

Contents

<i>Preface to the Second Edition</i>	xiii	<i>Foreword by Dr Sunita Singh</i>	xxii
<i>Preface to the First Edition</i>	xiv	<i>Foreword by Dr Syed Besina Yasin</i>	xxiii
<i>Foreword by Dr Venkateswaran K Iyer</i>	xv	<i>Foreword by Dr Geeta Pachori</i>	xxiv
<i>Foreword by Dr Nita Khurana</i>	xvi	<i>Foreword by Dr Rajeev Sen</i>	xxv
<i>Foreword by Dr Srivani N</i>	xvii	<i>Foreword by Dr Kuldeep Kumar Kaul</i>	xxvi
<i>Foreword by Dr Hansa Goswami</i>	xviii	<i>Foreword by Dr Subhash Chander Bhardwaj</i>	xxvii
<i>Foreword by Dr Ranjana Solanki</i>	xix	<i>Foreword by Dr Soumitra Biswas</i>	xxviii
<i>Foreword by Dr Reeni Malik</i>	xx	<i>Foreword by Dr Pranita Medhi</i>	xxix
<i>Foreword by Dr Roma Issacs</i>	xxi	<i>Foreword by Dr Naval Kishore Bajaj</i>	xxx

Section I: General Pathology

1. Cellular Pathology and Biology of Aging	3	Hyperemia and Congestion	247
Cell Unit of Life and Introduction to Pathology	4	Hemostasis	251
Cellular Response to Stress and Harmful Stimuli	16	Hemorrhagic Disorders	268
Cellular Adaptations	20	Thrombosis	272
Cell Injury and Cell Death: Overview	34	Embolism	289
Pathophysiology of Cell Injury, Morphologic Patterns and Outcome of Necrosis	45	Infarction	292
Regulated Cell Death (RCD)	68	Shock	297
Apoptosis	80		
Intracellular Accumulation of Substances	96	4. Immunopathology	305
Extracellular Accumulation of Substances	109	Immune System	306
Pathologic Calcification	113	Innate Immune Response	315
Cellular Biology of Aging	116	Adaptive Immune Response	331
		Vaccines and Immunization	376
2. Inflammation and Tissue Repair	127	Immunodeficiency Diseases	380
Inflammation	128	Hypersensitivity Reactions	404
Acute Inflammation	131	Immunologic Tolerance	432
Chronic Inflammation	180	Autoimmune Diseases	440
Tissue Repair	202	Tissue/Organ Transplantation immunology	450
		Amyloidosis	460
3. Hemodynamic Disorders, Thrombosis, Embolism and Shock	239	5. Genetic Disorders	471
Edema and Effusions	239	Human Genome	472

Genetics and Molecular Biology 479
 The Nucleus and DNA Replication 487
 Gene Expression, Transcription,
 Translation and Protein Folding 492
 DNA Damage and Repair Systems 503
 Chromosomal Disorders 511
 Human Gene Structure and Mutations 526
 Mendelian (Monogenic) Disorders (Single-
 Gene Mutation) 536
 Balanced Polymorphism 564
 Polygenic and Multifactorial Disorders 567
 Genetic Polymorphism 568
 Disorders of Sexual Differentiation 570
 Genome Imprinting Disorders 572
 Diagnostic Approach of Genetic Disorders 573

6. Neoplasia

581

Neoplasia: General Considerations 582
 Nomenclature and Classification of Tumors 602

Features used to Distinguish Benign Tumors
 from Malignant Tumors 651
 Normal Processes that Regulate Cells and
 Inhibit Carcinogenesis 662
 Epidemiology of Cancer 675
 Preferential Routes of Metastasis of Tumors 698
 Molecular Basis of Cancer 708
 Carcinogenic Agents: Cellular Interaction and
 Carcinogenesis 779
 Role of Oncogenes and Tumor Suppressor
 Genes in Carcinogenesis 809
 Clinical Oncology 896
 Molecular Diagnostics in Oncology 939

7. Nutritional and Infectious Diseases

963

Nutritional Disorders 964
 Vitamins Deficiency 970
 Bacterial Infections 984
 Viral Infections 1014
 Fungal Diseases 1034
 Parasitic Infestations 1042

Section II: Hematology

8. Red Blood Cell Disorders

1055

Hematopoiesis 1056
 Red Blood Cell, Hemoglobin, Anticoagulants
 and Anemias 1079
 Iron Metabolism and Iron Deficiency
 Anemia 1090
 Megaloblastic Anemia, Folic Acid and
 Vitamin B₁₂ Deficiency 1097
 Red Blood Cells Destruction and Classification
 of Hemolytic Anemia 1108
 Hereditary Spherocytosis, Ovalocytosis and
 Stomatocytosis: RBC Membrane Defects 1115
 Thalassemias 1120
 Sickle Cell Disorders and Other
 Hemoglobinopathies 1129
 Glucose-6-Phosphate Dehydrogenase Deficiency
 and Pyruvate Kinase Deficiency Disorders 1137
 Immune-mediated Hemolytic Anemia 1140
 Paroxysmal Nocturnal Hemoglobinuria 1146
 Red Blood Cell Fragmentation Syndromes 1148
 Diagnostic Approach of Hemolytic Anemia 1150
 Bone Marrow Failure Syndromes 1154

