

Contents



Foreword	iii
Preface	v
Acknowledgments	vii
Contributors and Reviewers	ix

Section I General Pathology

Chapter 1 Introduction to Pathology 3–15

Shameem Shariff

- Pathology 3
- Role of a Pathologist 3
- Sections of Pathology and their Diagnostic Roles 4
- History and Evolution of Pathology 7
- Techniques Used in the Study of Pathology 11
- Terms used in Pathology 13

Chapter 2 Cell Injury and Cellular Adaptation 16–37

Shameem Shariff

Cell Injury

- Causes of Cell Injury 16
- Reversible and Irreversible Cell Injury 17
- Intracellular Accumulations 19
- Necrosis and Types of Necrosis 24

- Apoptosis 27
- Calcium and Heterotopic Calcification 31

Cellular Adaptation

- Forms of Adaptation 32
- Cellular Aging 34

Chapter 3 Amyloidosis 38–44

Shameem Shariff

- Introduction 38
- Pathogenesis of Amyloidosis 38
- Complications of Amyloidosis 39
- Types of Amyloidosis 40
- Laboratory Diagnosis of Amyloidosis 40
- Special Stains for Amyloidosis 41
- Organs Involved in Amyloidosis 41

Chapter 4	Inflammation	45–57
	<i>Shameem Shariff</i>	
	<ul style="list-style-type: none"> • Introduction 45 • Types of Inflammation 45 	<ul style="list-style-type: none"> • Chemical Mediators of Inflammation 53
Chapter 5	Healing and Repair	58–68
	<i>Shameem Shariff</i>	
	<ul style="list-style-type: none"> • Introduction 58 • Cell Types and their Capacity to Proliferate 58 	<ul style="list-style-type: none"> • Stem Cells and Regeneration 59 • Wound Healing 59
Chapter 6	Hemodynamic Disorders	69–87
	<i>Shameem Shariff</i>	
	<ul style="list-style-type: none"> • Introduction 69 • Edema 69 • Hyperemia, Congestion and Hemorrhage 73 • Shock 75 	<ul style="list-style-type: none"> • Normal Homeostasis 78 • Thrombosis 81 • Embolism 84 • Ischemia and Infarction 85
Chapter 7	Neoplastic Disorders	88–112
	<i>Shameem Shariff</i>	
	<ul style="list-style-type: none"> • Introduction 88 • Neoplasia 88 • Classification of Tumors 89 • Morphology of Normal Cell and Cancer Cell 92 • Men Syndromes 92 • Common Sites of Occurrence of Some Tumors 92 	<ul style="list-style-type: none"> • In situ Carcinoma 93 • Metastasis 93 • Molecular Basis of Cancer 96 • Cell Signaling 100 • Carcinogenesis 105 • Effects of Cancer on the Body 109 • Cancer Immunology 110
Chapter 8	Diagnostic Cytology	113–118
	<i>Shameem Shariff</i>	
	<ul style="list-style-type: none"> • Introduction 113 • Advantages of Diagnostic Cytology 113 • Applications of Diagnostic Cytology 113 	<ul style="list-style-type: none"> • Exfoliative Cytology 114 • Fine Needle Aspiration Cytology 116
Chapter 9	Immunopathology	119–144
	<i>Shameem Shariff</i>	
	<ul style="list-style-type: none"> • Introduction 119 • Innate Immunity 119 • Adaptive Immunity 120 • Hypersensitivity Reactions 123 • Major Histocompatibility Complex 129 • Transplant Pathology 130 	<ul style="list-style-type: none"> • Autoimmune Disorders 133 • Self-Tolerance 133 • Systemic Lupus Erythematosus 135 • Sjögren's Syndrome 137 • Other Autoimmune Disorders 138 • HIV and AIDS 138

Chapter 10 Infections and Infestations 145–173*Shameem Shariff*

- Introduction 145
- Malaria 145
- Typhoid Fever 151
- Syphilis 153
- Leprosy 155
- Bacillary Dysentery 157
- Amebiasis 157
- Herpes Virus Diseases 158
- Measles 159
- Rabies 159
- Coronavirus Infections 160
- Fungal Infections 162
- Taeniasis and Cysticercosis 164
- Echinococcosis 168
- Filariasis 170

Chapter 11 Genetic and Pediatric Diseases 174–193*Roopa A N*

- Introduction 174
- Genes 174
- Genetic Disorders 176
- Chromosomes and Chromosomal Abnormalities 176
- Autosomal Abnormalities 180
- Sex Chromosomal Abnormalities 182
- Diseases due to Single Gene Defects 185
- Tumor-Like Lesions and Tumors in Infancy and Childhood 188
- Lysosomal Storage Diseases 189

