

***Handbook of Animal Models of Infection***

Edited by O Zak & M Sande (1999). Academic Press: London. 1135pp. Hardback. Obtainable from the publishers, 24-28 Oval Rd, London NW1 7DX, UK (ISBN 0127753907). Price £125.00.

The focus of this book is to combine the collected experience of the world's leading investigators in the area of experimental anti-infective chemotherapy. The stated aim of the book is to assist the investigator in planning better experiments and to avoid the mistakes that have already been made by others. The history of the book is that 13 years ago a three volume text was produced which gave details of a series of experimental models evaluating antimicrobial chemotherapy in vivo which has proved to be very useful. This single volume updates this in a '*one volume strategy, a handbook format*'. This is some handbook: it runs to 1135 pages and weighs 3.4kg! It is divided into five parts: general methodology, and experimental bacterial, mycotic, parasitic and viral infections.

The general methodology section (chapters 1–13) points out that animal models were decisive in proving that micro-organisms were the cause rather than the effect of disease. It covers the perceived benefits of using animal models but also covers the problems of using such models and the advantages of in vivo over in vitro testing systems. It covers the importance of experimental planning, the hypothesis, the literature search, the ethical consideration on the use of animals, and the importance of statistical analysis. It stresses to the reader the importance of care and use of laboratory animals, and that the prevention and recognition of illness is important. It refers the reader to further information on care and use within this handbook and encourages discussion with other investigators who would be willing to share their experiences with scientists. Regrettably, it fails to encourage the reader to discuss such problems with their institutional veterinarian whose experience is more likely to be factual than anecdotal. There are useful sections on ethical committees and on ethical considerations on the use of animals, on techniques of refinement to reduce the severity of experiments and on the importance of animal health to good experimental results. This part of the book is well worth reading and encourages the application of the principles of the three R's.

The remaining 118 chapters each cover a different model of infection (bacterial, mycotic, parasitic or viral), with an average of eight pages per model. Each one is clearly set out and covers such procedural details as the species and strain of animal, the particular variant of the infectious agent and its preparation, the methodology of introduction of the agent, the key parameters for monitoring successful infection and the evaluation of the disease process. There is a comprehensive list of references and an outline of the advantages and disadvantages of each model.

Sadly, and in contradiction to the message of the introductory chapters, the majority of the procedural models show no evidence of recent refinement of technique to improve animal welfare. I could find none that mentioned humane end points and no examples of quantitative assessment of welfare using the scoring systems discussed in the general introductory chapters. There is scant mention of analgesics, little evidence of refined husbandry techniques that might alleviate suffering (such as provision of mash or soft bedding) and yet the experimental details are very precise and complete in many other respects. For example, a model of infectious arthritis recommends obtaining blood samples by cutting the distal end of the tail and examination of the animals one to three times per week. The end point is not defined. Many of the experimental models use phrases such as '*dead animals are removed*' or '*mortality is recorded*'. There is a glimmer of hope in the chapter on the rabbit model of

catheter-associated urinary tract infection that advises use of halothane, sterile technique, intravenous fluids and monitoring every 1–4 h. Unfortunately they recommend administration of the halothane by the ‘cat-bag’ technique. The most frequently referred to anaesthesia agents are ether and pentobarbitone, with ketamine and xylazine getting the occasional mention. I found a couple of other models that suggested the use of halothane, but nowhere could I find the use of isoflurane or any modern injectable agent.

The sheer size of the book makes it uncomfortable to read and will confine it to life as a reference text on the library shelf. Those researchers seeking details of one of the 118 specific animal models of infection will open it to find the eight pages of detail they require, and the first chapters on general principles are unlikely to see the light of day very often. Perhaps production as two volumes would have achieved more for refinement: volume one being a slim text on the general principles, a genuine handbook to be dipped into for a little light background reading, and volume two containing all the models that can then stay on the shelf for reference.

It is most unfortunate that the models have not been updated and the principles of the three R’s have not been applied, for there is plenty of scope in this book for refinement and for improving animal welfare which appears to have been missed.

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### ***Companion Animal Death***

M F Stewart (1999). Butterworth-Heinemann: Oxford (in association with the Society for Companion Animal Studies). 192pp. Paperback. Obtainable from the publishers, Linacre House, Jordan Hill, Oxford OX2 8DP, UK (ISBN 0750640766). Price £14.99/US\$30.00.

We forget too readily that the driving motivation which sets most veterinary surgeons on their career path is not scientific detection or technical satisfaction but compassion and empathy for animals and those who depend on them. The price of empathy, of affection, is grief at final separation. This book examines the mixture of pain and fond recollection and aims, most successfully, to help all those who have to cope with it and help others to do the same.

The book begins with general background regarding pet-vet-nurse-owner interactions in the context of everyday practice. It adopts a bullet point format with summaries of key points. It manages, very deftly, to be eminently readable yet readily accessible, almost in lecture note format. Section 2 gives detailed guidance on all aspects of euthanasia: practical, ethical and psychological, while sections 3 and 4 deal with special or challenging situations, with particular attention to guilty or angry clients, those with disabilities, loss of a support dog, clients from different ethnic or cultural backgrounds and an outstanding consideration of the vulnerability and sensitivity of children and adolescents. There is also advice on missing animals and replacement of deceased pets. It is, perhaps, when controversial treatment fails that complementary medicine has its strongest appeal and it therefore receives a short section in this book. Section 5 addresses stress in veterinary practice and section 6 has summary information on a useful range of topics including complaints, which often arise from various aspects of terminal illness. It notably includes veterinary nurses who are upset by veterinary surgeons who seem to regard patients only as clinical cases, not as individual beings. The section on grief in animals mentions briefly but inevitably ‘Greyfriars Bobby’ (now part of