The diagnosis and treatment of idiopathic scoliosis, as well as more complex types of spinal deformity, has experienced revolutionary advances since Paul Harrington of Houston introduced the concept of Harrington rod instrumentation and then instrumentation plus fusion (Moe) in about 1960. Prior to that, surgical correction of scoliosis was unpredictable and difficult, depending on in situ posterior spinal fusions (Hibbs, 1911), followed by prolonged periods of casting in large, often grotesque body casts (LeMesurier et al., “fishnet” cast).

Following Paul Harrington's revolutionary introduction, instrumented surgical correction of scoliosis made evolutionary gains, including Luque spinal instrumentation (laminar wiring), the segmental attachment of spinal instrumentation including derotation (Cotrel and Dubousset), and the more revolutionary concept of pedicle screw attachment to the spine (Roy and Camille) that provided an even better grasp for segmental control and correction.

As these advances were evolving, spine treatment centers of excellence evolved throughout the world (United States, France, United Kingdom, Germany, and elsewhere). The German school of scoliosis surgery became internationally recognized in the 1970s and 1980s through the work of Klaus Zielke in Bad Wildungen, where I gained first-hand exposure to German thinking while attending an international scoliosis instructional course in the mid-1980s. At that time, a dynamic, energetic, and relatively junior-level professor, Jürgen Harms, presented his work. Despite his young age, whispered conversations in the teaching auditorium and operating rooms concluded that Harms represented the future of German spine and scoliosis surgery. This new and important text represents to a great extent the accuracy of that prophecy.

Other developments in the 1970s and 1980s included major advances in the management of scoliosis and spinal disorders by brilliant surgeons who worked in regional centers, including Kenton Leatherman at the Kosair Children's Hospital in Louisville, Kentucky, and Robert Dickson, a prior fellow with Dr. Leatherman, who then became professor and head of the orthopedic department at the University of Leeds in the United Kingdom. Their landmark 1988 textbook, The Management of Spinal Deformities, synthesized a global understanding of scoliosis, but was never revised to a second edition. Instead, that classic text provided the basic model for this new Harms Study Group book. In fact, the first four chapters are written by Dickson.

The dynamic, innovative, and often complex methods for correcting spinal deformity developed by Harms and colleagues in Germany quickly spread throughout much of Europe and then to the United States—first, via Harry Shufflebarger (Miami), and then to other North American centers dedicated to the concepts of Harms' treatment methods, including Randy Betz (Philadelphia), Peter Newton (San Diego), and Michael O’Brien (Dallas). The international multicenter Harms Study Group was then developed. This organization, which in some ways resembles the long-term patient follow-up program set up by the A-O documentation center in Bern and Davos, Switzerland, was established to study the efficacy of scoliosis treatment methods.

The Harms Study Group database has become a world-class information source regarding scoliosis treatment outcomes, which has led to hundreds of publications and presentations (Scoliosis Research Society and other conferences). The result has been a synthesis of current knowledge and thinking about the treatment of spinal deformity, both in children and adolescents, as well as adults.

Scoliosis fellows, young surgeons, and even experienced scoliosis surgeons, will find much that is new and important in this book. Just reading Robert Dickson on the history, pathogenesis, epidemiology, and basic principals of scoliosis treatment justifies owning this book, while at the same time correcting the intellectual deficit of not having read or had access to the original The Management of Spinal Deformities by Leatherman and Dickson.

This book provides a strong basis for understanding scoliosis as we enter the second decade of the twenty-first century and will likely remain a landmark work throughout the century—a period which promises unrivaled further advances in understanding and treating the still somewhat mysterious condition known as idiopathic scoliosis.

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Preface

The concept for this complete and current book, addressed entirely to the disorder known as idiopathic scoliosis at all stages of life, had its origin in the experience of the Harms Study Group. The Harms Study Group was initiated in 1995 to investigate questions relating to idiopathic spinal deformity. The Group has prospectively collected data for patients treated surgically for idiopathic deformities of the spine in adolescence, which included more than 2300 patients as of 2010. It was felt that the experience gained from this group of patients would serve as a sound foundation for this textbook, and many of the facts addressed in the book come from an analysis of this database.

All of the contributors to this work are recognized experts in the evaluation and treatment of spinal deformity. This book presents all aspects of the evaluation and treatment of idiopathic spinal deformity. Specific surgical approaches to the several types of adolescent deformity are presented, with the rationale, techniques, and results for each. And because the database of the Harms Study Group covers the past 15 years, this book provides details of changes in and the evolution of current techniques in surgery for adolescent idiopathic deformities of the spine.

This state-of-the-art work on idiopathic spinal deformity should be most useful to those who treat this problem. It should also be valuable to all practitioners of nonsurgical care for spinal deformities and to all who work with patients who have such deformities.
Acknowledgments

The processes of writing and publishing this first book specifically dedicated to adolescent idiopathic scoliosis and its lifelong ramifications could not have been accomplished without contributions from many sources. We hope to give all of them the credit that is their due for helping to make this book possible.

The idea for this book began with the core members of the Harms Study Group, particularly Jürgen Harms, Peter Newton, and Randy Betz. Without the initiative and constant input of these surgeons, this book would never have been begun or completed.

Lutz Biedermann provided the initial funding for starting the project of writing. Without him, this book would never have been begun. Our thanks to Lutz.

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Michael F. O’Brien undertook the enormous task of editing this project, which required vast amounts of time, knowledge, and energy. Many assistant editors brought the peer review of the book to fruition and spent uncounted hours completing its editing. The text would not have been finished without the diligent efforts of all, including Fran Faro, Burt Yaszay, Pat Cahill, and William Lavelle. We thank the many authors involved in writing the chapters for this book and express our gratitude for their contributions to the finished product.

We thank Michelle Marks, multisite coordinator for the Harms Study Group, for her vital contributions, which included coordinating all inquiries related to the study group database, assisting in the analysis of these inquiries, and providing invaluable insight into interpretation of the necessary data.

Raymarla Pinteric has been the driving force in pushing this text to completion. Without her devotion to the task and her firmly guiding hand in dealing with all of the editors and authors involved in it, the project would not have been completed. Our thanks to Ray.