9. White Blood Cell Disorders

1163

Leukopoiesis, Quantitative and Qualitative
 Disorders of Leukocytes 1164
 Leukemias 1179
 Acute Lymphoblastic Leukemia 1193
 Acute Myelogenous Leukemia 1211

Myelodysplastic Syndromes 1238
 Myelodysplastic/Myeloproliferative
 Neoplasms 1249
 Chronic Myeloproliferative Neoplasms 1255
 Chronic Lymphoproliferative Neoplasms 1300
 Multiple Myeloma and Other Monoclonal
 Gammopathies 1313
 Mononuclear Phagocytic System
 Disorders 1339
 Hematopoietic Stem Cell Transplantation 1347

10. Platelet Disorders and Bleeding Diathesis

1355

Hemostasis 1355
 Platelet Disorders 1366
 Quantitative Platelet Disorders 1371
 Qualitative Inherited Platelet Disorders 1375
 Qualitative Acquired Platelet Disorders 1378
 Diagnostic Approach and Treatment of
 Platelet Disorders 1380
 Secondary Thrombocytosis and Essential
 Thrombocythemia 1381
 Bleeding Associated with Vascular Disorders 1383

11. Coagulation Disorders and Diagnostic Approach of Bleeding Diathesis

1387

Blood Coagulation System 1387
 Inherited Coagulation System Disorders 1392
 Acquired Coagulation System Disorders 1403
 Thrombophilia (Hypercoagulable State) 1407
 Bleeding Diathesis: Diagnostic Approach 1410

12. Blood Banking and Transfusion Practices 1421

- ABO and Hh Blood Group Systems 1422
- Rh Blood Group System 1431
- Bombay Phenotype and Para-Bombay Phenotype 1432
- Other Blood Group Systems 1433
- Blood Collection, Processing and Storage 1434
- Blood Transfusion and Blood Component Therapy 1452
- Adverse Blood Transfusion Reactions 1459

- Blood Grouping 1466
- Blood Cross-matching (Compatibility) Test 1470

13. Lymph Node, Spleen and Thymus Gland Disorders 1473

- Disorders of Lymph Node 1474
- Hodgkin's Disease 1488
- Non-Hodgkin's Lymphomas 1500
- Disorders of Spleen 1531
- Disorders of Thymus Gland 1536

*Index**i–xi***Section III: Systemic Pathology and Molecular Diagnostics****14. Cellular–Molecular Diagnostic Techniques in Clinical Practice 1545**

- Frozen/Cryostat Microtomy Techniques 1545
- Electron Microscopy and Polarizing Light Microscopy 1547
- Tissue Fixation, Decalcification, Handling of Surgical Specimens and Histochemical Stains 1550
- Immunohistochemistry Technique 1557
- Immunofluorescence Microscopy 1589
- Chemiluminescence Versus Chemifluorescence Techniques 1590
- Molecular Diagnostics to Analyze Cell Proliferation 1592
- Cytogenetic Analysis 1596
- In situ* Hybridization, Chromogenic *in situ* Hybridization and Fluorescence *in situ* Hybridization 1606
- Enzyme-linked Immunosorbent Assay Technique 1612
- DNA Sequencing Methods 1616
- Tissue Microarray (TMA) Technique 1625
- High-performance Liquid Chromatography 1627
- Hemoglobin Electrophoresis and Gel Electrophoresis Techniques 1632

15. Blood Vessels 1637

- Anatomy and Physiology of Blood Vessels 1637
- Arteriosclerosis: Histologic Variants 1638
- Atherosclerosis 1640
- Aneurysms 1657
- Vasculitis 1663
- Venous System 1671
- Lymphatic System 1673
- Neoplastic Disorders of Blood Vessels 1674
- Hypertension 1683

16. Heart 1695

- The Normal Heart 1695
- Ischemic Heart Disease 1696

- Rheumatic Fever and Rheumatic Heart Disease 1715
- Disorders of Myocardium 1724
- Disorders of Endocardium 1731
- Disorders of Cardiac Valves 1737
- Disorders of Pericardium 1741
- Cardiac Hypertrophy and Heart Failure 1747
- Neoplastic Disorders of Heart 1751
- Congenital Heart Diseases and Blood Vessel Malformations 1752

