

# Contents

Preface xxi

Preface to the First Edition xxiii

## SECTION I TRAUMA

- 1 Volar Plating of Distal Radius Fractures 1  
**John J. Fernandez and Philipp N. Streubel**
- 2 Open Reduction and Internal Fixation of Scaphoid Fractures 14  
**Asheesh Bedi, Peter J.L. Jebson, and Levi Hinkelman**
- 3 Intramedullary Fixation of Forearm Shaft Fractures 23  
**Charles T. Mehlman**
- 4 Open Reduction and Internal Fixation of Diaphyseal Forearm Fractures 33  
**Lee M. Reichel and John R. Dawson**
- 5 Open Reduction and Internal Fixation of Displaced Lateral Condyle Fractures of the Humerus 45  
**Kristan A. Pierz and Brian G. Smith**
- 6 Open Reduction and Internal Fixation of Fractures of the Medial Epicondyle 52  
**Brian G. Smith and Kristan A. Pierz**
- 7 Open Reduction of Supracondylar Fractures of the Humerus 57  
**Christine M. Goodbody and John M. Flynn**
- 8 Closed Reduction and Percutaneous Pinning of Supracondylar Fractures of the Humerus 61  
**Paul D. Choi and David L. Skaggs**
- 9 Reconstruction for Missed Monteggia Lesion 69  
**Apurva S. Shah and Peter M. Waters**
- 10 Closed, Percutaneous, Intramedullary, and Open Reduction of Radial Head and Neck Fractures 81  
**Roger Cornwall**
- 11 Open Reduction and Internal Fixation of Radial Head and Neck Fractures 94  
**Yung Han, George Frederick Hatch III, and John M. Itamura**
- 12 Management of Simple Elbow Dislocation 105  
**Bradford O. Parsons and David M. Lutton**
- 13 Open Reduction and Internal Fixation of Pediatric T-Condylar Fractures 113  
**Keith D. Baldwin and John M. Flynn**
- 14 Open Reduction and Internal Fixation of Capitellum and Capitellar–Trochlear Shear Fractures 123  
**Asif M. Ilyas, Michael Rivlin, and Jesse B. Jupiter**
- 15 Supracondylar Humeral Osteotomy for Correction of Cubitus Varus 131  
**Yi-Meng Yen, Richard E. Bowen, and Norman Y. Otsuka**
- 16 Humeral Shaft Fracture Stabilization with Elastic Nails 136  
**Nathan W. Skelley and J. Eric Gordon**
- 17 Plate Fixation of Humeral Shaft Fractures 144  
**Matthew J. Garberina and Charles L. Getz**
- 18 Pediatric Proximal Humerus Fractures 153  
**Craig P. Ebersson**
- 19 Open Reduction Internal Fixation of Proximal Humerus Fractures 160  
**Mark T. Dillon, Stephen Torres, Mohit Gilotra, and David L. Glaser**
- 20 Open Reduction and Internal Fixation of Clavicular Fractures 169  
**J. Todd R. Lawrence and R. Justin Mistovich**
- 21 Sternoclavicular Fracture Injury 173  
**R. Jay Lee, Afamefuna M. Nduaguba, and David A. Spiegel**



