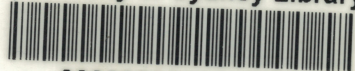


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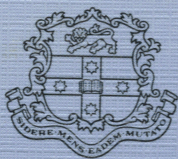
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# Antimicrobial Prescribing Guidelines for Veterinarians

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Editor: B S Cooper

2ND EDITION



University of Sydney

In association with:

National Health & Medical Research Council

UNIVERSITY OF SYDNEY  
Badham



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## Disclaimer

In preparing this book care has been taken to ensure accuracy of dose rates. It is possible, however, that some errors may appear. Clinicians are urged to read manufacturers' direction carefully when administering medications.

Where authors advise different dose rates, clinicians should consider manufacturers' recommendations and use their own clinical judgement.

Anyone finding errors in dose rates is urged to notify The Director, Post Graduate Foundation in Veterinary Science, University of Sydney.  
(Tel: (02) 9351 7979)

## Foreword

Antibiotics are the most commonly used drugs in veterinary, as in human, medicine. As with any drugs, this implies a significant cost and potential toxic or other unwanted side-effects. However, antibiotics differ from other drugs in that by selection of antibiotics-resistant bacteria they can affect both the environment and members of a population other than those actually treated.

In human medicine, the emergence of resistance in bacteria responsible for serious community and hospital-acquired infections has caused concern since antibiotics first became widely available over 40 years ago. The development of new agents, designed to overcome bacterial resistance has barely kept pace and those which have been developed are usually many times more expensive than older agents.

The prospect of untreatable bacterial infection (still largely theoretical but occasionally a reality) and rising drug bills have led to development of guidelines for and restrictions on the use of antibiotics especially in hospital practice. Australia has been at the forefront with the publication, in 1979, of a small antibiotic guidelines booklet written by a group of Melbourne specialists concerned about often inappropriate use of antibiotics and the increasing clinical problem of serious infections caused by multiresistant *Staphylococcus aureus* in Melbourne hospitals.

The 8<sup>th</sup> edition of "Antimicrobial Guidelines" is now in preparation; it is published by the Victorian Postgraduate Medical Foundation with contributions from clinicians, microbiologists and pharmacists from all Australian states and wide national circulation among doctors in hospital and community practice. In 1984, "Antimicrobial Guidelines" was endorsed by the Antibiotic Standing Committee of the National Health and Medical Research Council as a blueprint for antibiotic use in human medicine in Australia.

The Antibiotic Standing Committee had been formed by the NH&MRC in the 1960s in response to widespread concern about transmissible antibiotic resistance and the possible implications of increasing use of antibiotics in medical and veterinary practice. The committee's terms of reference include inter alia "To give advice to NH&MRC on: ... uses of antibiotics and their

effects in medical, veterinary and agricultural contexts ... (and on) ... methods of control of antibiotic resistance in health care establishments, the general community and primary industry."

In response to this continuing responsibility, the Expert Panel on Antibiotics (EPA) - as the former Standing Committee is now called - has continued to explore ways to improve the use of antibiotics in all areas of practice. In 1991 it recognised a need for easily accessible and locally relevant information for veterinarians comparable to that in "Antibiotic Guidelines". The publication of "Veterinary Antimicrobial Prescribing Guidelines" is a response to that need by the Post Graduate Foundation in Veterinary Science, on the initiative of Dr Douglas Bryden, member of the EPA and Director of the Foundation.

The editor, Professor Brian Cooper, has gathered a formidable group of authors whose academic knowledge, clinical experience and local expertise in many areas of veterinary medicine, have contributed to the production of a unique resource for veterinary practitioners. The recommendations are clearly presented and accessible and supported by useful background information. On behalf of the EPI I congratulate the Foundation and all those involved in the publication of this book on their achievement and recommend it to veterinarians as a practical contribution to improving the use of antibiotics and retarding the emergence of bacteria resistance.

G L Gilbert, Professor and Director of Clinical Microbiology Centre for Infectious Diseases and Microbiology University of Sydney, Westmead Hospital Chair, NH&MRC Expert Panel on Antibiotics.