Chapter 12 Environmental and Nutritional Diseases 194–203*Shameem Shariff*

- Introduction 194
- Environmental Pollution 194
- Air Pollution 195
- Radiation Pollution 196
- Global Warming 196
- Tobacco Pollution 197
- Alcohol Toxicity 198
- Genetics and Metabolism 199
- Protein-Energy Malnutrition and Starvation 200
- Obesity 201

Section II Hematology and Clinical Pathology**Chapter 13 Hematology 207–230***Shameem Shariff*

- Introduction 207
- Blood Cells 207
- Anemia 217
- Coagulation Time 227
- Bleeding Time 227
- Collection of Blood 227
- Anticoagulants 228

Chapter 14 Microcytic Anemias 231–238*Shameem Shariff*

- Introduction 231
- Iron Deficiency Anemia 231

Chapter 15 Macrocytic Anemias 239–247*Shameem Shariff*

- Introduction 239
- Megaloblastic Macrocytic Anemias 239
- Nonmegaloblastic Macrocytic Anemias 244

Chapter 16 Hemolytic Anemias 248–261*Shameem Shariff*

- Introduction 248
- Groups of Hemolytic Anemias 248
- Investigations in Hemolytic Anemias 249
- Clinical Features of Hemolytic Anemias 249
- Classification of Hemolytic Anemias 250
- Hereditary Spherocytosis 250
- Thalassemias 251
- Hemoglobin H Disease 253
- Sickle Cell Disease 254
- G6PD Deficiency Anemia 255
- Acquired Hemolytic Anemias 256
- Immuno-hemolytic Anemias 257
- Hemolytic Transfusion Reactions 258
- Drug Induced Hemolysis 258
- Nonimmune Hemolytic Anemias 258

Chapter 17 Aplastic Anemia 262–267*Shameem Shariff*

- Introduction 262
- Pancytopenia 262
- Red Cell Dysplasia 265

Chapter 18 Leukocytic Disorders 268–281*Roopa A N*

- Introduction 268
- Leukopenia 268
- Leukocytosis 269
- Leukemoid Reaction 270
- Malignancies of White Cells 271
- Acute Lymphoblastic Leukemia/Lymphoma 272
- Acute Myeloid Leukemia 273
- Chronic Lymphocytic Leukemia 276
- Chronic Myeloid Leukemia 277

Chapter 19 Lymph Nodes and Spleen 282–303*Shameem Shariff*

- Introduction 282
- Lymphoid Organs 282
- Lymph Nodes 283
- Lymphadenopathy 284
- Malignancies Affecting Lymph Nodes 290
- Spleen 300

Chapter 20 Plasma Cell Dyscrasias 304–309*Shameem Shariff*

- Introduction 304
- Plasma Cell Maturation 304
- Multiple Myeloma 305
- Solitary Plasmacytoma 308
- Plasma Cell Leukemia 308

Chapter 21 Hemorrhagic Disorders 310–320*Amita K*

- Introduction 310
- Normal Hemostasis 310
- Etiological Classification of Bleeding Disorders 311
- Disorders of Vitamin K Deficiency 318

Chapter 22 Blood Banking 321–332*Indrani K*

- Introduction 321
- Blood Groups 321
- Bombay Blood Group 322
- Slide Method of Blood Grouping 322
- Tube Method of Blood Grouping 322
- Blood Components 323
- Infections Transmitted by Blood Transfusion 325
- Transfusion Reactions and Steps in the Investigation of a Transfusion Reaction 327
- Autologous Blood Transfusion 329

Chapter 23 Clinical Pathology of Urine 333–348*Shameem Shariff*

- Introduction 333
- Urine Collection 333
- Physical Examination 334
- Chemical Examination for Abnormal Constituents 336
- Dipstick Tests 342
- Microscopic Examination of Urine 342
- Urinary Findings in Renal Diseases 346

Section III Oral Pathology**Chapter 24 Anatomy of the Oral Cavity 351–356***Shameem Shariff*

- Introduction 351
- Floor of the Mouth and Gingiva 351
- Hard Palate and Upper Alveolar Ridge 352
- Pharynx 352

Chapter 25 Development and Anomalies of Oral Structures 357–366*Salahuddin (Sr.), Saif Salahuddin*

- Introduction 357
- Development of Teeth 357
- Microdontia 359
- Macrodontia 359
- Germination 360
- Fused Teeth 360
- Concrecence 360
- Dilaceration of Teeth 360
- Development of the Tongue 361
- Development of Lips 362
- Other Developmental Abnormalities of Oral and Para Oral Structures 364