- 22 Pediatric Hip Fractures 179  
**Ernest L. Sink and Benjamin F. Ricciardi**
- 23 Closed Reduction and Spica Casting of Femur Fractures 186  
**Howard R. Epps, Matthew R. Garner, and John M. Flynn**
- 24 Closed Reduction and External Fixation of Femoral Shaft Fractures 191  
**Afamefuna M. Nduaguba and John M. Flynn**
- 25 Flexible Intramedullary Nailing of Femoral Shaft Fractures 197  
**Christine M. Goodbody and John M. Flynn**
- 26 Submuscular Plating of Pediatric Femur Fractures 202  
**Ernest L. Sink and Benjamin F. Ricciardi**
- 27 Trochanteric Entry Nailing for Pediatric Femoral Shaft Fractures 207  
**J. Eric Gordon and June C. Smith**
- 28 Distal Femoral Physeal Fractures 217  
**Martin J. Herman**
- 29 Open Reduction and Internal Fixation of the Distal Femur 227  
**Animesh Agarwal**
- 30 Pediatric Tibial Fractures 254  
**Craig P. Ebersson**
- 31 External Fixation of the Mature Tibia 262  
**J. Tracy Watson**
- 32 Intramedullary Nailing of the Mature Tibia 279  
**Mark A. Lee, Jonathan G. Eastman, and Brett Crist**
- 33 Intramedullary Nailing of Metaphyseal Proximal and Distal Fractures of the Mature Tibia 296  
**Robert Ostrum and Michael Quackenbush**
- 34 Tibial Tuberosity Fractures 305  
**Eric W. Edmonds**
- 35 Pediatric Ankle Fractures 310  
**Scott J. Mubarak and Andrew T. Pennock**
- 36 Open Reduction and Internal Fixation of the Mature Ankle 320  
**Sanjit R. Konda and Kenneth A. Egol**
- 37 Open Reduction and Internal Fixation of Lisfranc Injury 332  
**Michael P. Clare and Roy W. Sanders**
- 38 Fasciotomy of the Leg for Acute Compartment Syndrome 342  
**George Partal, Andrew Furey, and Robert V. O'Toole**
- 
- SECTION II ARTHROSCOPIC AND SPORTS MEDICINE
- 39 Elbow Arthroscopy for Panner Disease and Osteochondritis Dissecans 355  
**Theodore J. Ganley, Christine M. Goodbody, J. Todd R. Lawrence, and R. Jay Lee**
- 40 Arthroscopic Treatment of Elbow Loss of Motion 361  
**Laith M. Al-Shihabi, Chris Mellano, Robert W. Wysocki, and Anthony A. Romeo**
- 41 Acute Patellar and Chronic Patellar Instability 371  
**Eric J. Wall, Jay C. Albright, and Sarah R. Steward**
- 42 Tibial Tubercle Transfer 382  
**John P. Fulkerson**
- 43 Knee Lateral Release 390  
**Andrea M. Spiker, Carl H. Wierks, and Andrew J. Cosgarea**
- 44 Arthroscopy-Assisted Management or Open Reduction and Internal Fixation of Tibial Spine Fractures 396  
**Itai Gans and Theodore J. Ganley**
- 45 Anterior Cruciate Ligament Reconstruction in the Skeletally Immature Patient 405  
**J. Todd R. Lawrence, R. Jay Lee, and Mininder S. Kocher**
- 46 Posterior Cruciate Ligament Surgery 418  
**Amanda L. Weller, Craig S. Mauro, and Christopher D. Harner**
- 47 Arthroscopic Drilling and Fixation of Osteochondritis Dissecans 430  
**Theodore J. Ganley, Kevin G. Shea, and Nathan L. Grimm**
- 48 Meniscopectomy for Discoid Lateral Meniscus 438  
**Jay C. Albright**
- 49 Osteochondritis Dissecans and Large Osteochondral Defects of the Knee 442  
**Kevin G. Shea, John Polousky, and Noah Archibald-Seiffer**
- 50 Chronic Exertional Compartment Syndrome 450  
**Jonathan A. Godin, Jocelyn R. Wittstein, L. Scott Levin, and Claude T. Moorman III**



---

**SECTION III RECONSTRUCTION**


---

- 51 Femoral Rotational Osteotomy (Proximal and Distal) 461  
**Robert M. Kay**
- 52 Proximal Femoral Varus Osteotomy Using a 90-Degree Blade Plate 476  
**Tom F. Novacheck**
- 53 Treatment of Congenital Femoral Deficiency 482  
**Dror Paley**
- 54 Surgical Repair of Irreducible Congenital Dislocation of the Knee 502  
**Matthew B. Dobbs**
- 55 Surgical Management of Blount Disease 508  
**Richard S. Davidson**
- 56 Percutaneous Distal Femoral or Proximal Tibial Epiphysiodesis for Leg Length Discrepancy 515  
**Emily R. Dodwell and Roger F. Widmann**
- 57 Excision of Physeal Bar 523  
**Anthony A. Stans**
- 58 Repair of Congenital Pseudarthrosis of the Tibia with the Williams Rod 531  
**Perry L. Schoenecker and Margaret M. Rich**
- 59 Limb Lengthening Using the Ilizarov Method or a Monoplanar Fixator 538  
**Roger F. Widmann, Emily R. Dodwell, Purushottam A. Gholve, and Arkady Blyakher**
- 60 Guided Growth to Correct Limb Deformity 550  
**Ryan D. Muchow and Kenneth J. Noonan**
- 61 Distal Tibial Osteotomy 558  
**J. Eric Gordon**
- 62 Multiple Percutaneous Osteotomies and Fassier-Duval Telescoping Nailing of Long Bones in Osteogenesis Imperfecta 567  
**Paul W. Esposito and François Fassier**
- 63 Syme and Boyd Amputations for Fibular Deficiency 580  
**Anthony Scaduto and Robert M. Bernstein**

---

**SECTION IV NEUROMUSCULAR CORRECTION**


---

- 64 Adductor and Iliopsoas Release 589  
**Tom F. Novacheck**

- 65 Rectus Femoris Transfer 595  
**Jon R. Davids**
- 66 Proximal Hamstring and Adductor Lengthening 601  
**Freeman Miller and Kirk W. Dabney**
- 67 Distal Hamstring Lengthening 605  
**Jon R. Davids**
- 68 Lengthening of Gastrocnemius Fascia 613  
**James J. McCarthy and David A. Spiegel**
- 69 Distal Femoral Osteotomy for Crouch Gait 620  
**Tom F. Novacheck**

