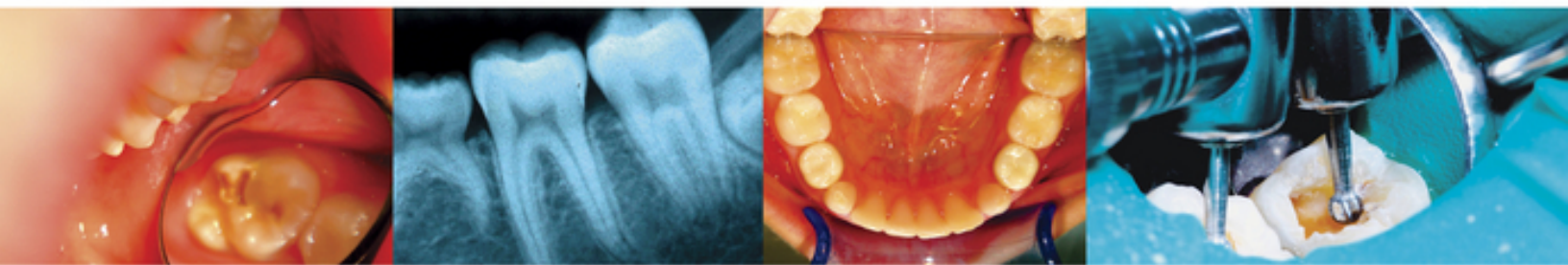


# Handbook of Clinical Techniques in Pediatric Dentistry



Edited by **Jane A. Soxman**



**WILEY** Blackwell

# Table of Contents

[Cover](#)

[Title Page](#)

[Copyright](#)

[List of contributors](#)

[Editor](#)

[Contributors](#)

[Foreword](#)

[Preface](#)

[Acknowledgments](#)

[About the companion website](#)

[Chapter 1: Interim therapeutic restoration in the primary dentition](#)

[Indications](#)

[Procedure](#)

[Materials](#)

[References](#)

[Chapter 2: Local anesthesia for the pediatric patient](#)

[Local anesthetic choice](#)

[Dosage](#)

[Injection discomfort](#)

[Inferior alveolar nerve block](#)

[Distraction](#)

[References](#)

[Chapter 3: Primary incisor restoration](#)

[Pretreatment](#)

[Oral hygiene](#)

## Indications

Bonded resin composite strip crown

Strip crown preparation

Isolation and rubber dam placement

Caries removal and crown placement—curing and finishing

Full coverage prefabricated crowns

Anterior esthetic fixed appliances

Clinical procedure

Steps in fabrication

Timing of placement: same day as extraction or delay for healing

Summary

Selected texts and figures have been adapted with permission from Dr. Kupietzky's previous works

References

## Chapter 4: Primary molar adhesive tooth restoration

Introduction

The ideal operative field: rubber dam isolation

Adhesive primary molar tooth restoration

Summary

References

## Chapter 5: Full coverage restoration for primary molars

Stainless steel crowns

Hall Technique

Esthetic crowns

References

## Chapter 6: Vital pulp therapy for primary molars

Radiographic evaluation

[Local anesthesia](#)

[Rubber dam isolation](#)

[Procedure](#)

[Medicaments](#)

[Restoration](#)

[References](#)

## [Chapter 7: Pulpectomy for primary teeth](#)

[Diagnostic concerns](#)

[Clinical evaluation and history](#)

[Pulpectomy research and filler resorbability](#)

[Pulpectomy technique](#)

[References](#)

## [Chapter 8: Extraction of primary dentition](#)

[Curette](#)

[Luxation](#)

[Extraction](#)

[Considerations with abscess](#)

[After extraction](#)

[References](#)

## [Chapter 9: Sealants](#)

[Caries detection](#)

[Moisture control](#)

[Etching/primer](#)

[Bonding agent](#)

[Partially erupted teeth](#)

[Surface preparation](#)

[Light curing](#)

[Retention and follow-up](#)

## References

### Chapter 10: Indirect pulp therapy for young permanent molars

#### Introduction

#### Background

#### Indications for indirect pulp therapy on young permanent molars

#### Diagnosis

#### Indirect pulp therapy is indicated for teeth with signs of reversible pulpitis

#### What is indirect pulp therapy (IPT)?

#### Medicaments: glass ionomer (Vitrebond) and calcium hydroxide (Dycal) (Figure 10.2)

#### How does fluoride affect certain oral bacteria *in vivo*?

#### Indirect pulp therapy technique

#### Follow-up

#### Criteria for indirect pulp therapy success

#### Success rate

#### Final restoration

#### Composite

#### Amalgam

#### Permanent stainless steel crown

#### Stainless steel crown cements

#### References

### Chapter 11: Direct pulp therapy for young permanent molars

#### Introduction

#### Background

#### Permanent tooth pulp capping

[Permanent tooth pulpotomy](#)