## *Professional Profiles*

### **Michael J Cannon BVSc MACVSc (Avian Health) Grad Dip Ed**

Graduated from University of Sydney in 1976. Private practice in Forestville until 1979, then moved to private practice in Wollongong until present. MACVSc by examination in Avian Health in 1985.

President - Avicultural Society of NSW 1989-1991

Chairman - Research and Development Subcommittee of Avicultural Federation and Development Subcommittee of Avicultural Federation of Australia since 1986.

Developed and maintained an interest in avian medicine and surgery since graduation. Maintains a small collection of Australian Parrots and is involved in rehabilitation of Australian native animals, particularly birds.

Teacher-in-charge Zookeeping-- Sydney Institute of Technology since 1990.

President Australian Branch, Association of Avian Veterinarians 1992-1993

President Avian Health Chapter, Australian College Veterinary Scientists since 1992.

Consultant Veterinarian to Australian Wildlife Park, Eastern Creek, since 1990.

Address: 9 Norman Street  
MANGERTON NSW 2500

Telephone: (02) 4229 8888

### **Brian S Cooper FRCVS PhD FACVSc**

Associate Professor in Veterinary Clinical Pharmacology in the Faculty of Veterinary Science, Massey University, New Zealand from 1976 till June 1992. Chairman of the Technical Audit-Group of the Animal Remedies Board.

Spent some years in clinical practice in England and New Zealand after qualifying MRCVS from the Royal Veterinary College, London in 1951. Then spent nineteen years in the pharmaceutical industry involved with pharmaceutical product and vaccine research and development and field evaluation.

Address: 54 Te Awe Awe Street  
Palmerston North  
New Zealand

Telephone: (06) 357 6536

### **Peter Howe BVSc (Hons) PhD MACVSc**

Ex-rural practitioner (17 years) and practice principal, four years in the biotechnology industry while studying for a PhD on Semen Biochemistry and Cryopreservation of Sperm. Director of Howe Watts and Co. Pty Ltd, an animal production consultancy company which deals primarily with fleece producing animals, sheep and goats.

Address: Leslie Street Veterinary Clinic  
Leslie Street  
UMINA NSW 2257

Telephone: (02) 4342 0500

### **Hulst F A (Frances) BVSc (Hons) MVS (Wildlife Medicine and Husbandry)**

Dr Hulst graduated from the University of Sydney in 1982, and then worked in private practice for a number of years before travelling overseas. On return to Australia, she worked in a research position for a short time and then started as Veterinary Intern at Taronga Zoo in 1991. She completed her Master of Veterinary Studies in Wildlife Medicine and Husbandry the following year, with research into the haematology and biochemistry of the diamond python. Following on from her internship, Dr Hulst worked as a locum in a number of zoos in Australia, and was employed in her current position as Veterinary Officer at Taronga Zoo in 1995. Dr Hulst's special interests lie in the medicine and husbandry of reptiles, amphibians and fish.

Address: 8 Albert Drive, Killara NSW 2071 Phone: 02 9416 5878 e-mail: [frances\\_vet@1hotmail.com](mailto:frances_vet@1hotmail.com)

**Larry Vogelnest BVSc (Hons) MACVSc (Wildlife Medicine & Husbandry)**

After graduating in 1984 from Sydney University, Dr Vogelnest worked in mixed private practice before travelling overseas and working in England. On return to Australia he worked in an avian practice in Sydney for 12 months before starting as Veterinary Intern with Taronga Zoo. During this time he completed a Masters in Veterinary Studies in Wildlife Medicine & Husbandry. The research for his Masters was on the Haematology and biochemistry of Australian cockatoos. Since completing his internship he has been employed as a Veterinary Officer at Taronga Zoo.