Chapter 26 Oral Clinical Conditions 367–376*Shameem Shariff, Saif Salahuddin*

- Introduction 367
- Oral Bleeding 367
- Microscopy of Oral Fibrous Hyperplastic Lesions 368
- Glossitis 368
- Hairy Tongue 369
- Scurvy 369
- Lichenoid Reactions 370
- Smoker's Palate 370
- Extravasation Mucocele 370
- Necrotizing Sialometaplasia 371
- Facial Hemiatrophy 371
- Pyogenic Granuloma 371
- Dermatologic Disorders 371
- Oral and Labial Lesions 373
- Viral Infections of the Oral Cavity 373
- Fungal Infections of the Oral Cavity 374
- Severe Congenital Neutropenias 375

Chapter 27 Periodontitis, Dental Caries and Pulpitis 377–382*Saif Salahuddin, Salahudin (Sr.)*

- Introduction 377
- Periodontitis 377
- Dental Caries 378
- Pulpitis 380
- Complications of Infections in the Teeth 381

Chapter 28 Oral Manifestations in AIDS 383–386*Shameem Shariff, Saif Salahuddin*

- Introduction 383
- Oral Infections in HIV 383
- Neoplasms in HIV 385
- Immune Deficiency 385

Chapter 29 Cysts of the Oral Cavity 387–391*Shameem Shariff, Saif Salahuddin*

- Introduction 387
- Classification of Oral Cysts 387
- Radicular Cyst 387
- Dentigerous Cyst 388
- Odontogenic Keratocyst 389

Chapter 30 Oral Lymphoid Lesions 392–394*Shameem Shariff*

- Introduction 392
- Developmental Disturbances of Oral Lymphoid Tissue 392
- Reactive Lymphoid Aggregates 392
- Hamartomas 392
- Other Oral Lymphoid Lesions 393

Chapter 31 Salivary Glands 395–415*Shameem Shariff*

- Introduction 395
- Anatomy of Salivary Glands 395
- Types of Salivary Glands 395
- Gross Pearls of Salivary Gland Lesions 396
- Microscopic Pearls for Diagnosis 397
- Synoptic Histopathology Reporting and Minimum Data Sets 412

Chapter 32 Oral Lesions and Systemic Diseases 416–419*Shameem Shariff, Saif Salahuddin*

- Introduction 416
- Oral Lesions that Signal Systemic Disease 416
- Systemic Diseases with Oral Manifestations 417

Chapter 33 Preneoplastic Lesions of the Oral Cavity 420–424*Shameem Shariff*

- Introduction 420
- Premalignant Lesions and Conditions of the Oral Cavity 420
- Intraepithelial Proliferative Lesions 421
- Oral Lichen Planus 422

Chapter 34 Neoplasms of the Oral Cavity 425–439*Shameem Shariff, Saif Salahuddin*

- Introduction 425
- WHO Classification (2022): Oral versus Oropharyngeal Tumors 425
- Neoplastic Conditions 426
- Malignant Tumors 430
- Minimum Data Sets Reporting 432
- Hard Palate and Upper Alveolar Ridge 437

Section IV Systemic Pathology**Chapter 35 Cardiovascular Diseases and Disorders 443–470***Shameem Shariff*

- Introduction 443
- Arteriosclerosis 443
- Pathogenesis and Pathology of Atherosclerosis 444
- Hypertension 449
- Ischemic Heart Disease 449
- Aneurysms 453
- Heart Failure 457
- Rheumatic Fever 460
- Chronic Valvular Disease 462
- Bacterial Endocarditis 462
- Libman-Sacks Endocarditis 464
- Nonbacterial Thrombotic Endocarditis 464
- Pericarditis and Pericardial Effusion 466
- Cardiomyopathies 467

Chapter 36 Gastrointestinal Tract 471–492*Shameem Shariff*

- Introduction 471
- Esophagus 471
- Stomach 475
- Various Forms of Gastritis 476
- Small and Large Intestine 482
- Tumors of the Small Intestine and Ampulla 484
- Carcinoma of the Colon and Rectum 488

Chapter 37 Respiratory System**493–510***Hasrat Mohammadi*

- Introduction 493
- Pathology of the Maxillary Sinus 493
- Pneumonias 495
- Lung Abscess 497
- Acute Respiratory Distress Syndrome 498
- Emphysema 499
- Bronchiectasis 501
- Tuberculosis 501
- Lung Carcinoma 504
- Secondary Tumors (Metastatic Tumors) 505
- Mesothelioma 507

