Contents

CHAPTER 1: Introduction to Fractures and Dislocations 1

- **Fractures 1**
  Definition **1;** *Types of Fracture* **1;** *Deforming Forces* **4;** *Specific Types of Fracture* **4;**
  Signs and Symptoms of a Fracture **5;** *Healing of a Fracture* **5;**
  Factors Influencing Healing (Predisposing Factors for Delayed Union and Nonunion) **6;**
  Management of a Fracture **6;** *Basic Methods of Treating a Fracture* **7;** *Complications* **7;**
  Treatment of Delayed and Nonunions **9;** *Recent Concept of Fracture Healing* **14**
- **Dislocations 15**
  Definition of Dislocation and Subluxation **15;** *Types of Dislocation* **15;** *Traumatic Dislocation* **15;**
  Pathological Dislocation **17;** *Paralytic Dislocation* **17**

CHAPTER 2: Fractures in the Upper Limb 18

- **Fractures Around the Wrist 18**
  Bennett's Fracture **18;** *Rolando's Fracture* **19;** *Scaphoid Fracture* **20;** *Colles' Fracture* **25;**
  Smith's Fracture **29;** *Barton's Fracture* **30;** *Essex-Lopresti Fracture* **31;** *Chauffeur's Fracture* **32**
- **Fractures in the Forearm 33**
  Fracture of the Radius and the Ulna **33;** *Monteggia Fracture* **34;** *Galeazzi Fracture* **36**
- **Fractures Around the Elbow 37**
  Radial Head Fracture **38;** *Olecranon Fracture* **39;** *Capitulum and Trochlea Fractures* **40;**
  Medial and Lateral Epicondyle Fractures **40;** *Medial and Lateral Condyle Fractures* **41;**
  Supracondylar Fracture of the Humerus **42;** *Intercondylar Fracture* **50**
- **Fractures in the Arm and Around the Shoulder 51**
  Fracture Shaft of the Humerus **51;** *Fractures of the Proximal Humerus* **53;** *Fracture of the Clavicle* **54;**
  Fractures of the Scapula **56**

CHAPTER 3: Ligament Injuries and Fractures in the Lower Limb 60

- **Fractures of the Foot 60**
  Chopart's Injury **61;** *Lisfranc's Injury* **61;** *Fracture of the Fifth Metatarsal Bone* **63;** *Jones' Fracture* **63;**
  Pseudo-Jones' Fracture **64;** *Fracture of the Talus* **64;** *Calcaneus Fracture* **67**

- **Injuries Around the Ankle 71**
  Ligament Injuries **71;** *Bony Injuries of the Ankle (Pott's Fracture)* **71;**
  The Surgical Sequence of Reconstruction Followed in Vertical Compression Injury **77**
- **Tibial Diaphyseal Fractures 77**
- **Injuries Around the Knee Joint 79**
  Ligament Injuries **79;** *Meniscal Injuries* **82;** *Fracture of the Patella* **85;**
  Fractures of the Tibial Condyle (Tibial Plateau) **88;** *Fractures of the Femoral Condyles* **89**
- **Fracture of the Shaft of the Femur 91**
  Complications **92**
- **Fractures Around the Hip 92**
  Fracture of the Neck of the Femur **92;** *Intertrochanteric Fracture* **99;** *Subtrochanteric Fracture* **102**

CHAPTER 4: Dislocations 107

- **Dislocation of the Acromioclavicular Joint 107**
  Mechanism of Injury **107;** *Classification* **107;** *Clinical Features* **108;** *Diagnosis* **108;**
  Management **108**
- **Dislocation of the Shoulder 109**
  Types **109;** *Anterior Dislocation of the Shoulder* **109;** *Recurrent Anterior Dislocation* **110;**
  Posterior Dislocation of the Shoulder **111;** *Recurrent Posterior Dislocation* **112**
- **Dislocation of the Elbow 112**
  Types **112;** *Mechanism of Injury* **112;** *Diagnosis* **112;** *Management* **113**
- **Dislocation of the Hip Joint 114**
  Types **114;** *Mechanism of Injury* **114;** *Classification of Posterior Dislocation* **116;**
  Diagnosis **116;** *Management* **116;** *Complications* **118**
- **Dislocation of the Knee 118**
  Diagnosis **119;** *Treatment* **119**

