TABLE OF CONTENTS

Feline Anesthesia and Pain Management

Contributors

1 Handling, Restraint, and Preanesthetic Assessment 1 Graeme Doodnaught and Paulo Steagall
Introduction 1
Handling and Restraint 2
Preanesthetic Assessment 10
Risk Factors, Morbidity, and Mortality 12
Further Reading 14

2 Anatomy, Physiology, and Pharmacology 17

Bradley Simon and Paulo Steagall

Introduction 17

Cardiovascular System 17

Respiratory System 22

Nervous System 25

Urinary System 27

Hepatic System 30

Endocrine System 31

Gastrointestinal System 32

Further Reading 33

3 Sedation and Premedication 35

Paulo Steagall

Introduction 35

Drugs used for Sedation in Cats 36

Acepromazine 36

Benzodiazepines 39 Agonists of α 2 -Adrenergic Receptors 40 Anticholinergics 43 Opioids 44 Ketamine and Alfaxalone 45 Trazodone 45 Other Drugs 45 Further Reading 46

4 Injectable Anesthetics and Induction of Anesthesia 49

Paulo Steagall Introduction 49

General Considerations for Induction of Anesthesia 50

Drugs used for Induction of Anesthesia 51

Propofol 51

Alfaxalone 54

Dissociative Anesthetics (Ketamine and Tiletamine) 55

Barbiturates 57

Etomidate 59

Fentanyl plus Midazolam 60

Induction with Volatile Anesthetics 60

Total Intravenous Anesthesia (TIVA) 61

Infusion Devices 62

Injectable-only Protocols 62

Further Reading 64

5 Local Anesthetics and Loco-regional Techniques 67

Francesco Staffieri and Paulo Steagall

Introduction 67

Physicochemical and Pharmacodynamic Properties of Local Anesthetics 68

Axons and Nerve Fibers 69

Pharmacokinetics 70

Factors Influencing Onset and Duration of Action 70
Metabolism 71
Adjuvants 71
Local Anesthetics 71
Adverse Effects 74
Techniques for Nerve Location 77
Local Anesthetic Techniques 78
Further Reading 85
6 Inhalation and Balanced Anesthesia 89 Bruno Pypendop

Volatile Anesthetics 89 Halothane 90 Isoflurane 90 Sevoflurane 91 Desflurane 91 Balanced Anesthetic Techniques 92 Opioids 93 Ketamine 95 Nitrous Oxide 96 Lidocaine 97 Dexmedetomidine 98 Gabapentin 98 Balanced Anesthesia Summary 99 Breathing Systems 99 Further Reading 103

7 Monitoring 105

Daniel Pang Introduction 105 Clinical Monitoring using Physical Senses ("Hands On") 106 Cardiovascular System 107 **Respiratory System 112**

Further Reading 121

8 Fluid Therapy 123 Peter Pascoe

Introduction 123

Feline Physiology and Pathology with regard to Fluid Therapy 123

Fluids 125

Preoperative Preparation 129

Intraoperative Fluids 132

Postoperative Care 136

Further Reading 137

9 Anesthetic Management of Special Conditions 139

Paulo Steagall Introduction 139 Urethral Obstruction and Uroabdomen 139 Chronic Kidney Disease (CKD) 143

Hyperthyroidism 145

Hypertrophic Cardiomyopathy (HCM) 147

Neuroanesthesia 148

Diaphragmatic Rupture 151

Gastrointestinal Emergencies 153

Idiopathic Hepatic Lipidosis 154

Diabetes Mellitus 155

Other Conditions 156

Further Reading 157

10 Anesthetic Complications 159

Polly Taylor and Sheilah Robertson

Introduction 159

Airway Management 161

Respiratory Insufficiency 167

Circulation 169 Trauma 173 Recovery 174 Body Temperature 176 Cardiopulmonary Resuscitation (CPR) 177 Further Reading 180

11 Mechanisms of Pain 183

Craig B. Johnson Introduction 183 Mechanisms of Modulation in Tissues 183 Mechanisms of Modulation in Peripheral Nerves 186 Mechanisms of Modulation in The Spinal Cord 188 Mechanisms of Modulation in the Brain 189 The Role of Glial Cells (Glia, Neuroglia) and the Immune System 191 Mechanisms of Cancer Pain 192 Diabetic Neuropathy 195 Pruritus (Itch) 196 Further Reading 197

12 Assessment and Recognition of Acute Pain 199

Sheilah Robertson Introduction 199 Pain-assessment Tools 199 Behavior-based Indicators of Pain 206 Intervention Scores 212 Using Response to Treatment as a Diagnostic Tool 212 Confounding Factors 212 Personality, Fear and Stress 213 Using Pain-assessment Tools 216 Continued Assessment at Home 216 Further Reading 217

13 Treatment of Acute (Adaptive) Pain 221 *Paulo Steagall and Polly Taylor*Introduction 221 Challenges in Feline Pain Management 222 Principles of Pain Management 223 Nonpharmacological Therapies in Acute Pain Management 227 Pharmacological Therapy in Acute Pain Management 229 Further Reading 237

14 Assessment and Recognition of Chronic (Maladaptive) Pain 241

Beatriz Monteiro and Duncan Lascelles

Introduction 241

Common Causes of Chronic Pain 244

Clinical Signs 244

Implications for Quality of Life 246

The Concept of Analgesic Challenge 248

Assessing Chronic Pain in Specific Conditions 248

Further Reading 255

15 Treatment of Chronic (Maladaptive) Pain 257

Beatriz Monteiro and Eric Troncy

Introduction 257

Client Communication: A Crucial Component of Treatment for Chronic Painful Conditions 258

Challenges in the Treatment of Chronic Pain in Cats 258

Pharmacological Therapy 261

Opioids 261

Local Anesthetics 261

Nonsteroidal Anti-inflammatory Drugs (NSAIDs) 263

Tramadol 267

Gabapentin 268

Amantadine 270

Emerging Analgesic Modalities 270

Other Analgesics 271

Nonpharmacological Treatment 272

Physical Activity and Weight Control 272

Physical Therapy, Massage, Acupuncture, and Transcutaneous Electrical Nerve Stimulation (TENS) 273

Monitoring for Treatment Efficacy 276

Degenerative Joint Disease (DJD) 276

Further Reading 278

Index 281.