17. Nasal Cavity, Nasopharynx, Paranasal Sinuses, Ear, Larynx and Neck 1757

- Disorders of Nasal Cavity, Nasopharynx and Paranasal Sinuses 1757
- Disorders of Ear 1766
- Disorders of Larynx 1769
- Disorders of Neck 1772

18. Respiratory System 1777

- Pneumonias and Lung Abscess 1782
- Tuberculosis 1794
- Chronic Obstructive Pulmonary Diseases (COPDs) 1803
- Restrictive Pulmonary Diseases 1814
- Pneumothorax and Atelectasis Lung 1828
- Pulmonary Vascular Disorders 1831
- Neoplastic Disorders of Lung 1837
- Pleural Diseases 1872

19. Oral Cavity, Salivary Glands and Jaw 1879

- Disorders of Oral Cavity 1879
- Disorders of Salivary Glands 1886
- Disorders of Jaw 1898

20. Gastrointestinal Tract and Peritoneum 1907

- Disorders of Esophagus 1911
- Disorders of Stomach 1922
- Disorders of Small Intestine 1945
- Disorders of Large Intestine 1963

Disorders of Appendix	1997		
Disorders of Anus and Perianal Region	1999		
Disorders of Peritoneum	2002		
Gastrointestinal Tract Disorders: Diagnostic Approach	2004		
21. Liver, Gallbladder and Exocrine Pancreas	2009		
Disorders of Liver	2009		
Jaundice and Cholestasis	2024		
Hepatitis	2033		
Bacterial Infections and Parasitic Infestations of Liver	2053		
Liver Cirrhosis and Portal Hypertension	2059		
Metabolic Liver Disorders	2076		
Bile Duct Disorders	2092		
Vascular Disorders of Liver	2095		
Neoplastic Disorders of Liver	2098		
Disorders of Gallbladder	2122		
Disorders of Exocrine Pancreas	2137		
22. Kidney and Ureter	2155		
Renal Embryology, Anatomy and Physiology	2156		
Glomerular Diseases of Kidney	2166		
Tubular Diseases of Kidney	2239		
Tubulointerstitial Diseases of Kidney	2244		
Urolithiasis	2255		
Vascular Diseases of Kidney	2262		
Cystic Diseases of Kidney	2268		
Congenital Anomalies of Kidney	2272		
Neoplastic Disorders of Kidney	2274		
Renal Function Tests	2297		
23. Urinary Bladder and Male Reproductive System	2307		
Disorders of Urinary Bladder	2308		
Disorders of Testes	2322		
Disorders of Prostate Gland	2351		
Disorders of Penis	2363		
24. Female Reproductive System	2371		
Disorders of Vulva	2375		
Disorders of Vagina	2381		
Disorders of Uterine Cervix	2389		
Disorders of Uterine Endometrium	2403		
Disorders of Uterine Myometrium	2421		
Disorders of Fallopian Tubes	2426		
Disorders of Ovaries	2428		
Neoplastic Disorders of Ovary	2431		
Gestational Trophoblastic Neoplastic Disorders and Related Tumor-like Lesions	2468		
Pregnancy Associated Non-Neoplastic Disorders	2475		
25. Mammary Glands	2481		
Female Breasts	2482		
Inflammatory Disorders of Breast	2488		
Fibrocystic Disease of Breast	2490		
Revised 2019 WHO Classification of Breast Tumors	2494		
Male Breasts	2547		
26. Endocrine System: Pancreas, Thyroid, Parathyroid, Adrenal and Pituitary Glands	2549		
Disorders of Endocrine Pancreas	2550		
Disorders of Thyroid Gland	2586		
Disorders of Parathyroid Glands	2625		
Disorders of Adrenal Glands	2631		
Disorders of Pituitary Gland	2641		
27. Bones and Joints	2651		
Disorders of Bones	2652		
Osteomyelitis (Bone Infection)	2653		
Metabolic Bone Diseases	2657		
Bone Tumors	2661		
Disorders of Joints	2723		
28. Soft Tissue Tumors and Skeletal Muscle Non-Neoplastic Disorders	2731		
Soft Tissue Tumors	2732		
Non-Neoplastic Disorders of Skeletal Muscle	2796		
29. Skin	2809		
Skin Histology and Skin Disorders	2809		
Infectious Dermatitis	2817		
Inflammatory Dermatitis	2838		
Non-Neoplastic Melanocytic Disorders and Melanocytic Neoplasms	2845		
Nonmelanocytic Cutaneous Neoplasms	2853		
Miscellaneous Skin Disorders	2877		
30. Nervous System	2883		
Central Nervous System	2883		
Central Nervous System Infections	2887		
Central Nervous System Tumors	2896		
Hypoxia-induced Brain Injury	2933		
Cerebrovascular Disorders	2934		
Head Injury	2938		
Demyelinating Disorders of Nervous System	2940		
Congenital Disorders of Nervous System	2941		
<i>Index</i>			2945