Address: TarongaZoo  
POBox20  
Mosman NSW 2088

Telephone: (02) 9969 2777

**A (David) J Watson BVSc PhD FRCVS FAAVPT MACVSc**

David Watson graduated from Sydney University in 1965 and spent five years in practice in Australia and England before returning to Sydney University to learn and teach small animal medicine. He took sabbatical leave at Cornell University in 1977 and Utrecht University in 1985. In 1992-93 he was a Visiting Professor at the University of Wisconsin-Madison. Dr Watson has developed and followed interests in general internal medicine (Haematologic, gastrointestinal, urinary, endocrine and musculoskeletal disorders). His research interests lie in clinically relevant problems in veterinary medicine and clinical pharmacology. He is currently an Associate Professor in Veterinary Medicine with special interests in small animal medicine (Especially feline) and therapeutics.

Address: Department of Veterinary Clinical Sciences  
Building B10  
SYDNEY UNIVERSITY  
NSW2006

Telephone: (02) 9351 3437

## *Acknowledgments*

**Expert Panel on Antibiotics, National Health & Medical Research Council**

Provided the stimulus for this publication. The Expert Panel has been most supportive of the project and each member has given freely of their advice and counsel to the Editor, the Authors and the Publisher. It is through the encouragement and support of the Expert Panel on Antibiotics that this publication is able to be presented with so much valuable information.

## *Editorial*

*B S Cooper*

Clinical pharmacology is an essentially practical discipline. It deals with prophylaxis and therapeutics utilising a wide range of drugs in normal and diseased animals. The use of antimicrobial products is governed by the same set of rational rules applying to all other drugs. Based largely on drug concentrations in blood, pharmacokinetic data can be calculated and used to establish a treatment schedule.

To use antibacterial drugs in an effective and safe manner, veterinarians need continuing access to two things; (i) the experience of species specialists expert in their own particular field, and (ii) a brief reminder concerning the underlying principles of drug use. This book seeks to provide those two features side by side, the one complementing the other, because neither stands easily alone and rational drug use demands far more than simply following directions.

The style of presentation should lend itself to easy reference by clinicians and others; hence the extensive index. But it must be emphasised that Antimicrobial Prescribing Guidelines does not pretend to be a textbook and for more detailed information, the reader should refer to appropriate publications.

While every effort has been made to ensure accuracy, mistakes occasionally slip through and for those we apologise. Would you be so kind as to let us know if you have noticed errors or omissions? The Foundation would be grateful to receive your comments and any other suggestions for ways to improve this publication.

## *Introduction*

*Brian S Cooper*

Whenever antimicrobial treatment is instituted, there is an intrusion into the relationship between the host and a multitude of both pathogenic and commensal organisms. Damage to the latter as well as the possibility of a number of more specific treatment should only be used on a known pathogen causing a disease response in the host. Particularly in a compromised host, some ancillary treatment e.g. regulation of electrolyte balance, may be an essential supportive tactic in overcoming the causative infection. Hippocrates's axiom "Above all else, do no harm" is still the key principle in dealing with therapeutics; including antimicrobial chemotherapy.

There is a formidable list of factors capable of jeopardising the success of medication. They may be associated with any three components of the so-called chemotherapeutic triangle; those are the host, the micro-organism and the antimicrobial drug. Once a diagnosis or presumptive diagnosis has been made and an appropriate antibacterial drug has been chosen, the treatment schedule must be designed to achieve an optimum concentration of the drug in contact with the causative micro-organism for the required period. Any number of factors may thwart attempts to achieve even that single goal; for instance, the size of dose, the dosage interval, how the product formulation determines the rate and extent of absorption of the active principle, the extent of drug distribution throughout the host tissues, the host's capability for drug biotransformation and the route(s) of excretion. Binding of the drug by plasma protein or other host components may be important for some classes of chemical, and in certain infectious processes, the host reaction may create barriers only slowly permeable to the drug. In addition the relative sensitivity of any bacteria to a given drug concentration, the status of the host's immune system and non-specific defence mechanisms, as well as the stage of infection at which antibiotics are first employed, may all, singly or in combination, have a substantial bearing on the final outcome of therapy. Therefore, if the safest and most effective results are to be obtained, the principles of chemotherapy must be well understood by the veterinarian, and observed when drawing up a therapeutic plan.