

Fritz Hefti

# Pediatric Orthopedics in Practice

Second Edition

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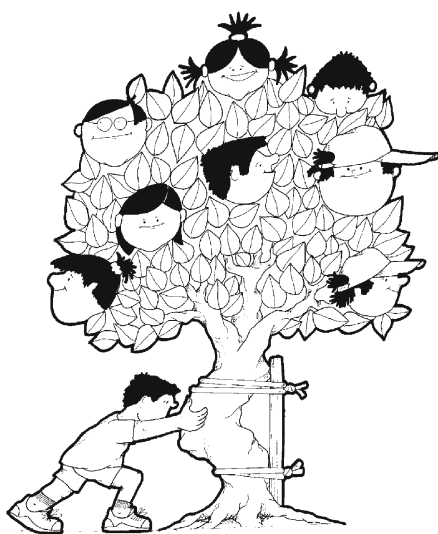
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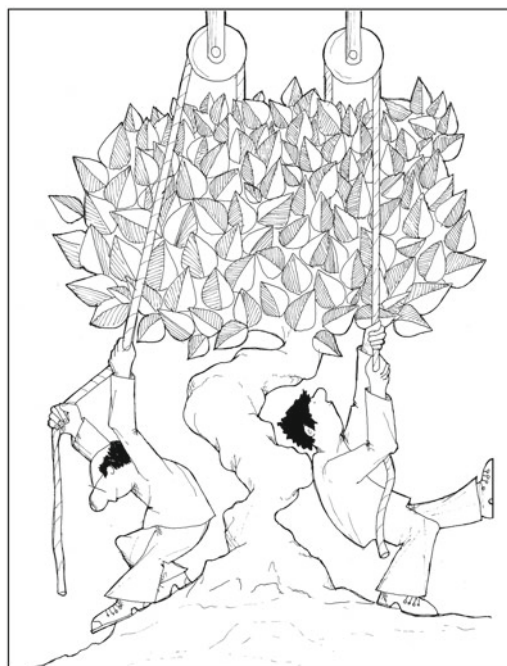
## Preface to the second edition

» *The electric light was not discovered as a result of the development of candles (author unknown).*



Correction and growth control have been key therapeutic principles in orthopaedics ever since Nicolas Andry coined the term in 1646.

Real progress in medicine arises from novel approaches, rarely from the perfection of what already exists. Naturally, what is already known and in existence still forms the basis for new developments. Both the candle and the filament in a light bulb obtain the energy for emitting light from the thermal motion of their particles. There have been countless examples of new approaches in the past that profoundly changed the therapeutic possibilities, for example the introduction of the elastic intramedullary nails for the management of fractures in children and adolescents, circular fixators for leg lengthening and correction of deformities or the containment operations in Legg-Calvé-Perthes disease. Moreover, certain long-established ideas whose value is not recognized for years often achieve the breakthrough only at a much later stage. In the treatment of clubfoot for example, the conservative Ponseti method has now largely replaced extensive operations, but only some 40 years after it was first described. What works for clubfoot has also proved successful, in modified form, for congenital flat foot. Here too, very good results can



Genuine innovations require novel approaches...

be achieved with a corrective technique, without the need for extensive surgery.

The surgical treatment of scoliosis is now over 100 years old. In 1910, Russell A. Hibbs first secured crooked spinal columns in a corrected position, after posterior fusion, with a corrective cast. The instrumented management of scoliosis is already over 50 years old. In 1961, Harrington published his technique for straightening and fixing the spine from the posterior side with rods. While nothing has changed in respect of the principle of stiffening, novel approaches are still needed here. Fortunately, such approaches have emerged at various levels in recent years. The correction of the spine in children is now possible without stiffening, while the growth potential is preserved, or even promoted by active distraction. New operations at intermittent intervals are no longer constantly required for lengthening, as this can now be controlled remotely with a magnetic drive. While substantial improvements in the treatment options are expected in these therapeutic techniques over



Time-consuming treatment is not always necessary. Sometimes regular watering of the sapling is all that's required...

the coming years, they are also associated with stiffening. If freedom of movement of the spine is hampered by an implant for longer than a few months, stiffening will inevitably occur. The same would apply to a knee that was immobilized in a cast for a year. Nevertheless, some hopeful approaches are on the horizon, and the concept of »non-fusion« may become a reality in the not too distant future.