Chapter 38 Urinary System**511–528***Shameem Shariff*

- Introduction 511
- Anatomy of the Kidneys 511
- Classification of Glomerular Diseases 514
- Clinical Syndromes Associated with Glomerular Diseases 515
- Pathogenesis of Glomerulonephritis 516
- Acute Postinfectious Glomerulonephritis 517
- Systemic Lupus Glomerulonephritis 519
- Diabetic Nephropathy 521
- Hypertensive Renal Disease 522
- Pyelonephritis 523
- Hydronephrosis 524
- Acute Renal Failure 525
- Chronic Renal Disease and Renal Failure 526
- End-Stage Renal Disease and Small Contracted Kidney 527

Chapter 39 Diabetes Mellitus**529–540***Amita K*

- Introduction 529
- Epidemiology 529
- Diagnosis 530
- Classification of Diabetes Mellitus 530
- Type 1 Diabetes Mellitus 532
- Type 2 Diabetes Mellitus 533
- Gestational Diabetes 539
- Diabetes and Oral Hygiene 539

Chapter 40 Hepatobiliary System**541–565***Shameem Shariff*

- Introduction 541
- Bilirubin Metabolism 541
- Jaundice 543
- Hereditary Hyperbilirubinemia 543
- Hepatic Failure 545
- Viral Hepatitis 546
- Toxic Hepatitis 552
- Alcoholic Liver Disease 554
- Nonalcoholic Steatohepatitis 555
- Cirrhosis 557
- Portal Hypertension 558
- Gallbladder 561
- Hepatic Neoplasms 563

Chapter 41 Bone and Soft Tissue 566–591*Bharat Rekhi*

- Introduction 566
- Types of Bone Tissue in the Body 566
- Defects due to Abnormal Resorption of Bone 567
- Bone Tumors 569
- Paget's Disease of the Bone 578
- Soft Tissue 580
- Fibrous Tissue 583
- Smooth Muscle Tumors 585
- Skeletal Muscle Tumors 585
- Vascular—Intermediate Grade 586
- Peripheral Nerve Sheath Tumors 586
- Tumors of Uncertain Histogenesis—Malignant 587
- Grading of Soft Tissue Sarcomas 587
- Imaging in Soft Tissue Tumors 587
- Rheumatoid Arthritis 588

Chapter 42 Skin 592–604*Shruthi NS*

- Introduction 592
- Normal Histology of Skin 592
- Important Terminologies in Skin Pathology 593
- Common Tumors of the Skin 594
- Nerve Sheath Tumors 601

Chapter 43 Eye 605–609*Shashikala P*

- Introduction 605
- Retinoblastoma 605

Chapter 44 Male and Female Sex Hormones 610–614*Shameem Shariff*

- Introduction 610
- Male Sex Hormones 610
- Spermatogenesis 611
- Female Sex Hormones 612
- Stages of Normal Menstrual Cycle 612

Chapter 45 Endocrines 615–633*Raja Parthiban*

- Introduction 615
- Pituitary Gland 615
- Disorders of Anterior Pituitary 616
- Disorders of Posterior Pituitary 618
- Thyroid Gland 619
- Disorders of Thyroid Gland 619
- Thyroid Neoplasms 623
- Parathyroid Glands 624
- Disorders of Parathyroid Glands 625
- Adrenal Gland 627
- Disorders of the Adrenal Gland 627

Section V Instruments and Photomicrographs

Chapter 46 Instruments 637–651

Shameem Shariff

- Lumbar Puncture Needle 637
- Vim-Silverman’s Needle (Liver Biopsy Needle) 640
- Sahli’s Hemoglobinometer 641
- Pipettes for RBC, WBC and Platelet Counts 642
- Bone Marrow Biopsy Needle 645
- Wintrobe’s Tube or Hematocrit Tube 647
- Westergren’s Pipette 648
- Vacutainer Tubes 649
- Blood Collection and Storage 649
- Urinometer 650

Chapter 47 Basic Histopathology 652–662

Shameem Shariff

- Introduction 652
- Fatty Change of the Liver 652
- Caseous Necrosis of Granulomatous Inflammation 653
- Acute Appendicitis 653
- Granulation Tissue 653
- TB Lymph Node 654
- Actinomycosis Colony 654
- Chronic Venous Congestion Lung 654
- Lipoma 655
- Capillary and Cavernous Hemangioma 655
- Squamous Cell Carcinoma 656
- Basal Cell Carcinoma 656
- Malignant Melanoma 656
- Adenocarcinoma of the Colon 657
- Pleomorphic Adenoma 657
- Warthin’s Tumor 657
- Chondroma 658
- Osteoid Osteoma 658
- Osteogenic Sarcoma 658
- Ewing’s Sarcoma Bone 659
- Osteoclastoma 659
- Multinodular Goiter 659
- Hashimoto’s Thyroiditis 660
- Papillary Thyroid Carcinoma 660
- Peripheral Smears 660

Further Readings 663–666

Index 667–692