CHAPTER 5: Fractures of the Pelvis 120

- **Formation of Pelvis 120**
  Mechanisms of Injury **121;** *Classifications* **122;** *Clinical Signs of Importance* **123;**
  Investigations **124;** *Principles of Management* **124;** *Complications of Fracture Pelvis* **125**
- **Malgaigne Fracture 125**

CHAPTER 6: Spinal Injuries 127

Structure of the Spinal Column **127;** *Structures that Impart Stability to the Spinal Column* **127;**
Functions of the Spinal Column **128;**

- **Spinal Injury 128**
  Denis' Three Column Concept **129;** *Mechanisms of Spinal Injuries* **129;**
  Specific Types of Spinal Column Injury **131;** *Spinal Cord Injury* **133;** *Management of Spinal Injuries* **134;**
  Management of Established Paralysis (Quadriplegia and Paraplegia) **136;** *Signs of Grave Prognosis* **137;**
  Perianal Anesthesia **137;** *Bulbocavernous Reflex* **137;** *Anal Wink* **137;** *Rehabilitation* **138;**
  A Ray of Hope for Paraplegics and Quadriplegics **138**

CHAPTER 7: Peripheral Nerve and Brachial Plexus Injuries 140

- **Peripheral Nerve Injury 140**
- **Structure of a Peripheral Nerve 140**
- **Response of a Neuron to Injury 140**
- **Classification of Nerve Injury 142**
  Based on Seddon's Classification (1943) **142;** *Based on Sunderland Classification (1951)* **142**
- **Diagnosis 142**
  Autonomic and Sensory Changes **142;** *Motor Changes* **142;** *Special Tests* **144;**
  Sensory Zones of a Peripheral Nerve **144;** *Diagnostic Tests* **144**
- **Management 145**
  Neuropraxia and Axonotmesis **145;** *Neurotmesis* **145;**
  Reconstructive Procedures in Cases of Absent Recovery **147;** *Management* **152;**
  Pathomechanics of Various Deformities and Signs **152**
- **Brachial Plexus 159**
- **Formation of Brachial Plexus 159**
- **Injuries of Brachial Plexus 160**
  Upper Plexus Injury—Erb's Paralysis **161;** *Lower Plexus Injury—Klumpke's Paralysis* **161;**
  Whole Plexus Injury **161;** *Management* **162**

CHAPTER 8: Bone and Joint Infections 165

- **Introduction 165**
  Osteomyelitis **165**
- **Nonspecific Infection 166**
  Acute Hematogenous Osteomyelitis **166;** *Chronic Osteomyelitis* **169;** *Subacute Osteomyelitis* **171;**
  Brodie's Abscess **171;** *Sclerosing Osteomyelitis of Garre* **172;** *Acute Suppurative Arthritis* **172;**
  Tom Smith's Arthritis of Infancy **173**
- **Specific Infections 174**
  Tuberculosis of Bones and Joints **174;** *Tuberculosis of the Spine* **175;** *Types of Kyphus/Gibbus* **176;**
  Cold Abscess **176;** *Pott's Paraplegia* **179;** *Tuberculosis of the Hip* **181;** *Tuberculosis of the Knee* **184;**
  Tuberculosis of the Ankle and Foot **186;** *Tuberculosis of the Shoulder and Elbow* **186;**
  Tuberculosis of the Wrist **186;** *Spina Ventosa (Tuberculous Dactylitis)* **187;**
  Mycotic Infections of the Bone **187;** *Maduromycosis* **187;** *Syphilitic Infection of the Bone* **188;**
  Parasitic Infestation of the Bone **188;** *Hydatid Cysts in the Bone* **188**

