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EDITION

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*Mann's*  
**SURGERY OF THE  
FOOT AND ANKLE**

VOLUME

2

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Volume 2

# MANN'S SURGERY OF THE FOOT AND ANKLE

**NINTH EDITION**

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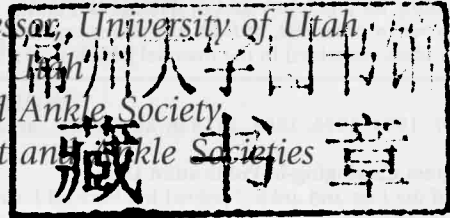
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**SAUNDERS**



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# MANN'S SURGERY OF THE FOOT AND ANKLE

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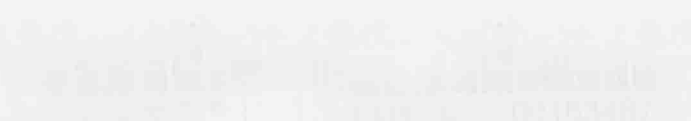
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To our parents—

Martha and Jim,  
Abraham and Ruth,  
and Dottie and Dick,

*for the opportunities they presented to us;*

*to our wives—*

Kirsten, Ingrid, and Jean,

*for their support and encouragement;*

*and to our children—*

Erin and Elizabeth;  
Hanna and Erik;  
and Ryan, Tyler, and Michael,

*for the happiness, enthusiasm,  
and joy that they bring  
to our families*

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# Preface

In 1959, Henri L. DuVries, MD, published the first edition of *Surgery of the Foot*. This text summarized his 30-year personal experience in diagnosing and treating disorders, deformities, and injuries of the foot and ankle. His book became a classic, but it was also significant because it was written by a physician who originally had obtained his training as a podiatrist and then subsequently became a doctor of medicine.

In 1965, Dr. DuVries expanded the book to include several other contributors, taking a form that is a model even for the current textbook. Included in this second edition were Verne T. Inman, MD, chairman of the Department of Orthopaedic Surgery at the University of California, San Francisco, and Roger A. Mann, MD, a senior resident in orthopaedic surgery. Eight years later, in 1973, Dr. Inman succeeded Dr. DuVries as the editor of the third edition of *Surgery of the Foot*. Again, with this text, an expanded objective included discussion of the ankle joint as well as an in-depth analysis of the biomechanics of the foot and ankle. Five years later, in 1978, Dr. Mann became the editor of the fourth edition. Dr. Mann, having been a resident under Dr. Inman and having served a fellowship under Dr. DuVries, was presented with a unique opportunity to blend the special interests of these two unique clinicians—Dr. Inman's basic biomechanical research and Dr. DuVries' wealth of clinical knowledge. In 1986, Dr. Mann edited a revised fifth edition.

In 1978, as Dr. Mann's first foot and ankle fellow, I had the opportunity to be exposed to both his philosophy of patient care and the creativity with which he addressed the evaluation and treatment of his patients. His meticulous surgical technique and comprehensive postoperative program were coupled with an introspective method of assessing the results of specific procedures to delineate the preferred treatment regimen. Dr. Mann's 45 years in private practice, stimulated by more than 75 foot and ankle fellows, have complemented my interaction with him. In 1999, I initiated my own fellowship program and have learned a great deal from the 15 fellows who I have trained. I also have frequently reviewed the surgical procedures used in my everyday practice, with the common goal of defining the strengths of individual procedures as well as their weaknesses. From the 34 years that I have been in private practice in Boise, Idaho, I have come to

believe that the principles initially espoused by Drs. Inman and DuVries and expanded on by Dr. Mann have given me a unique perspective.

In 1993, Dr. Mann and I collaborated on the sixth edition, which was expanded to a comprehensive two-volume text. In 1999, this was revised by us as the seventh edition and, in 2005, it was published as a colorized eighth edition, in which we were joined by, Dr. Charles L. Saltzman, as a co-editor.

This is a living text and has continued to evolve from the initial work of Henri L. DuVries. Much of our orthopaedic careers have been devoted to working with this text; Dr. Mann has contributed to or edited all but one of the first eight editions, and I have contributed to or edited half of the editions. However, change and growth are important! As of this edition, Dr. Mann has become an editor emeritus but has continued to give us his input and valued advice. To recognize and honor his invaluable contributions to the textbook, we have named this ninth edition *Mann's Surgery of the Foot and Ankle*. Most important, Robert B. Anderson, MD, a past fellow of John Gould, MD, joins Dr. Saltzman and me as an editor of this text. Dr. Anderson brings a wealth of clinical knowledge and a sports medicine background to this association. Just as Dr. DuVries complemented his text by adding Dr. Inman, and Dr. Inman introduced Dr. Mann, we feel strongly that Dr. Anderson's addition will make this a stronger and more well-rounded work. The ninth edition is also enhanced by the work of many of our excellent fellows and colleagues from around the world who have made substantial sacrifices to contribute to this textbook. In this edition, 25 authors continue to contribute, but 42 new authors have been added. These contributing authors are at the forefront of their specific area of foot and ankle surgery. Each contributing author has covered a specific topic in a comprehensive fashion, which we believe will leave the reader with a clear, concise appreciation of the subject. Although this book is not meant to be encyclopedic in nature, our goal has always been to provide the reader with a method of evaluating and treating a particular problem. More than 40% of the ninth edition has been completely rewritten by both new and returning contributors, and the remaining chapters have been updated.