[Indications for direct pulp therapy in young permanent molars](#)

[What is direct pulp therapy \(DPT\)?](#)

[Diagnosis](#)

[Medicament](#)

[Technique](#)

[Follow-up](#)

[Complications](#)

[Criteria for success](#)

[Success rate](#)

[References](#)

[Chapter 12: Diagnosis and treatment of molar-incisor hypomineralization](#)

[Introduction](#)

[Prevalence and etiology](#)

[Diagnosis of molar-incisor hypomineralization](#)

[Treatment approaches for molar-incisor hypomineralization](#)

[Summary](#)

[References](#)

[Chapter 13: Ectopic eruption of maxillary first permanent molar](#)

[Introduction](#)

[Identification](#)

[Observation](#)

[Elastomer separators](#)

[The brass wire technique](#)

[Disking of the adjacent maxillary second primary molar](#)

[Distal tipping techniques](#)

[Space control](#)

[Summary](#)

[Selected texts and figures have been adapted with permission from Dr. Kupietzky's previous works](#)

[References](#)

[Chapter 14: Ectopic eruption of maxillary permanent canines](#)

[Intervention](#)

[References](#)

[Chapter 15: Infraocclusion of mandibular primary molars](#)

[Submerged with permanent successor](#)

[Submerged with congenitally missing permanent successor](#)

[References](#)

[Chapter 16: Space maintenance](#)

[Sequence of eruption](#)

[Dental age](#)

[Alveolar bone covering permanent successor](#)

[Root development of permanent successor](#)

[Time elapsed since loss of primary tooth](#)

[Space maintenance appliances](#)

[Problems with space maintainers](#)

[Primary incisors](#)

[First primary molar](#)

[Second primary molar](#)

[Banding and impression for appliance fabrication](#)

[Chairside fabrication](#)

[After appliance delivery](#)

[References](#)

[Chapter 17: Pulpal treatment in young permanent incisors following traumatic injuries](#)

[Pulp capping and pulpotomy](#)

[Apexification and apical plug](#)

[Apical barrier technique with MTA](#)

[Strengthening the root](#)

[Regenerative endodontics](#)

[References](#)

[Chapter 18: Reattachment of permanent incisor enamel fragments](#)

[Indications](#)

[Procedure](#)

[References](#)

[Chapter 19: Non-nutritive sucking and parafunctional habits](#)

[Pacifier habits](#)

[Finger/thumb sucking](#)

[Tongue thrust](#)

[Bruxing](#)

[References](#)

[Chapter 20: Behavior guidance](#)

[Age-appropriate expectations](#)

[Mouth props](#)

[Guidance techniques](#)

[Eye protection](#)

[Isolation for restorative procedures](#)

[Radiographs](#)

[Parent/guardian presence](#)

[References](#)

[Index](#)

[End User License Agreement](#)

## List of Illustrations

[Figure 1.1](#)

[Figure 1.2](#)

[Figure 1.3](#)

[Figure 1.4](#)

[Figure 1.5](#)

[Figure 1.6](#)

[Figure 1.7](#)

[Figure 1.8](#)

[Figure 2.1](#)

[Figure 2.2](#)

[Figure 2.3](#)

[Figure 2.4](#)

[Figure 2.5](#)

[Figure 2.6](#)

[Figure 2.7](#)

[Figure 2.8](#)

[Figure 2.9](#)

[Figure 2.10](#)

[Figure 2.11](#)

[Figure 2.12](#)

[Figure 2.13](#)

[Figure 2.14](#)

[Figure 2.15](#)

[Figure 2.16](#)

[Figure 3.1](#)

[Figure 3.2](#)

[Figure 3.3](#)

[Figure 3.4](#)

[Figure 3.5](#)

[Figure 3.6](#)

[Figure 3.7](#)

[Figure 3.8](#)

[Figure 3.9](#)

[Figure 3.10](#)

[Figure 3.11](#)

[Figure 3.12](#)

[Figure 3.13](#)

[Figure 4.1](#)

[Figure 4.2](#)

[Figure 4.3](#)

[Figure 4.4](#)

[Figure 5.1](#)

[Figure 5.2](#)