The half-life of medical knowledge is extremely short, so it is not surprising that this new edition contains substantial new material, while old information has also had to be deleted. The literature references have been comprehensively updated, with two-thirds being deleted and replaced by new ones. This has also resulted in major substantive changes to the text.

The structure of the book has also been modified: It is now divided into three sections and the chapters are numbered consecutively, simplifying the figures stated for the cross-references. The chapters are structured in such a way that the individual pathologies are generally assigned their own section number, while the subheadings within the pathologies are not numbered.

Franz Freuler has drawn many new cartoons, and numerous illustrations with clinical images, radiographs and schematic drawings have been added, resulting in a total of more than 150 new illustrations. In addition to his chapters on fracture management and the correction of deformities, Carol Hasler is now cited as co-author in the chapter on the spine, which incorporates many of his innovative contributions. In the general section I have added a separate chapter on biomechanics.

Major changes have also been made to the chapter on skeletal dysplasias. As a result of the constantly changing developments in genetics, the International Classification has also been updated since the 1st edition. This chapter is structured as in the previous edition, but is now subdivided very differently. The third digit of the section number corresponds to the respective group number of the International Classification.

» *How should we fertilize the fields of progress if we stopped making enough manure? (Peter Schumacher).*

New findings have been incorporated to a greater or lesser extent in all the chapters: Important new treatments have been developed for the management of juvenile rheumatoid arthritis, while new entities and concepts have been adopted in tumor diagnosis, both of which were not yet relevant at the time of the last edition or have replaced other pathologies (for example vascular malformations, pleomorphic soft tissue sarcomas). New therapeutic approaches are also described for tumor treatment, femoroacetabular impingement is reported more precisely and in greater detail, the Dobbs method for treating flat foot is described, a table on the differential diagnosis of foot pain has been newly added, more space has been allocated to the description of the correction of deformities with the Fitbone® implant, various new classifications have also been added, as well as new concepts in neuro-orthopaedics, to mention just a few of the many new entries.

Once again I have received many ideas from readers and colleagues. I have handed over the leadership of the Pediatric Orthopaedic Department in Basel to my former colleague Carol Hasler, who has already achieved an outstanding international profile particularly in the field of surgery for spinal deformities. He has given me the opportunity to continue working as a medical consultant, which enables me to keep in touch with everyday clinical practice and experience new developments at first hand. This book has doubtless benefited as a result. As ever, my family has also supported me with great patience.

**F. Hefti**

Basel, January 2015

## Preface to the first edition

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» *Children are »patients«, not »customers«, they require »care«, not »management«*  
(G.A. Annas)

The term »childhood illnesses« conjures up images of a feverish condition with red spots or a baby's teething troubles – reminiscent of the scenario with a brand new car when the engine mysteriously starts to shudder on an uphill incline – but rarely evokes crooked backs or bandy legs. Orthopaedics has long since outgrown its children's shoes, particularly since its first steps stretch right back to Hippocrates (...on clubfeet one might say). Orthopaedics has since veered in the direction of orthogeriatrics, as orthopaedists worldwide are now predominantly occupied in alleviating the infirmities of the elderly (and since bone is the »firmest« structure in the human body, »infirmities« might well be viewed primarily as an orthopaedic problem...). Nevertheless, we still need the »straight trainers«, as »orthopaedists« might be described according to a literal translation from the Greek. Trains are pushed or pulled. But trainers should not »pull« or »push« (see cover illustration) too much, since this is of limited benefit with today's children, unless the child actually wants to be pulled or pushed. Pediatric orthopaedics ultimately involves motivating children »to want to be straight« (which explains why it is the child himself that is pushing the crooked tree trunk in the cover illustration). This requires close cooperation with parents, pediatricians, other therapists, orthopaedic technicians and nursing personnel. The idea for this book originated from pediatricians who were frequently encountering patients with musculoskeletal problems and who, during a course in pediatric orthopaedics, expressed a wish for a book that would take into account the standpoint of the pediatrician, as well as those of the children and parents. It has since grown into a comprehensive volume. Not all readers will have so much to do with »crooked« children that they will want to read everything. But perhaps they might wish to refer to this book upon encountering a specific problem. There may also be those who are not directly involved in treatment, but who would probably like to know the various available options and the corresponding factors considered in their selection. For practical purposes, this book also aims to stress