---

**SECTION V CYSTS**


---

- 70 Operative Management of Unicameral Bone Cyst, Aneurysmal Bone Cyst, and Nonossifying Fibroma 626  
**Alexandre Arkader**

---

**SECTION VI UPPER EXTREMITY**


---

- 71 Release of Simple Syndactyly 634  
**Donald S. Bae**
- 72 Preaxial and Postaxial Polydactyly 642  
**Robert Carrigan**
- 73 Amniotic Band Syndrome 647  
**Joshua M. Abzug and Scott H. Kozin**
- 74 Clinodactyly 654  
**Robert Carrigan**
- 75 Correction of Thumb-in-Palm Deformity in Cerebral Palsy 657  
**Thanapong Waitayawinyu, Carley Vuillermin, and Scott N. Oishi**
- 76 Release of the A1 Pulley to Correct Pediatric Trigger Thumb 665  
**Roger Cornwall**
- 77 Transfer of Flexor Carpi Ulnaris for Wrist Flexion Deformity 671  
**Ann E. Van Heest**
- 78 Radial Dysplasia Reconstruction 676  
**Carley Vuillermin, Marybeth Ezaki, and Scott N. Oishi**
- 79 Forearm Osteotomy for Multiple Hereditary Exostoses 682  
**Carley Vuillermin, Carla Baldrighi, and Scott N. Oishi**



- 80 Modified Woodward Repair of Sprengel Deformity 689  
**J. Richard Bowen**
- 
- SECTION VII SPINE
- 
- 81 Release of the Sternocleidomastoid Muscle 694  
**Gokce Mik, Denis S. Drummond, and B. David Horn**
- 82 Posterior Cervical Arthrodeses: Occiput–C2 and C1–C2 701  
**Jaime A. Gomez and Daniel J. Hedequist**
- 83 Posterior Cervical Fusion with Lateral Mass Screws 715  
**Jonathan H. Phillips and Lindsay Crawford**
- 84 Posterior Exposure of the Thoracic and Lumbar Spine 721  
**Wudbhav N. Sankar and John M. Flynn**
- 85 Posterior Spinal Fusion for Idiopathic Scoliosis 728  
**Peter O. Newton and Vidyadhar V. Upasani**
- 86 Posterior Osteotomies of the Spine 736  
**Daniel Grant, Leok-Lim Lau, and Suken A. Shah**
- 87 Kyphectomy in Spina Bifida 747  
**Richard E. McCarthy**
- 88 Anterior Interbody Arthrodesis with Instrumentation for Scoliosis 754  
**Janay E. Mckie and Daniel J. Sucato**
- 89 Thoracoscopic Release and Fusion for Scoliosis 765  
**Daniel J. Sucato and Matthew D. Abbott**
- 90 Spinal Fusion for Neuromuscular Scoliosis 772  
**Kirk W. Dabney and Freeman Miller**
- 91 Pelvic Fixation for Neuromuscular Scoliosis 787  
**Jaysson T. Brooks and Paul D. Sponseller**
- 92 Casting for Early-Onset Scoliosis 795  
**James O. Sanders**
- 93 Growing Rod Instrumentation for Early-Onset Scoliosis 801  
**Christine M. Goodbody and John M. Flynn**
- 94 Hemivertebra Excision 808  
**Daniel J. Hedequist and Michael P. Glotzbecker**
- 95 Decompression, Posterolateral, and Interbody Fusion for High-Grade Spondylolisthesis 816  
**Nanjundappa S. Harshavardhana, Dino Colo, and John P. Dormans**
- 96 Rib to Pelvis Vertical Expandable Prosthetic Titanium Rib Insertion to Manage Neuromuscular Scoliosis 827  
**Anish G. R. Potty and John M. Flynn**
- 97 Opening Wedge Thoracoplasty and Vertical Expandable Prosthetic Titanium Rib Insertion for Congenital Scoliosis and Fused Ribs 834  
**Robert M. Campbell, Jr.**
- 98 Vertebral Column Resection for Severe Rigid Spinal Deformity through an All Posterior Approach 842  
**Michael P. Kelly, Lukas P. Zebala, and Lawrence G. Lenke**
- 99 Lumbar Discectomy 854  
**Bradley K. Weiner and Ronald Mitchell**
- 
- SECTION VIII HIP
- 
- 100 Anterior Approach for Open Reduction of the Developmentally Dislocated Hip 862  
**Richard M. Schwend**
- 101 Medial Approach for Open Reduction of a Developmentally Dislocated Hip 871  
**Lori A. Karol and Jeffrey E. Martus**
- 102 Anterior Drainage of the Septic Hip in Children 878  
**Richard M. Schwend**
- 103 Innominate Osteotomy of Salter 888  
**Simon P. Kelley and John H. Wedge**
- 104 Pericapsular Osteotomies of Pemberton and Dega 894  
**Tim Schrader and W. Timothy Ward**
- 105 Labral Support (Shelf) Procedure for Perthes Disease 904  
**J. Richard Bowen**
- 106 Triple Innominate Osteotomy 912  
**Dennis R. Wenger, Maya E. Pring, and Vidyadhar V. Upasani**
- 107 Chiari Medial Displacement Osteotomy of the Pelvis 923  
**Travis H. Matheney and Brian Snyder**
- 108 Bernese Periacetabular Osteotomy 930  
**Travis H. Matheney and Michael B. Millis**
- 109 Surgical Dislocation of the Hip 940  
**Farshad Adib and Young-Jo Kim**



