Contents

Contributors ix
Preface xiii

Section 1: Introduction and Anatomy, Physiology, and Pathophysiology of Pain 1
1 Introduction: Pain: An Issue of Animal Welfare 3
   Alice Crook
2 Anatomy, Physiology, and Pathophysiology of Pain 9
   Yael Shilo and Peter J. Pascoe
3 Mechanisms of Cancer Pain 29
   Cholaswat Pucharintak and Alvin J. Beitz

Section 2: Pharmacology of Analgesic Drugs 39
4 Opioids 41
   Tanya Duke-Novakovski
5 Nonsteroidal Anti-Inflammatory Drugs and Corticosteroids 69
   Stuart Clark-Price
6 Local Anesthetics 85
   Kip A. Lemke
7 α-2 Adrenoceptor Agonists 93
   Reza Seddighi
8 Nontraditional Analgesic Agents 105
   Lydia Love and Dave Thompson
9 Novel Methods of Analgesic Drug Delivery 115
   Lesley J. Smith
10 Pharmacokinetic Principles for the Design of Intravenous Infusions 125
    Bruno H. Pypendop

Section 3: Nonpharmacological Pain Therapy 131
11 Canine Rehabilitation 133
    Lowri Davies
12 Equine Rehabilitation 147
    Lowri Davies
13 Custom External Coaptation as a Pain Management Tool: Veterinary Orthotics and Prosthetics 155
    Martin W. Kaufmann and Patrice M. Mech
14 Myofascial Pain Syndrome in Dogs 161
    Rick Wall
15 Traditional Chinese Herbal Medicine and Homeopathy in Pain Management 171
    Lynelle Graham, Mona Boudreaux, and Steve Marsden
16 Mechanisms of Acupuncture Analgesia 177
    Shauna Cantwell
## Contents

1. Equine Acupuncture  
   *Arthur I. Ortenburger*  
   Page 183

2. Canine Chiropractic and Pain Management  
   *Robin Downing*  
   Page 189

3. Equine Chiropractic  
   *Henry S. Adair*  
   Page 195

### Section: 4 Management of Pain in Veterinary Species

4. Recognition and Assessment of Acute Pain in the Dog  
   *Kate L. White*  
   Page 201

5. Treatment of Acute Pain in the Dog  
   *Kate L. White*  
   Page 209

6. Recognition and Assessment of Chronic Pain in Dogs  
   *Anna Hielm-Björkman*  
   Page 227

7. Treatment of Chronic Pain in Dogs  
   *Anna Hielm-Björkman*  
   Page 239

8. The Recognition and Assessment of Pain in Cats  
   *Kersti Seksel*  
   Page 269

9. Treatment of Acute Pain in Cats  
   *Jacob A. Johnson*  
   Page 275

10. Treatment and Assessment of Chronic Pain in Cats  
    *Bonnie Wright and Jessica K. Rychel*  
    Page 289

    *Lydia Love and Lisa Dibenedetti*  
    Page 299

12. Recognition and Treatment of Pain in the Small Animal Critical Care Patient  
    *Jane Quandt*  
    Page 311

13. Recognition and Assessment of Pain in Horses  
    *Emma Love*  
    Page 317

14. Treatment of Acute and Chronic Pain in Horses  
    *Bernd Driessen and Laura Zarucco*  
    Page 323

15. Recognition and Assessment of Pain in Ruminants  
    *Kevin J. Stafford*  
    Page 349

16. Treatment of Acute and Chronic Pain in Ruminants  
    *Alexander Valverde*  
    Page 359

17. Recognition and Treatment of Pain in Camelids  
    *Tamara Grubb*  
    Page 373

18. Recognition and Treatment of Pain in Pet Pigs  
    *Kristie Mozdzioch and Valerie V. Tynes*  
    Page 383

19. Recognition and Assessment of Pain in Small Exotic Mammals  
    *Lisa Thompson*  
    Page 391

20. Treatment of Pain in Small Exotic Mammals  
    *Cheryl B. Greenacre*  
    Page 399

21. Recognition and Treatment of Pain in Birds  
    *Karen L. Machin*  
    Page 407

22. Recognition and Treatment of Pain in Reptiles, Amphibians, and Fish  
    *Lydia Pam Posner and Sathya K. Chunnadurai*  
    Page 417
Contents

Section 5: Incorporating Pain Management into Your Practice and Hospice and Palliative Care 425

39 Integrating Pain Management into Veterinary Practice 427
   Robin Downing

40 Pain Management in Hospice and Palliative Care 431
   Keri Jones

Index 437