CHAPTER 9: Bone Tumors 190

- **Evaluation of a Bone Tumor 190**
  Clinical Evaluation **190;** *Radiological Evaluation* **192;** *Role of Angiography* **192;** *Bone Biopsy* **193;**
  Laboratory Investigations **194;** *Management* **194**
- **Common Benign Bone Tumors 195**
  Osteoid Osteoma **195;** *Benign Osteoblastoma* **195;** *Osteochondroma* **196;** *Chondroblastoma* **197;**
  Chondromyxoid Fibroma **198;** *Enchondroma* **198;** *Aneurysmal Bone Cyst (ABC)* **199;**
  Unicameral Bone Cyst (UBC) **200**

- **Common Malignant Bone Tumors 201**
  Giant Cell Tumor (GCT) **201;** *Osteosarcoma* **203;** *Chondrosarcoma* **206;** *Ewing's Tumor* **206;** *Myeloma* **207**
- **Metastatic Bone Disease 209**

CHAPTER 10: Slipped Capital Femoral Epiphysis, Perthes' Disease and Other Osteochondritis 211

- **Slipped Capital Femoral Epiphysis (SCFE) 211**
  Predisposing Factors **211;** *Pathology of the Slip* **212;** *Clinical Features* **212;** *Investigations* **213;** *Radiological Classification of the Slip* **213;** *Treatment* **213**
- **Legg-Calve-Perthes' Disease 216**
  Predisposing Factors **216;** *Pathology* **217;** *Radiological Features* **217;** *Clinical Features* **218;** *Head at Risk Signs* **219;** *Investigations* **220;** *Treatment* **220;** *Prognostic Factors* **222**
- **Idiopathic Avascular Necrosis/Osteochondritis 223**
  Kienbock's Disease **223;** *Kohler's Disease* **224**

CHAPTER 11: Intervertebral Disc Prolapse 227

- **Introduction 227**
  Pathomechanics of Intervertebral Disc Prolapse **227**
- **Diagnosis 228**
  Investigations **231;** *Treatment* **233**

CHAPTER 12: Nutritional, Endocrine, Degenerative and Autoimmune Disorders 235

- **Rickets and Osteomalacia 235**
  Rickets **236;** *Pathology* **237;** *Clinical Features* **237;** *Investigations* **238;** *Treatment* **239**
- **Osteoporosis 241**
  Types **241;** *Risk Factors* **241;** *Pathology* **241;** *Clinical Features* **241;** *Investigations* **241;** *Treatment* **242**
- **Osteoarthritis 242**
  Types **242;** *Etiology and Pathogenesis* **243;** *Pathology* **243;** *Clinical Features* **243;** *Diagnosis* **243;** *Management* **244**
- **Rheumatoid Arthritis 245**
  Definition **245;** *Etiology* **245;** *Joints, Organs and Tissues Involved* **245;** *Pathology* **245;** *Clinical Features* **245;** *Investigations* **245;** *Treatment* **246**
- **Hyperparathyroidism 247**
  Classification **247;** *Pathology* **247;** *Laboratory Investigations* **248;** *Treatment* **248**

CHAPTER 13: Congenital and Developmental Anomalies 250

- **Congenital Talipes Equinovarus 250**
  Etiology and Pathogenesis **250;** *Deformities in Clubfoot* **250;** *Diagnosis* **251;** *Treatment* **252**
- **Congenital Vertical Talus 256**
  Synonyms **256;** *Definition* **256;** *Etiology* **256;** *Pathological Anatomy* **256;** *Diagnosis* **256;** *Differential Diagnosis* **256**
- **Developmental Dysplasia of the Hip (DDH) 258**
  Predisposing Factors **259;** *Clinical Features* **259;** *Investigations* **262;** *Treatment* **263**
- **Skeletal Dysplasia and Other Conditions 264**
  Skeletal Dysplasias **264**
- **Important Skeletal Dysplasias 265**
  Spondyloepiphyseal Dysplasia **265;** *Multiple Epiphyseal Dysplasia* **265;** *Achondroplasia* **265;** *Hypochondroplasia* **266;** *Osteopetrosis* **266;** *Paget's Disease* **267;** *Fibrous Dysplasia* **268;** *Osteogenesis Imperfecta* **269**