[Figure 5.3](#)

[Figure 5.4](#)

[Figure 5.5](#)

[Figure 5.6](#)

[Figure 5.7](#)

[Figure 5.8](#)

[Figure 5.9](#)

[Figure 5.10](#)

[Figure 5.11](#)

[Figure 5.12](#)

[Figure 5.13](#)

[Figure 5.14](#)

[Figure 5.15](#)

[Figure 5.16](#)

[Figure 5.17](#)

[Figure 5.18](#)

[Figure 5.19](#)

[Figure 5.20](#)

[Figure 5.21](#)

[Figure 5.22](#)

[Figure 5.23](#)

[Figure 5.24](#)

[Figure 5.25](#)

[Figure 5.26](#)

[Figure 5.27](#)

[Figure 5.28](#)

[Figure 5.29](#)

[Figure 6.1](#)

[Figure 6.2](#)

[Figure 6.3](#)

[Figure 6.4](#)

[Figure 6.5](#)

[Figure 6.6](#)

[Figure 6.7](#)

[Figure 6.8](#)

[Figure 6.9](#)

[Figure 6.10](#)

[Figure 6.11](#)

[Figure 6.12](#)

[Figure 6.13](#)

[Figure 6.14](#)

[Figure 7.1](#)

[Figure 7.2](#)

[Figure 7.3](#)

[Figure 7.4](#)

[Figure 7.5](#)

[Figure 7.6](#)

[Figure 7.7](#)

[Figure 7.8](#)

[Figure 7.9](#)

[Figure 7.10](#)

[Figure 7.11](#)

[Figure 7.12](#)

[Figure 7.13](#)

[Figure 8.1](#)

[Figure 8.2](#)

[Figure 8.3](#)

[Figure 8.4](#)

[Figure 8.5](#)

[Figure 8.6](#)

[Figure 8.7](#)

[Figure 8.8](#)

[Figure 8.9](#)

[Figure 9.1](#)

[Figure 9.2](#)

[Figure 9.3](#)

[Figure 9.4](#)

[Figure 9.5](#)

[Figure 9.6](#)

[Figure 9.7](#)

[Figure 9.8](#)

[Figure 10.1](#)

[Figure 10.2](#)

[Figure 10.3](#)

[Figure 10.4](#)

[Figure 10.5](#)

[Figure 10.6](#)

[Figure 10.7](#)

[Figure 10.8](#)

[Figure 10.9](#)

[Figure 11.1](#)

[Figure 11.2](#)

[Figure 11.3](#)

[Figure 11.4](#)

[Figure 11.5](#)

[Figure 11.6](#)

[Figure 11.7](#)

[Figure 11.8](#)

[Figure 11.9](#)

[Figure 11.10](#)

[Figure 12.1](#)

[Figure 12.2](#)

[Figure 12.3](#)

[Figure 12.4](#)

[Figure 12.5](#)

[Figure 13.1](#)

[Figure 13.2](#)

[Figure 13.3](#)

[Figure 13.4](#)

[Figure 13.5](#)

[Figure 13.6](#)

[Figure 13.7](#)

[Figure 13.8](#)

[Figure 13.9](#)

[Figure 13.10](#)

[Figure 13.11](#)

[Figure 13.12](#)

[Figure 13.13](#)

[Figure 13.14](#)

[Figure 13.15](#)

[Figure 13.16](#)

[Figure 13.17](#)

[Figure 13.18](#)

[Figure 13.19](#)

[Figure 13.20](#)

[Figure 13.21](#)

[Figure 14.1](#)

[Figure 14.2](#)

[Figure 14.3](#)

[Figure 14.4](#)

[Figure 14.5](#)

[Figure 14.6](#)

[Figure 14.7](#)

[Figure 14.8](#)

[Figure 14.9](#)

[Figure 14.10](#)

[Figure 15.1](#)

[Figure 15.2](#)

[Figure 15.3](#)

[Figure 15.4](#)

[Figure 15.5](#)

[Figure 15.6](#)

[Figure 15.7](#)

[Figure 15.8](#)

[Figure 15.9](#)

[Figure 15.10](#)

[Figure 15.11](#)

[Figure 15.12](#)

[Figure 16.1](#)

[Figure 16.2](#)

[Figure 16.3](#)

[Figure 16.4](#)

[Figure 16.5](#)

[Figure 16.6](#)

[Figure 16.7](#)

[Figure 16.8](#)

[Figure 16.9](#)

[Figure 16.10](#)

[Figure 16.11](#)