- 110 Valgus Osteotomy of the Proximal Femur 948  
**Wudbhav N. Sankar**
- 111 Percutaneous In Situ Cannulated Screw Fixation of the Slipped Capital Femoral Epiphysis 955  
**Richard S. Davidson and Michelle S. Caird**
- 112 Flexion Intertrochanteric Osteotomy for Severe Slipped Capital Femoral Epiphysis 962  
**Young-Jo Kim**
- 113 Modified Dunn Procedure for Slipped Capital Femoral Epiphysis 967  
**Wudbhav N. Sankar**
- 114 Treatment of Anterior Femoroacetabular Impingement through Mini-Open Anterior Approach 976  
**Diana Bitar and Javad Parvizi**
- 115 Hip Arthroscopy 995  
**John P. Salvo and Daniel P. Woods**

---

## SECTION IX FOOT AND ANKLE

---

- 116 Triple Arthrodesis 1005  
**R. Justin Mistovich, David A. Spiegel, and James J. McCarthy**
- 117 Calcaneal Lengthening Osteotomy for the Treatment of Hindfoot Valgus Deformity 1013  
**Vincent S. Mosca**
- 118 Open Lengthening of the Achilles Tendon 1024  
**Anna V. Cuomo, Norman Y. Otsuka, and Richard E. Bowen**
- 119 Split Posterior Tibial Tendon Transfer 1031  
**David A. Spiegel and James J. McCarthy**
- 120 Surgical Correction of Juvenile Bunion 1038  
**B. David Horn**
- 121 Butler Procedure for Overlapping Fifth Toe 1042  
**B. David Horn**
- 122 Surgical Treatment of Cavus Foot 1044  
**Richard M. Schwend and Brad Olney**
- 123 Resection of Calcaneonavicular Coalition 1056  
**David Scher**
- 124 Excision of Talocalcaneal Coalition 1061  
**David Scher**
- 125 Ponseti Casting 1067  
**Blaise Nemeth and Kenneth J. Noonan**
- 126 Posteromedial and Posterolateral Release for the Treatment of Resistant Clubfoot 1080  
**Richard S. Davidson**
- 127 Anterior Tibialis Transfer for Residual Clubfoot Deformity 1088  
**Kenneth J. Noonan**
- 128 Treatment of Vertical Talus 1097  
**Matthew B. Dobbs**

*Exam Table for Pediatric Orthopaedic Surgery*

## Index I-1

**Jay C. Albright, MD**

Assistant Professor  
Surgical Director of Sports Medicine  
Children's Hospital Colorado  
Aurora, Colorado

**Alexandre Arkader, MD**

Assistant Professor of Orthopaedic Surgery  
Keck School of Medicine of the University of Southern California  
University of Southern California  
Director, Musculoskeletal Tumor Program  
Children's Orthopaedic Center  
Children's Hospital Los Angeles  
Los Angeles, California

**Robert M. Bernstein, MD**

Medical Director  
Cedars-Sinai Orthopaedic Center  
Cedars-Sinai Medical Center  
Los Angeles, California

**Diana Bitar, MD**

Orthopaedic Surgeon  
Research Fellow  
Rothman Institute  
Thomas Jefferson University Hospital  
Philadelphia, Pennsylvania

**Arkady Blyakher, MD**

Department of Orthopaedic Surgery  
Hospital for Special Surgery  
New York, New York

Assistant Professor

Department of Orthopaedic Surgery  
University of Michigan Health System  
Ann Arbor, Michigan

**Robert M. Campbell, Jr., MD**

Director  
Division of Orthopedics  
Center for Thoracic Insufficiency Syndrome  
The Children's Hospital of Philadelphia  
Philadelphia, Pennsylvania

**Robert Carrigan, MD**

Assistant Professor of Clinical Orthopaedic Surgery  
Perelman School of Medicine at the University of Pennsylvania  
Attending Orthopaedic Surgeon  
Division of Orthopedics  
The Children's Hospital of Philadelphia  
Philadelphia, Pennsylvania