CHAPTER 14: Miscellaneous Conditions 272

- **Mallet Finger 272**
  Etiology **272;** *Clinical Features* **272;** *Treatment* **272**
- **Boutonniere Deformity 272**
  Etiology **272;** *Clinical Features* **273;** *Treatment* **273**
- **Trigger Finger/Thumb 273**
  Etiology **273;** *Clinical Features* **274;** *Treatment* **274**
- **de Quervain's Disease 274**
  Clinical Features **274;** *Treatment* **274**
- **Dupuytren's Contracture 274**
  Etiology **275;** *Clinical Features* **275;** *Treatment* **275**
- **Carpal Tunnel Syndrome 275**
  Etiology **275;** *Clinical Features* **275;** *Treatment* **275**
- **Tennis Elbow 276**
  Pathology **276;** *Clinical Features* **276;** *Test* **277;** *Treatment* **277**
- **Golfer's Elbow 277**
  Test **277;** *Treatment* **277**
- **Supraspinatus Tendinitis 278**
  Treatment **278;** *Calcific Tendinitis* **278;** *Clinical Features* **278;** *Treatment* **278**
- **Subacromial Bursitis 278**
  Etiology **278;** *Clinical Features* **279;** *Treatment* **279**
- **Painful Arc Syndome 279**
  Etiology **279;** *Clinical Features* **279;** *Treatment* **279**

- **Periarthritis Shoulder 279**
  Clinical Features **279;** *Treatment* **280**
- **Calcaneal Spur 280**
  Etiology **280;** *Clinical Features* **280;** *Treatment* **280**
- **Ganglion 280**
  Treatment **281**
- **Baker's Cyst 281**
  Treatment **281**
- **Neuropathic Joint 282**
  Etiology **282;** *Pathology* **282;** *Clinical Features* **282;** *Diagnosis* **282;** *Treatment* **283**
- **Congenital Torticollis or Wry Neck 283**
  Natural Course of the Fibromatosis **283;** *Clinical Features* **283;** *Diagnosis* **283;** *Treatment* **283;** *Prognosis* **283**
- **Idiopathic Avascular Necrosis of the Head of the Femur 283**
  Other Names **283;** *Clinical Features* **283;** *Staging: Ficat and Arlet (1980)* **284;** *Radiological Features of AVN* **284;** *Treatment* **284**
- **Spondylolisthesis 284**
  Types: Based on Wiltse Classification **284;** *Etiopathogenesis* **284;** *Clinical Features* **285;** *Diagnosis* **285;** *Treatment* **285**
- **Bursa and Bursitis 286**
- **Myositis Ossificans 286**
  Predisposing Factor **287;** *Pathophysiology* **287;** *Treatment* **287**

CHAPTER 15: Fractures in Children 288

- **Types of Injuries 288**
  Physeal Injuries **288;** *Thurston Holland Sign (Shiny Corner Sign)* **289;** *Plastic Deformation* **291;** *Buckle Fractures* **291;** *Greenstick Fractures* **292**
- **Common Fractures in the Lower Limb: Diagnosis and Management 292**
  Fracture of Shaft of Femur in Children **292;** *Fracture of Neck of Femur in Children* **293**

CHAPTER 16: Poliomyelitis 295

- **General Information 295**
- **Epidemiology 295**
- **Pathogenesis 295**
  Stages of Poliomyelitis **296;** *Differential Diagnosis* **296;** *Laboratory Diagnosis of Poliomyelitis* **296;** *Treatment of Poliomyelitis* **296**
- **Immunization and its Current Status 297**