[Figure 16.12](#)

[Figure 16.13](#)

[Figure 16.14](#)

[Figure 16.15](#)

[Figure 16.16](#)

[Figure 16.17](#)

[Figure 16.18](#)

[Figure 16.19](#)

[Figure 16.20](#)

[Figure 16.21](#)

[Figure 16.22](#)

[Figure 16.23](#)

[Figure 16.24](#)

[Figure 16.25](#)

[Figure 16.26](#)

[Figure 16.27](#)

[Figure 17.1](#)

[Figure 17.2](#)

[Figure 17.3](#)

[Figure 17.4](#)

[Figure 17.5](#)

[Figure 17.6](#)

[Figure 17.7](#)

[Figure 17.8](#)

[Figure 17.9](#)

[Figure 17.10](#)

[Figure 17.11](#)

[Figure 18.1](#)

[Figure 18.2](#)

[Figure 18.3](#)

[Figure 18.4](#)

[Figure 18.5](#)

[Figure 18.6](#)

[Figure 18.8](#)

[Figure 18.9](#)

[Figure 18.10](#)

[Figure 18.11](#)

[Figure 18.12](#)

[Figure 18.13](#)

[Figure 18.14](#)

[Figure 18.15](#)

[Figure 18.16](#)

[Figure 19.1](#)

[Figure 19.2](#)

[Figure 19.3](#)

[Figure 19.4](#)

[Figure 19.5](#)

[Figure 19.6](#)

[Figure 19.7](#)

[Figure 19.8](#)

[Figure 19.9](#)

[Figure 19.10](#)

[Figure 19.11](#)

[Figure 19.12](#)

[Figure 19.13](#)

[Figure 19.14](#)

[Figure 19.15](#)

[Figure 20.1](#)

[Figure 20.2](#)

[Figure 20.3](#)

[Figure 20.4](#)

[Figure 20.5](#)

[Figure 20.6](#)

[Figure 20.7](#)

[Figure 20.8](#)

[Figure 20.9](#)

[Figure 20.10](#)

[Figure 20.11](#)

[Figure 20.12](#)

[Figure 20.13](#)

[Figure 20.14](#)

[Figure 20.15](#)

[Figure 20.16](#)

[Figure 20.17](#)

[Figure 20.18](#)

[Figure 20.19](#)

[Figure 20.20](#)

[Figure 20.21](#)

[Figure 20.22](#)

[Figure 20.23](#)

[Figure 20.24](#)

## **List of Tables**

[Table 9.1](#)

[Table 10.1](#)

[Table 10.2](#)

[Table 10.3](#)

[Table 11.1](#)

[Table 12.1](#)

[Table 12.2](#)

# **Handbook of Clinical Techniques in Pediatric Dentistry**

EDITED BY

**Jane A. Soxman, RN, DDS**

**WILEY** Blackwell

This edition first published 2015 © 2015 by John Wiley & Sons, Inc.

*Editorial offices:* 1606 Golden Aspen Drive, Suites 103 and 104, Ames, Iowa 50010, USA

The Atrium, Southern Gate, Chichester, West Sussex, PO19 8SQ, UK  
9600 Garsington Road, Oxford, OX4 2DQ, UK

For details of our global editorial offices, for customer services and for information about how to apply for permission to reuse the copyright material in this book please see our website at [www.wiley.com/wiley-blackwell](http://www.wiley.com/wiley-blackwell).

Authorization to photocopy items for internal or personal use, or the internal or personal use of specific clients, is granted by Blackwell Publishing, provided that the base fee is paid directly to the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923. For those organizations that have been granted a photocopy license by CCC, a separate system of payments has been arranged. The fee codes for users of the Transactional Reporting Service are ISBN-13: 978-1-118-79269-8/2015.

Designations used by companies to distinguish their products are often claimed as trademarks. All brand names and product names used in this book are trade names, service marks, trademarks or registered trademarks of their respective owners. The publisher is not associated with any product or vendor mentioned in this book.

