

## Organization and Function of the Veterinary Clinical Pharmacology Study Unit

Thomas E. Powers, DVM, PhD\* and Jean D. Powers, PhD

This discussion is based upon the programs in veterinary clinical pharmacology as they now exist at the University of Illinois and The Ohio State University.<sup>1,2</sup> Although there are some differences in the two programs, the overall philosophy regarding the training required for a graduate clinical pharmacologist is essentially the same. Since I am more familiar with the program at Ohio State, I have emphasized its requirements in many of the discussions. The specific descriptions of each program are available from Dr. Lloyd Davis at the College of Veterinary Medicine, University of Illinois at Urbana-Champaign, 1102 W. Hazelwood Drive, Urbana, IL 61801 and/or Dr. Thomas E. Powers, Veterinary Physiology and Pharmacology, The Ohio State University, 1900 Coffey Road, Columbus, OH 43210-1092.

Organization of the veterinary clinical pharmacology study unit--At The Ohio State University the veterinary clinical pharmacology study unit is composed of faculty whose interests and training are in pharmacology and related fields and resident graduate students which are receiving their training in veterinary clinical pharmacology. Before describing the faculty duties and the training program for the resident graduate students, it is necessary to give a definition of a veterinary clinical pharmacologists.

Definition of veterinary clinical pharmacologist (VCP)--Veterinary clinical pharmacology is that portion of veterinary medical practice that deals with the efficacy and safety of chemical entities used in the therapy and alleviation of disease and disease signs of animal species. In addition, the veterinary clinical pharmacologists must also be concerned with the environmental impact of the use of these chemicals; especially, their effects if introduced into the food chain and how to prevent this from occurring. In other words veterinary clinical pharmacology is a specialist in the effects of drugs in animal patients. It is his obligation to maintain his skills and expertise in the above areas.

This area of veterinary practice is the one in which the practitioner can become dated in a very short time, since new groups of drugs and new approaches to drug therapy are constantly being developed. Many of the therapeutic regimens one uses today were not developed 5-10 years ago and this pace is expected to increase with new changes in federal regulations.

Since a veterinary clinical pharmacologist (VCP) must first be oriented toward the practice of veterinary medicine, this restricts the field of study to graduate veterinarians.

The VCP possesses the knowledge, skills, and special interests that are required to care for and to offer consultative services concerning the

\* Professor, Veterinary Physiology and Pharmacology, The Ohio State University, 1900 Coffey Road, Columbus, OH 43210-1092.

use of various drugs in the treatment of various animal species. The VCP should have the capability in certain areas of pharmacology to assume the responsibility of decision as to the appropriateness of therapy regarding:

1. Drugs of choice (primary-secondary choices)
2. Proper dosage form
3. Proper dosage regimen
4. Selection of routes of administration
5. Need for drug monitoring
6. Precautionary requirements
7. Management of toxic reactions
8. Management of drug interactions
9. Proper duration of therapy
10. Assaying effectiveness and safety by epidemiological methods.

In addition to the above, the VCP will be expected to:

1. participate on pharmaceutical and biological committees
2. participate in drug research efforts with medical, surgical, and other specialties
3. assume the educational responsibility to the profession
4. have a knowledge of the impact of local, state, and federal regulations on drug therapy
5. design, conduct, and report preclinical and clinical pharmacology research studies using the highest ethical and moral standards
6. encourage the rational and economical usage of drugs in the practice of veterinary medicine

Objectives--The primary objective is to provide an educational program for graduate and professional students in the effective and rational clinical use of drugs. This can be accomplished by (1) providing a program of graduate/resident study in clinical pharmacology for graduate veterinarians, (2) development of a program of study for junior and senior veterinary students in clinical pharmacology as a part of their clinical rotations, (3) providing a service to clinicians (faculty, residents and professional students) on a consulting basis in the fields of pharmacology, (4) conducting clinical pharmacological investigations in

cooperation with attending clinicians, residents, professional students and other allied personnel, and (5) establishment of a Drug Monitoring Laboratory under the Clinical Pharmacology Study Unit.

#### VCP faculty duties

The specific duties of the faculty of the Clinical Pharmacology Study Unit, in addition to participating in the seminars and individual and daily conferences with clinical pharmacology residents, will be to serve as consultants to residents, clinical staff and professional students, participating in clinical rounds as appropriate, assuming other duties as assigned by the clinical pharmacology section head, conduct research, oversee drug monitoring laboratory, and teach courses in pharmacology, toxicology, statistics, physiology, pharmacokinetics, etc.

