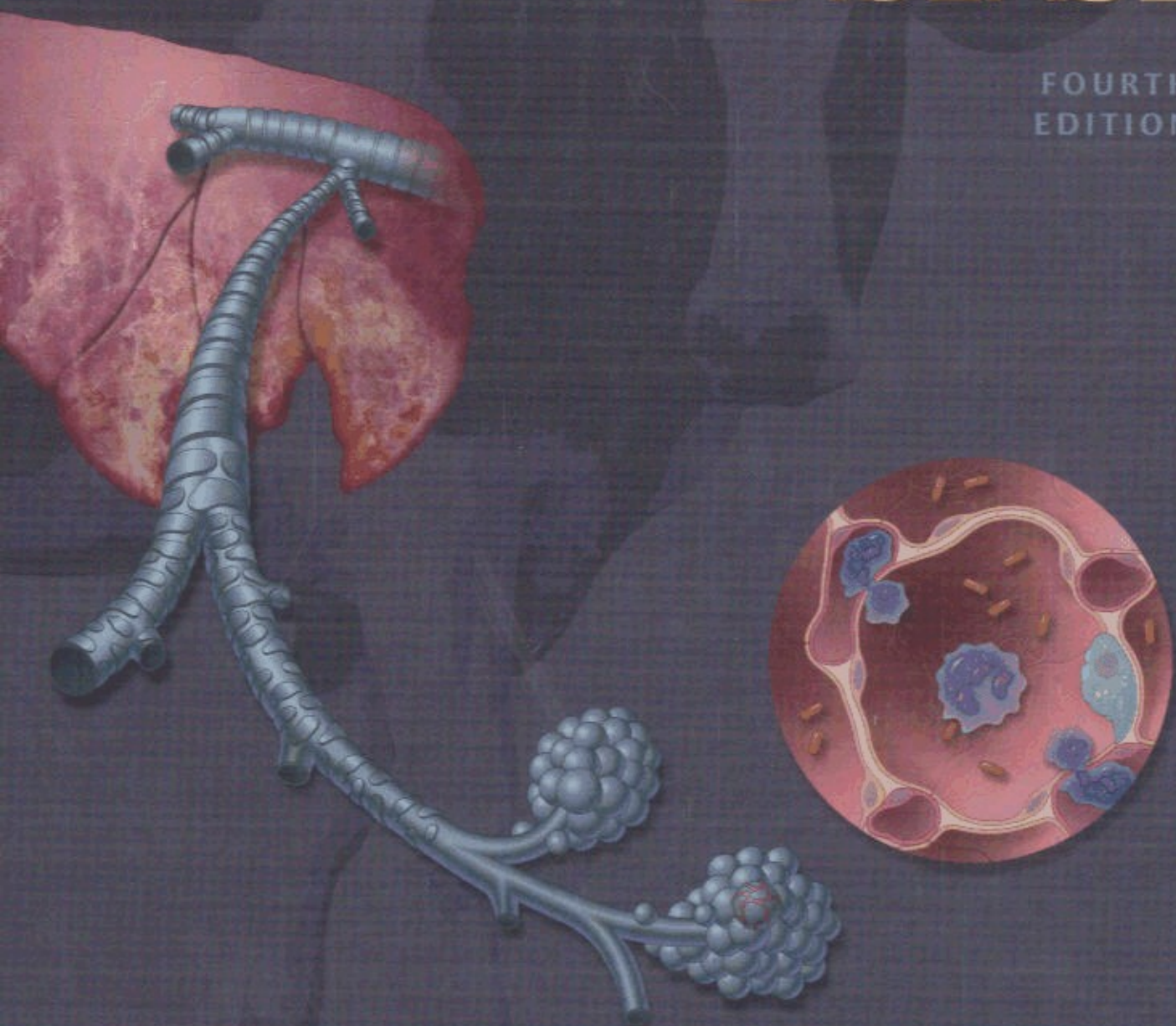


# PATHOLOGIC BASIS *of* VETERINARY DISEASE

FOURTH  
EDITION



M. Donald McGavin • James F. Zachary

MOSBY  
ELSEVIER

# Contents

## SECTION I

### GENERAL PATHOLOGY, 1

#### 1 Cellular and Tissue Responses to Injury, 3

RONALD K. MYERS • M. DONALD McGAVIN

Introduction, 3

Basic Terminology, 3

Types of Diagnosis, 4

Morphologic Changes and How They Are Detected and Evaluated, 4

The Normal Cell, 5

Causes of Cell Injury, 9

Reversible Cell Injury, 12

Irreversible Cell Injury and Cell Death, 16

Chronic Cell Injury and Cell Adaptation, 32

Intracellular Accumulations, 38

Extracellular Accumulations, 44

Pathologic Calcification, 47

Heterotopic Bone (Ectopic Bone), 49

Pigments, 49

Cellular Aging, 59

#### 2 Vascular Disorders and Thrombosis, 63

DEREK A. MOSIER

Introduction, 63

Circulatory System, 63

Microcirculation, Interstitium, and Cells, 65

Fluid Distribution and Homeostasis, 67

Edema (Abnormal Fluid Distribution), 70

Hemostasis, 73

Disorders of Hemostasis: Hemorrhage and Thrombosis, 82

Normal Blood Flow, Distribution, and Perfusion, 91

Alterations in Blood Flow and Perfusion, 92

Shock, 95

#### 3 Acute Inflammation, 101

MARK R. ACKERMANN

Introduction, 101

Beneficial and Harmful Aspects of Inflammation, 103

Overview of the Acute Inflammatory Response, 103

Stimuli Inducing the Acute Inflammatory Response, 106

Fluidic (Exudative) Phase of the Acute Inflammatory Response, 107

Cellular Phase of the Acute Inflammatory Response, 110

Reparative Phase of the Acute Inflammatory Response, 116

Effector Cells of the Acute Inflammatory Response, 117

Chemical Mediators of the Acute Inflammatory Response, 122

Inflammation and the Sensation of Pain, 138

The Effect of Inflammation on the Febrile Response and Other Activities, 138

Unique Types of Inflammation, 138

Morphologic Classification of Exudates in Acute Inflammatory Lesions, 140

Nomenclature of the Inflammatory Response (Morphologic Diagnoses), 143

#### 4 Chronic Inflammation and Wound Healing, 153

MARK R. ACKERMANN

Introduction, 153

Beneficial and Harmful Aspects of Chronic Inflammation, 153

Progression of the Acute Inflammatory Response to Chronic Inflammation, Fibrosis, and Abscess Formation, 155

Mechanisms of Chronic Inflammatory Responses, 157

Gross and Microscopic Lesions and Nomenclature of the Chronic Inflammatory Response, 163

Effector Cells of the Chronic Inflammatory Response, 165

Wound Healing and Angiogenesis, 174

#### 5 Diseases of Immunity, 193

PAUL W. SNYDER

General Features of the Immune System, 193

Innate Immunity (Nonspecific Immunity), 193