The contents of this work are intended to further general scientific research, understanding, and discussion only and are not intended and should not be relied upon as recommending or promoting a specific method, diagnosis, or treatment by health science practitioners for any particular patient. The publisher and the author make no representations or warranties with respect to the accuracy or completeness of the contents of this work and specifically disclaim all warranties, including without limitation any implied warranties of fitness for a particular purpose. In view of ongoing research, equipment modifications, changes in governmental regulations, and the constant flow of information relating to the use of medicines, equipment, and devices, the reader is urged to review and evaluate the information provided in the package insert or instructions for each medicine, equipment, or device for, among other things, any changes in the instructions or indication of usage and for added warnings and precautions. Readers should consult with a specialist where appropriate. The fact that an organization or Website is referred to in this work as a citation and/or a potential source of further information does not mean that the author or the publisher endorses the information the organization or Website may provide or recommendations it may make. Further, readers should be aware that Internet Websites listed in this work may have changed or disappeared between when this work was written and when it is read. No warranty may be created or extended by any promotional statements for this work. Neither the publisher nor the author shall be liable for any damages arising herefrom.

*Library of Congress Cataloging-in-Publication Data*

Library of Congress Cataloging-in-Publication Data

The handbook of clinical techniques in pediatric dentistry / edited by Jane A. Soxman.

p. ; cm.

Includes index.

ISBN 978-1-118-79269-8 (pbk.)

I. Soxman, Jane A., editor.

[DNLM: 1. Dental Care for Children--methods. 2. Pediatric Dentistry--methods. 3. Tooth Diseases--therapy. WU 480]

RK63

617.6'45-dc23

2014036985

A catalogue record for this book is available from the British Library.

Wiley also publishes its books in a variety of electronic formats. Some content that appears in print may not be available in electronic books.

# List of contributors

## Editor

### **Jane A. Soxman, RN, DDS**

Diplomate of the American Board of Pediatric Dentistry,  
Private Practice Pediatric Dentistry, Allison Park, PA,  
USA

Division of Dental Medicine, Allegheny General Hospital,  
General Practice Residency Seminar and Clinical  
Instructor, Pittsburgh, PA, USA

Veterans Affairs Pittsburgh Health Care System, General  
Practice Dental Residency Educational Consultant,  
Pittsburgh, PA, USA

Adjunct Assistant Professor of Pediatric Dentistry,  
Department of Pediatric Dentistry, University of  
Pittsburgh School of Dental Medicine, Pittsburgh, PA,  
USA

## Contributors

### **Joe H. Camp DDS, MSD**

Private Practice Endodontics, Charlotte, NC, USA

Adjunct Professor, Department of Endodontics,  
University of North Carolina School of Dentistry, Chapel  
Hill, NC, USA

### **James A. Coll DMD, MS**

Diplomate of the American Board of Pediatric Dentistry,  
Private Practice Pediatric Dentistry 1974-2013, York, PA,

USA

Clinical Professor, University of Maryland Dental School,  
Department of Pediatric Dentistry, Baltimore, MD, USA

**Theodore P. Croll, DDS**

Diplomate of the American Board of Pediatric Dentistry,  
Private Practice Pediatric Dentistry, Doylestown, PA,  
USA

Affiliate Professor, Department of Pediatric Dentistry,  
University of Washington School of Dentistry, Seattle,  
WA, USA

Adjunct Professor, Pediatric Dentistry, University of  
Texas Health Science Center at San Antonio Dental  
School, San Antonio, TX, USA

**Constance M. Killian, DMD**

Diplomate of the American Board of Pediatric Dentistry,  
Private Practice Pediatric Dentistry, Doylestown, PA,  
USA

Adjunct Associate Professor of Pediatric Dentistry,  
University of Pennsylvania School of Dental Medicine,  
Philadelphia, PA, USA

**Ari Kupietzky, DMD, MSc**

Diplomate of the American Board of Pediatric Dentistry,  
Visiting Professor, Department of Pediatric Dentistry,  
Rutgers School of Dental Medicine, Rutgers, The State  
University of New Jersey, Newark, New Jersey, USA

Clinical Instructor, Department of Pediatric Dentistry,  
The Hebrew University–Hadassah School Of Dental  
Medicine, Jerusalem, Israel

**Stanley F. Malamed, DDS**

Dentist Anesthesiologist, Emeritus Professor of Dentistry, Ostrow School of Dentistry of USC, Los Angeles, CA, USA

**William F. Waggoner, DDS, MS**

Diplomate of the American Board of Pediatric Dentistry, Private Practice, Las Vegas, NV, USA

**J. Timothy Wright, DDS, MS**

Diplomate of the American Board of Pediatric Dentistry, Bawden Distinguished Professor and Chair, Department of Pediatric Dentistry, University of North Carolina, Chapel Hill, NC, USA

**Patrice Barsamian Wunsch, DDS, MS**

Diplomate of the American Board of Pediatric Dentistry, Director, Advanced Education in Pediatric Dentistry, Virginia Commonwealth University, Richmond, VA, USA