In 1990, Dr. Mann and I published the *Video Textbook of Foot and Ankle Surgery*, the second volume of which appeared in 1995. This enabled foot and ankle surgeons to view a surgical procedure while simultaneously reading about the operative technique. Encouraged by the success of this endeavor, the eighth edition of *Surgery of the Foot and Ankle* incorporated, for the first time, 60 edited videos on two DVDs. This unique addition has now become an industry standard. To enhance the current edition, we have retained 45 classic videos narrated by Dr. Mann and added 75 new videos contributed by us as well as many other colleagues. Furthermore, advances in Internet and online learning have enhanced the electronic version of the ninth edition textbook and video compilation to allow viewing on smartphone and tablet devices before performing surgical procedures, affecting both learning and improving patient care.

This new edition has been divided into 10 sections that have been subdivided into chapters. Specific surgical techniques within the chapters are described and illustrated in detail to afford the reader an understanding of the indications for each procedure and insight into the performance of the technique. Although many different treatment regimens are presented, our goal is to recommend a specific treatment plan for each pathologic entity. Furthermore, some topics are presented in more than one section, enabling the reader to appreciate the varying points of view presented by individual contributors. It is our goal to provide the reader with an accurate assessment of both the attributes and the deficiencies of specific orthopaedic foot and ankle procedures, new and old. In this edition, we present our most up-to-date thinking regarding the diagnosis, treatment, and specific surgical care of foot and ankle problems.

In **Part I, General Considerations**, the biomechanics, examination, and conservative treatment of foot and ankle problems are addressed. In large part, the initial principles advocated by Dr. DuVries, Dr. Inman, and Dr. Mann, as presented in their early editions, are included in this portion of the text but have been updated. Anesthetic techniques have been completely rewritten and have been updated to include popliteal blocks and indwelling catheters. Discussions of imaging methods, an integral part of the evaluation process for foot and ankle disorders, have also been completely rewritten and include in-depth coverage of magnetic resonance imaging and computed tomography.

In **Part II, Forefoot**, an extensive analysis of deformities of the great toe, along with complications associated with individual hallux valgus procedures, has been completely revised to make the reader aware of primary surgical techniques as well as salvage techniques used for postsurgical complications. Inclusion of newer, popular surgical techniques has been added. The chapter on lesser toes has been completely rewritten and updated because of the vast number of advances made in the area of

plantar plate tears and treatment of this complex problem. The chapters on sesamoids, keratotic disorders, and toenail abnormalities have all been updated as well.

**Part III, Nerve Disorders, and Part IV, Miscellaneous**, have been completely updated to cover both acquired and static neurologic disorders; the material about heel pain has been rewritten and updated by new authors.

**Part V, Soft Tissue Disorders of the Foot and Ankle**, includes revised chapters on infection, dermatology, and soft tissue reconstruction and a completely new chapter on tumors of the foot and ankle.

**Part VI, Arthritis, Postural Disorders, and Tendon Disorders**, has been completely revamped, updating our current knowledge and treatment of systemic inflammatory arthritis, traumatic arthritis, and osteoarthritis. The chapter on total ankle arthroplasty presents substantial changes because of the dramatic developments that have occurred over the past decade in ankle joint replacement. Revisions of the chapters on pes planus and pes cavus are included. The chapter on arthrodesis of the foot has been replaced by one on arthritis of the hindfoot and midfoot, containing both assessment and surgical treatment of conditions in this region. The chapter on tendon abnormalities has been extensively rewritten to reflect significant technical advances in this area.

A separate section, **Part VII, Diabetes**, contains three completely updated chapters on diabetes, amputations, and prostheses of the foot and ankle.

**Part VIII, Sports Medicine**, includes a comprehensive chapter on athletic soft tissue injuries as well as specific chapters regarding stress fractures and arthroscopy; all three chapters have been revised and updated to familiarize the reader with this exciting and evolving area of orthopaedic technology.

**Pediatrics** is covered in **Part IX** with two chapters: a general pediatric chapter and a separate chapter on congenital and acquired neurologic disorders, where new authors have added significant new information.

Finally, **Part X, Trauma**, includes six chapters. These chapters, which have been updated and revised, include discussion of fractures of the distal tibia; ankle; dislocations of the foot and ankle; and calcaneus talus, midfoot, and forefoot fractures, which are covered in a comprehensive fashion.

As Roger Mann stated in the preface of the fifth edition, "As medicine continues to progress, the information of this textbook will again need to be upgraded. The principles presented, however, are basic in their approach and will not change significantly over the years." We believe that the ninth edition of *Mann's Surgery of the Foot and Ankle* will strongly enhance this dynamic and exciting field of orthopaedics and will complement the learning experience of the resident and fellow-in-training as well as the practicing surgeon.

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*Michael J. Coughlin, MD  
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Volume 1



We are proud to dedicate the ninth edition of *Surgery of the Foot and Ankle* to Roger A. Mann, MD, and have changed the official name to *Mann's Surgery of the Foot and Ankle*. Dr. Mann served as a mentor and teacher at a time when there were few foot and ankle fellowships or fellows. He guided the *American Orthopaedic Foot and Ankle Society* in its early years and promoted education of residents and surgeons in active practice through programs at the *American Academy of Orthopedic Surgeons* and the *American Orthopaedic Foot and Ankle Society* meetings. Prolific in his studies and publications, he has introduced more than 75 fellows to his methods of investigation and surgery, thus truly changing surgery in America during his time. He took the rather small primer entitled *Surgery of the Foot* and changed it to a two-volume color textbook—*Surgery of the Foot and Ankle*, with a video supplement—that has become the definitive textbook for foot and ankle surgery in the world.

His vision and action are proof that one man can truly make a difference, and he has done that.

*(Faint, partially obscured text from the table of contents is visible in the background)*



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