

There is also a section on measuring animal welfare, relating to different indicators of animal welfare, but also bringing up the use of legislation to regulate minimum standards for animal housing and management. The concepts of stress and pain and the animals' physiological responses to these experiences are introduced. The chapter ends with a more general discussion about ways of promoting an improvement in animal welfare; by changing public opinion, by legislation and codes of practice and on financial incentives. In the section on legislation the UK focus becomes apparent, although some references to EU legislation are also made. However, more emphasis on the new EU regulation on the welfare of animals at the time of killing (including slaughter), which was adopted in September 2009, would have been highly relevant in this context — it is only referred to as a 'proposal in 2008'. Neither is the previous EU Directive on animal welfare at slaughter discussed. The chapter on animal welfare is a useful introduction for someone who is not previously familiar with the basic concepts of animal welfare or the main issues related to farm animal welfare. For a book on meat science, however, the section specifically related to animal welfare during marketing and slaughter is remarkably short.

In summary, this book is a well-written introduction to a number of different aspects of meat science, where the emphasis is on meat composition, quality and hygiene, rather than on animal welfare.

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Chronic Pain in Small Animal Medicine

SM Fox (2010). Published by Manson Publishing Ltd, 73 Corringham Road, London NW11 7DL, UK. 160 pp Hardback (ISBN 978-1-84076-124-5). Price £50.00.

This aim of this book is a noble one. One of the most important ethical responsibilities of all veterinary surgeons is the relief of pain. Many available texts deal with the management of acute pain, but effective treatment of chronic pain has received relatively little attention in comparison. Chronic pain is often an unpredictable condition, lasting beyond the time necessary for healing and often resistant to conventional therapy, and the stated aim of the book is to go beyond a simple 'recipe book' approach to treatment. Never before has the subject been covered in a single volume. There are six contributors, all recognised experts in the fields of anaesthesia, surgery and pain management, although the author of each chapter is not made clear.

The book is divided into three sections, with three chapters in each section. Section 1 covers the physiology of pain and pathophysiology of osteoarthritic and cancer pain. Section 2 covers the various drug classes available, whilst Section 3 explores the multimodal management of pain in a variety of disorders. There is also a useful glossary and a very comprehensive list of references for each chapter. A list of abbreviations is also given, but frustratingly some of those used in

the text do not appear on the list. Three case studies are also included, although these relate to orthopaedic pain only and this part could have been considerably enhanced by including management of chronic pain resulting from other disorders, such as nerve injury and cancer.

The first section on the physiology and pathophysiology of pain is well-written, but could have been improved considerably by a chapter on pain assessment. Without proper (and preferably objective) measurement of pain and its associated behaviours, it is impossible to assess efficacy of the various analgesic drugs and their combinations. References are given, but a summary of current knowledge would have been welcome. In addition, it would have been extremely useful, and added significantly to the book's appeal, if a separate chapter on the logistics of establishing a pain clinic in practice had been included.

In the second section, the chapters on non-steroidal anti-inflammatory drugs and nutraceuticals are excellent and give a comprehensive overview of their use and drawbacks. Considering the huge market for NSAIDs (approx \$US150 million in 2009 according to this book), it is absolutely vital that all veterinarians in small animal practice have a sound knowledge of their mechanisms of action, indications and side-effects. It is a pity that robenacoxib is not mentioned, but this is likely a result of the inevitable delay between chapters being written and ultimate publication. Unfortunately, Chapter 4 (covering all other analgesic drugs) is potentially misleading, possibly as a result of over-enthusiastic 'cutting and pasting'. For example, the use of epidural morphine is referred to in the section on intra-articular opioid delivery, and butorphanol is cited as a partial agonist in Table 26, but as a mixed agonist/antagonist in the text. Gabapentin is cited as a 'classic' NMDA antagonist, which is simply not the case (even more confusing because its mode of action under the anti-convulsant subheading is correctly cited as a blocker of the $\alpha 2\delta$ subunit of voltage-gated calcium channels). There are also some irritating spelling errors: carbamazepine is incorrectly written as 'carbamazepine' several times (page 129), and atipamezole as 'antipamezol' (Table 27). These errors should have been spotted either by the copy editor or by the authors in the galley proof stage and are a pity because they give the impression that some chapters have been thrown together rather hastily.

The book is illustrated lavishly throughout, although some of the figures are not labelled particularly well: for example, Figure 7 has nearly twenty abbreviations, many of which are not included in the list of abbreviations at the beginning of the book. Undoubtedly, more detailed figure legends would have enhanced understanding of sometimes difficult concepts. Occasionally, one is left with the impression that some of the figures have been inserted simply to break up the text, eg how does a picture of the molecular structure of lidocaine add to the understanding of its mechanism of action?

Despite the comments above, however, this is a useful book and I believe anyone with an interest in management of pain, and chronic pain in particular, should buy it. A sound understanding of pathophysiology and pharmacology should help a logical, knowledge-based approach to

effective treatment. However, there is still a large disparity between the amount of pathophysiological data on the mechanisms responsible and the subsequent translation of this scientific evidence into clinical practice. The way forward now is to investigate specific, evidence-based pain management protocols to improve the quality of life in

animals suffering from chronic pain. This book provides the necessary groundwork and the reference list alone is immensely useful.

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