## Foreword

This *Handbook of Clinical Techniques in Pediatric Dentistry* is targeted primarily to general dentists and young pediatric dentists who would like a simplified, clinically relevant, step-by-step approach to delivering effective and efficient dental care to children of all ages. Why is a handbook such as this necessary or desirable? The answer lies primarily within the following set of facts and numbers. (i) Dental disease is the most common chronic illness in children in the United States. (ii) According to various government reports, between 25% and 44% of children will have a cavity by the time they enter kindergarten. (iii) By the age of 19 years, over two-thirds of children will have experienced tooth decay in permanent teeth. (iv) There are an estimated 74 million children between the ages of 1 and 17 years in the United States. (v) There are only 6400 active pediatric dentists in the United States, so there is virtually no possibility that 6400 practitioners could provide for the dental needs of 74 million children. (vi) There are approximately 165,000 active general dentists in the United States, many of whom see children in their practice, but might increase the numbers they see, if they felt more confident in the administration of pediatric dental techniques and skills. So considering these facts, not only is it desirable those general dental practitioners see more of the children, but also it is a logistical necessity, in order that many more children may receive appropriate oral health care.

Dr. Soxman, along with many well-known, experienced practitioners, academicians, and other related specialists, has created a well-illustrated, simplified, step-by-step approach to the most common clinical challenges and

procedures that a practitioner treating children needs to know. One of the aspects of this handbook that sets it apart from many pediatric dental textbooks is the number of chapters written, or contributed to, by pediatric practitioners who have over 20–25 years of private practice dental experience, as opposed to chapters written in most textbooks by those with a primary academic background. While this book is academically solid, its strength is in the clinical relevance and presentation of the various techniques from those who have accomplished them hundreds and thousands of times.

This handbook should become a strong clinical reference manual for those dentists who wish to improve their skills, efficiency, and confidence in treating children. Most importantly, it can help them provide an effective dental home for some small part of those 74 million children who deserve the best oral health care that can be made possible.

Congratulations to Dr. Soxman for embarking on this publishing endeavor and for acquiring such a great group of experienced, knowledgeable contributors. Over the years, I have come to know nearly all nine of the contributors in various capacities, and I know that their labors in creating this handbook is because each has given a professional lifetime of dedication to serving children. In addition, I believe that children will be well served by the practitioners who read and implement the information in this *Handbook of Clinical Techniques in Pediatric Dentistry!*

William F. Waggoner, DDS, MS, FAAPD, FACD  
Las Vegas, NV

## Preface

While speaking at an annual session of the American Dental Association, Wiley Blackwell publications requested that I meet with a commissioning editor. He inquired whether I had ever considered writing a book and if so, on what subject. My response was without hesitation. Over the past 20 plus years as a national speaker in continuing education and as a seminar instructor for general practice residents, I recalled the myriad of questions asked. I had often thought that a book on clinical techniques would provide much needed guidelines and directions for dental students, general dentists, and graduate general practice and pediatric dental residents. This book would include step-by-step descriptions, augmented with clinical photographs of routinely performed procedures and evidence-based recommendations.

The *Handbook of Clinical Techniques in Pediatric Dentistry* provides the clinician with an increased level of expertise and skills for timely identification and intervention for various presentations in the developing dentition. It also clearly describes procedures for treatment in the primary and young permanent dentitions. The most commonly encountered treatment needs are discussed, with the goal of increasing clinician and staff confidence, while decreasing chair time and stress. What you will learn and incorporate into your practice will be of tremendous benefit to you, your staff, and the children for whom you care.

Jane A. Soxman, RN, DDS  
Allison Park, Pennsylvania, USA

## Acknowledgments

I wish to thank all contributors for accepting my request to donate and share their expertise despite their already exceedingly busy professional lives. I am so grateful for their exceptional contributions and cooperation in writing and co-authoring chapters that have wholly fulfilled my vision.

I thank Miss Beth, my assistant of 22 years, for her dedication, gentle spirit, and support as together we have treated thousands of children. Her patience and determination, taking photographs over and over again, striving to capture the best possible facial or intraoral photograph, even with a reluctant or uncooperative child, are responsible for the clinical photographs. She sat beside me for hours on end during the evening and on weekends, reviewing clinical photographs, sizing them to specification, and revising and retyping legends.

In honor of her devotion to the children and to me, the *Handbook of Clinical Techniques in Pediatric Dentistry* is dedicated to Beth Ann Sutter.

Jane A. Soxman, RN, DDS