- **Skeletal Deformities in Poliomyelitis 297**
  Pathogenesis of Deformities **297;** *Preoperative Considerations* **298;** *Design of Surgical Procedures* **298**
- **Deformities Around the Hip 298**
  Role of Iliotibial Band in Contractures **299;** *Paralytic Dislocation of the Hip* **299;**
  Surgical Procedures for Release of Contractures **299;**
  Surgical Procedures for Paralytic Dislocation of the Hip **299**
- **Deformities of Foot and Ankle 300**
  Tendon Transfers and Corrective Procedures for Muscle Insufficiency **300;**
  Bony Procedures for Deformity Correction **301;** *Triple Arthrodesis* **301;**
  Other Bony Procedures **301;** *Claw Toes* **302;** *Correction of Claw Toes* **302**

CHAPTER 17: Cerebral Palsy 303

- **Etiology 303**
  Prenatal Causes **303;** *Natal Causes* **303;** *Postnatal Causes* **303**
- **Terminologies Used in the Assessment of Limb Involvement 303**
  Monoplegia **303;** *Hemiplegia* **304;** *Paraplegia* **304;** *Triplegia* **304;** *Quadriplegia* **304;**
  Whole Body Involvement **304**
- **Clinical Evaluation of a Child with Cerebral Palsy 304**
  Signs of Prognosis **304**
- **Treatment 305**
  Role of Surgery **306;** *Procedures* **306**

CHAPTER 18: Gait 307

- **Definition 307**
- **Phases 307**
- **Gait Cycle 307**
  Common Terminologies Used in the Analysis of Gait **307**
- **Abnormal Gaits 308**
  Due to Muscle Weakness, e.g. Poliomyelitis **308;**
  Due to Changes in the Bones and Joints **308;**
  Due to Abnormalities in the Nervous System **309**
- **Trendelenburg Gait 309**
  Pathomechanics of Trendelenburg Gait **310**

CHAPTER 19: Amputations 311

- **Definition 311**
- **Indications 311**

- **Types of Amputations 311**
  General Amputations **311;** *Specific Amputations* **311**
- **An Ideal Stump of Amputation 313**
  Recommended Ideal Length of the Stump **313**

CHAPTER 20: Arthroscopy and Total Joint Arthroplasty 315

- **Arthroscopy 315**
  Evolution of Arthroscopes **315;** *Components of an Arthroscope* **315;** *Technique* **315;**
  Advantages of Arthroscopic Procedures **316;** *Limitations of the Arthroscopic Procedures* **316;**
  Complications **316;** *Common Arthroscopic Procedures* **316**
- **Total Joint Replacement (Arthroplasty) 316**
  Evolution **317;** *Complications* **317;**
  Postoperative Rehabilitation after Joint Replacement Surgery **317**

CHAPTER 21: Implants and Instruments 318

- **Introduction 318**
  Materials Used for Orthopedic Implants **318;** *Desirable Properties of an Implant* **318;**
  Types of Implants **318;** *Types of Prosthesis* **319;** *Implant Selection* **319;** *Implant Insertion* **320;**
  Asepsis in the Operating Room **320**
- **Surface Implants 320**
  Screws **320;** *Plates* **321**
- **Intramedullary Implants 323**
  Rigid Nails **323;** *Hollow Nails* **324;** *Elastic Nails* **324**
- **Biodegradable Implants 325**
  Dynamic Hip Screw and a Barrel Plate **325;** *Jewett Nail* **325;**
  Cannulated Cancellous Hip Screw **325**
- **General Instruments Used in Orthopedics 326**
  Mallet **326;** *Chisel* **327;** *Osteotome* **327;** *Bone Gouge* **327;** *William Arbuthnot Lane* **328;**
  William Ferguson **328**
- **Designs of Limb Lengthening Apparatus 328**
  Ilizarov Fixator **328;** *Orthofix Type* **328;** *Wagner Type* **328**

Index *331*