#### Resident duties of graduate students in VCP

The specific duties of clinical pharmacology residents involve participating in ward rounds (1-2/day); consulting basis only, no case responsibility, except specific duties as assigned by the attending clinician (for example ICU) and approved by the head of Clinical Pharmacology Study Unit, follow-up consultation on cases as needed, various duties assigned by the section, and daily individual conferences with the clinical pharmacology faculty. The conferences entail discussion of the clinical cases so as to result in a resolution of problems of therapy. Two one-hour weekly seminars are presented by the residents and faculty. Topics are selected and assigned by the faculty, and include (a) drug usages in the critical care patient, (b) therapy of the diseased state: emphasis on specific disease effect on animal's ability to absorb, metabolize and excrete drugs, (c) problems encountered in multiple drug therapy, (d) emergency medication, (e) therapy in selected clinical cases, (f) use and misuse of antimicrobial therapy and (g) other topics as deemed appropriate by the VCP faculty.

Training program in clinical pharmacology--A three-year program of training in veterinary clinical pharmacology is offered by the Clinical Pharmacology Studies Unit of the Department of Veterinary Physiology and Pharmacology of the College of Veterinary Medicine, The Ohio State University at Columbus, Ohio.

The program is designed to train VCP to deal with practical problems in drug therapy, to assess in an unbiased manner the effects of therapy in the individual patient and groups of patients of the several domesticated species, to acquire a knowledge of sciences fundamental to comparative pharmacology, to acquire experience with techniques used in investigations in clinical pharmacology and to develop a proper understanding of experimental design and analysis.

One year is spent in intensive study and course work to fulfill academic course credit requirement for the M.Sc. degree and to obtain depth of knowledge in pharmacology. During this period clinical responsibilities will be minimal (usually 50% of full time equivalent or less). This work will provide sufficient expertise in comparative pharmacology to enable

the trainee to maximally utilize his or her opportunities in the clinical setting during the last two years of the program.

One year of training in research in clinical and comparative pharmacology. During this period the trainee undertakes one or more research projects in comparative pharmacology or experimental therapeutics. Trainees are expected to plan and complete a research program that will fulfill the requirements for the M.Sc. degree in the Department of Veterinary Physiology and Pharmacology.

One year of full time clinical training at an advanced residency level in the Clinical Pharmacology Studies Unit of the Veterinary Medical Teaching Hospital. During this period the trainee will receive clinical training in equine, food animal, canine and feline internal medicine with particular emphasis on drug therapy. During this period the trainees are responsible for the active consulting service of the Unit. During this period the trainee also will spend time in the pharmaceutical industry and the Food and Drug Administration to develop an appreciation of matters concerning drug development, production, costs, regulation and quality control.

It must be emphasized that the three years of training are not clearly delineated one from another and the assignment of duties is kept flexible so that trainees may take advantage of the availability of patients for their studies. However, the trainees are expected to put major emphasis on the M.Sc. degree program for the first two years with the clinical experience beginning the first year and increasing to major emphasis in the clinics the third year. Trainees are expected to complete a number of didactic courses during their training and to complete the requirements for the M.Sc. degree in accordance with the rules of the graduate faculty of the Department of Veterinary Physiology and Pharmacology.

Certification of training--Upon successful completion of the training program the resident will receive the M.Sc. degree from the Graduate School of The Ohio State University, and a certificate from the Department of Veterinary Physiology and Pharmacology of the College of Veterinary Medicine indicating satisfactory completion of the residency in clinical pharmacology.

Efforts are currently underway to establish a certifying board for clinical pharmacology in conjunction with the American Academy of Veterinary Pharmacology and Therapeutics. This will provide a mechanism for the certification of people in this clinical specialty.

#### Summary of functions of Veterinary Clinical Pharmacology Study Unit--

1. Teaching
  - a. Professional students
  - b. Interns - residents
  - c. Practitioners via consultation, seminars, meetings, etc.

2. Patient care
  - a. Consultation - usual function of Veterinary Clinical Pharmacologist
  - b. Primary case responsibility - in selected situations
  - c. Therapeutic drug monitoring
3. Research - especially important as relates to this symposium
  - a. Clinical Studies (drug evaluation); must be supported financially by:
    - 1'. Pharmaceutical industry
    - 2'. Food and Drug Administration
    - 3'. Academia
    - 4'. Other agencies
  - b. Basic research

References--

1. Lloyd Davis, "Residency Program in Veterinary Clinical Pharmacology at The College of Veterinary Medicine, University of Illinois," 26 pages.
2. T. E. Powers, "Graduate/Residency Program in Veterinary Clinical Pharmacology in the Department of Veterinary Physiology and Pharmacology at The Ohio State University," 6 pages.