America, Saunders 14L5:1007-1020, 1984.

*Amy Dietze is a 1979 graduate of the College of Veterinary Medicine, Cornell University. Her internship and residency were in radiology at Cornell University. Presently she is an assistant professor at the College of Veterinary Medicine, Cornell University.*



## Cornell Develops New Computer Program for Veterinarians

June E. Tuttle

How long would it take you to find information on giardiasis? Perhaps five minutes...maybe even longer? After you retrieve the information is it up-to-date? Today it's possible to let a computer do the search for you in less than 60 seconds.

In the Fall 1983 issue of "Veterinary News" we featured an article on a computer diagnostic program, PROVIDES. In this issue we will look at another program, CONSULTANT, that has been developed.

CONSULTANT lists 450 clinical signs and 5,300 diseases of small and large animals. (Feline diseases total 661.) This data-base program was developed at Cornell University's College of Veterinary Medicine by Dr. Maurice E. White, Dr. Michael Powers, and John Lewkowicz.

"The purpose of the program is to provide what textbooks can't... fast and easy

access to thousands of diseases and clinical signs," comments Dr. White.

### Using CONSULTANT

The program is easy to use. When you first begin the program you have a choice of entering various clinical signs and then let the computer sort out the information, providing you with a list of diseases which display those particular signs. If you have diagnosed the disease but want additional information on it then you can enter just the disease and you will receive a brief summary of the disease, clinical signs and references.

The references are updated on a daily basis. Dr. White estimates that he updates at least 1000 references per year.

According to Dr. White, the program is most beneficial to the practitioner when

*(continued on next page)*

## FIP Client Brochure Now Available

Feline Infectious Peritonitis is a baffling disease for professionals in veterinary medicine. Think how much more confusing it is for your clients to understand. We recently published a comprehensive client information brochure on FIP. It is written in a question and answer format. It is easy to read and the explanations use common phrases instead of being weighted down with medical jargon.

To order copies for your office simply complete the coupon below and return with a check or money order made out to the Cornell Feline Health Center. Allow 6 to 8 weeks for delivery.

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dealing with an unusual case or if you are trying to locate references on a particular disease.

CONSULTANT will never replace the practitioner because it is the practitioner who must accurately determine the diagnosis based on history, signs and laboratory results. The computer is an aid similar to a textbook; the only difference is that information can be obtained quickly and it is updated on a daily basis.

## Getting Started

You only need a few basic pieces of hardware to access CONSULTANT: a terminal, 1200 baud modem, and printer (optional). The initial fee is \$75 for which you will receive a password, telephone number, instructions, and electronic mail option. Thereafter, the fee is \$25 per hour which includes the cost for using Telenet. Billings will be sent out on a monthly basis.

"CONSULTANT could be a good practice builder and create good will with the client," says Dr. White. Computers are highly respected by the public, therefore using such a system to aid in diagnosis could have a positive impact on your clientele.

CONSULTANT will be demonstrated at the January 1985 Veterinary Conference at Cornell University and at the Eastern States Conference in Florida.

For further information on CONSULTANT or to sign-up for this computer service contact John Lewkowicz, College of Veterinary Medicine, 624 VRT, Cornell University, Ithaca, NY 14853. ■

Are you a veterinary student looking for summer employment? The Cornell Feline Health Center is offering a Summer Research Fellowship program. The program is made possible through a grant by the Birmingham Feline Fanciers, Inc.

This is an excellent opportunity to work specifically in the area of feline medicine. A stipend is provided to cover living expenses during the three-month fellowship.

Inquiries or requests for applications should be sent to:

Cornell Feline Health Center  
Cornell University  
College of Veterinary Medicine  
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