Adaptive Immunity (Specific Immunity), 196

Disorders of the Immune System, 208

- 6 Neoplasia and Tumor Biology, 253**  
 DONNA F. KUSEWITT • LAURA J. RUSH  
 Definitions, 253  
 Nomenclature, 253  
 Veterinary Nomenclature, 256  
 Tumor Characteristics, 257  
 Tumor Evolution, 265  
 Tumor Spread, 267  
 Tumor Stroma, 270  
 Tumor Immunity, 274  
 Systemic Effects on the Host, 278  
 Genetics and Cancer, 281  
 Cancer Etiology, 285  
 Molecular Determinants of Cancer, 290  
 Animals and Cancer, 294
- SECTION II**  
**PATHOLOGY OF ORGAN SYSTEMS, 299**
- 7 Alimentary System, 301**  
 HOWARD B. GELBERG  
 Introduction, 301  
 Diseases, 302
- 8 Liver, Biliary System, and Exocrine Pancreas, 393**  
 JOHN M. CULLEN  
 Introduction, 393  
 Diseases of the Liver and Biliary System, 418
- 9 Respiratory System, 463**  
 ALFONSO LÓPEZ  
 Introduction, 463  
 Diseases of the Respiratory System, 473
- 10 Cardiovascular System, 559**  
 JOHN F. VAN VLEET • VICTOR J. FERRANS  
**Heart, 559**  


---

 Introduction, 559  
 Diseases of the Heart, 568  
**Vascular System, 594**  


---

 Introduction, 594  
 Arterial Diseases, 598  
 Venous Diseases, 608  
 Lymph Vessel Diseases, 609
- 11 Urinary System, 613**  
 SHELLEY J. NEWMAN • ANTHONY W. CONFER •  
 ROGER J. PANCIERA  
 Introduction, 613  
 Diseases of the Kidney, 625  
 Diseases of the Lower Urinary System, 680
- 12 Endocrine System, 693**  
 KRISTA M.D. LA PERLE • CHARLES C. CAPEN  
 Introduction, 693  
 Diseases of the Endocrine System, 708
- 13 Bone Marrow, Blood Cells, and Lymphatic System, 743**  
 MICHAEL M. FRY • M. DONALD MCGAVIN  
 Introduction, 743  
 Diseases of the Bone Marrow, Blood Cells, and Lymphatic System, 780
- 14 Nervous System, 833**  
 JAMES F. ZACHARY  
**Central Nervous System, 833**  


---

 Introduction, 833  
 Diseases, 868  
**Peripheral Nervous System, 953**  


---

 Introduction, 953  
 Diseases, 955
- 15 Skeletal Muscle, 973**  
 BETH A. VALENTINE • M. DONALD MCGAVIN  
 Introduction, 973  
 Diseases of Muscle, 996
- 16 Bone and Joints, 1041**  
 STEVEN E. WEISBRODE  
 Introduction, 1041  
 Diseases of Bone, 1064  
 Diseases of the Joints, 1094
- 17 The Integument, 1107**  
 ANN M. HARGIS • PAMELA E. GINN  
 Introduction, 1107  
 Diseases of the Skin, 1158
- 18 Female Reproductive System, 1263**  
 ROBERT A. FOSTER  
 Introduction, 1263  
 Diseases, 1272
- 19 Male Reproductive System, 1317**  
 ROBERT A. FOSTER  
 Introduction, 1317  
 Diseases of the Male Reproductive System, 1321
- 20 Eye, Eyelids, Conjunctiva, and Orbit, 1349**  
 BRIAN P. WILCOCK  
 Introduction, 1349  
 Diseases of the Eye, Eyelid, Conjunctiva, and Orbit, 1374