the regional (rather than a systematic) subdivision of disorders. After all, a child does not come to the doctor's office saying »I'm suffering from a growth disorder« or »I have a congenital condition«. Rather he or she will say »my back hurts« or »I have a stabbing pain in my knee«. The reader will therefore find most conditions presented under the relevant body region, whereas complex diseases are addressed in a »supraregional« manner only at the end of the book. Where possible we have cited current literature sources to back up all our statements. For ease of legibility, authors' names are only mentioned in the text if they designate a classification or treatment method.

The variability in clinical pictures in pediatric orthopaedics is considerable, and no single individual can be an expert in every field. We in Basel are in a doubly fortunate position: not only is the pediatric orthopaedic department located in a children's hospital (with all pediatric specialists in-house), it is also an independent department with attending physicians in charge of their own specialist departments. My former boss and teacher, E. Morscher, realized that pediatric orthopaedics offered the greatest opportunities in terms of autonomy and, prior to his retirement, he led what was then a subdivision of adult orthopaedics into independence. In our unit the attending physicians R. Brunner and C. Hasler are primarily concerned with neuro-orthopaedics and pediatric traumatology respectively. The chapters contributed by my two highly esteemed colleagues represent extremely valuable additions to this book. My own specialist areas are spinal surgery and orthopaedic tumors. In addition to the collaboration with pediatric oncologists, my cordial relationship with the bone pathologist G. Jundt has proved particularly fruitful. He heads the Basel-based Bone Tumor Reference Center and has contributed his considerable expertise to the corresponding chapters of the book. I have also been especially fortunate to benefit from the amicable collaboration with the privately practicing orthopaedist F. Freuler. On the one hand, he has clearly depicted the examination methods with his outstanding drawings (and in such a way that anyone can see that children are involved rather than sexless and ageless examination dolls). On the other, he has translated many

ideas into visual gags with his numerous amusing cartoons. This adds a playful touch to the book which, after all, deals with children, who always want to be taken seriously, but ideally in a humorous way. Certain situations can be described much more quickly and precisely with the help of drawings than with text alone. Who would grasp the meaning of the terms »achievement by proxy« or »early childhood development program« so quickly without the drawings on pages 8 and 9? Nor is there any reason, why reading a scientific book should not also be fun. Since our brain can store information only via the emotional center (the amygdala) we should make every effort to ensure that the transmission of knowledge is associated with positive emotions, so that what is read is also stored.

I should like to thank the staff of Springer Verlag for readily accepting these illustrations, which are unusual in a textbook, and for their active support for the project. The first edition of this book appeared in German in 1997. A completely revised 2nd edition of the German version was published in 2006. This has now been translated into English by Robert Hinchliffe. He has produced an extreme-

ly competent translation, in both subject- and language-related respects, which required almost no further editing. I should like to thank him for his excellent work. The content of certain chapters has been updated since the publication of the German edition several months ago. The translation was made possible thanks to generous financial support, and the necessary funding would not have been obtained without the initiative of my friend, the orthopaedist Dr. Rainer Peter Meyer in Baden, Switzerland. He deserves my special appreciation. I should also like to thank the individuals, companies and institutions listed below for their financial contribution to the translation costs. My thanks are also due to my staff at Basel University Children's Hospital, who made many useful suggestions. Numerous ideas also emerged from discussions with the pediatricians in our hospital. Finally, I should like to thank my dear wife Christiane, who has always shown understanding for this time-consuming »leisure« activity, who also helped read through the texts and repeatedly made useful suggestions.

**F. Hefti**

Basel, August 2006

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