



# Textbook of Pediatric Dentistry



**Nikhil Marwah**

*Forewords*  
**Srinivas Namineni**  
**Virinder Goyal**

**4<sup>th</sup>**  
Edition



# TEXTBOOK OF PEDIATRIC DENTISTRY





# TEXTBOOK OF PEDIATRIC DENTISTRY

Fourth Edition

*Editor*

**Nikhil Marwah** BDS MDS  
Professor and Head  
Department of Pediatric Dentistry  
Mahatma Gandhi Dental College and Hospital  
Mahatma Gandhi University of Medical Sciences and Technology  
Jaipur, Rajasthan, India

*Co-editors*

**Satish Vishwanathaiah**  
Associate Professor  
Division of Pediatric Dentistry  
Jazan University, Jazan  
Saudi Arabia

**Ravi GR**  
Assistant Professor  
Division of Pediatric Dentistry  
King Faisal University, Al-Ahsa  
Saudi Arabia

*Forewords*

**Srinivas Namineni**  
**Virinder Goyal**



**JAYPEE BROTHERS MEDICAL PUBLISHERS**

*The Health Sciences Publisher*

New Delhi | London | Panama



**Jaypee Brothers Medical Publishers (P) Ltd**

#### **Headquarters**

Jaypee Brothers Medical Publishers (P) Ltd  
4838/24, Ansari Road, Daryaganj  
New Delhi 110 002, India  
Phone: +91-11-43574357  
Fax: +91-11-43574314  
Email: [jaypee@jaypeebrothers.com](mailto:jaypee@jaypeebrothers.com)

#### **Overseas Offices**

J.P. Medical Ltd  
83 Victoria Street, London  
SW1H 0HW (UK)  
Phone: +44 20 3170 8910  
Fax: +44 (0)20 3008 6180  
Email: [info@jpmedpub.com](mailto:info@jpmedpub.com)

Jaypee Brothers Medical Publishers (P) Ltd  
17/1-B Babar Road, Block-B, Shaymoli  
Mohammadpur, Dhaka-1207  
Bangladesh  
Mobile: +08801912003485  
Email: [jaypeedhaka@gmail.com](mailto:jaypeedhaka@gmail.com)

Website: [www.jaypeebrothers.com](http://www.jaypeebrothers.com)

Website: [www.jaypeedigital.com](http://www.jaypeedigital.com)

© 2019, Jaypee Brothers Medical Publishers

The views and opinions expressed in this book are solely those of the original contributor(s)/author(s) and do not necessarily represent those of editor(s) of the book.

All rights reserved. No part of this publication may be reproduced, stored or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior permission in writing of the publishers.

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.

Medical knowledge and practice change constantly. This book is designed to provide accurate, authoritative information about the subject matter in question. However, readers are advised to check the most current information available on procedures included and check information from the manufacturer of each product to be administered, to verify the recommended dose, formula, method and duration of administration, adverse effects and contraindications. It is the responsibility of the practitioner to take all appropriate safety precautions. Neither the publisher nor the author(s)/editor(s) assume any liability for any injury and/or damage to persons or property arising from or related to use of material in this book.

This book is sold on the understanding that the publisher is not engaged in providing professional medical services. If such advice or services are required, the services of a competent medical professional should be sought.

Every effort has been made where necessary to contact holders of copyright to obtain permission to reproduce copyright material. If any have been inadvertently overlooked, the publisher will be pleased to make the necessary arrangements at the first opportunity. The **CD/ DVD-ROM** (if any) provided in the sealed envelope with this book is complimentary and free of cost. **Not meant for sale.**

**Inquiries for bulk sales may be solicited at:** [jaypee@jaypeebrothers.com](mailto:jaypee@jaypeebrothers.com)

#### ***Textbook of Pediatric Dentistry***

*First Edition: 2006*

*Revised Edition: 2007*

*Second Edition: 2009*

*Third Edition: 2014*

*Fourth Edition: 2019*

ISBN: 978-93-5270-529-0

*Printed at*

# Contributors

## **Aayushi Bansal**

Pediatric Dentist  
Jaipur, Rajasthan, India

## **Amita Hegde**

Professor and Head  
Department of Pedodontics  
AB Shetty Dental College  
Mangaluru, Karnataka, India

## **Anand Nayak**

Professor  
Department of Pedodontics  
Saudi Arabia

## **Anant Nigam**

Professor  
Department of Pedodontics  
Mahatma Gandhi Dental College  
Jaipur, Rajasthan, India

## **Anirudh Agarwal**

Professor and Head  
Department of Orthodontics  
Jaipur Dental College  
Jaipur, Rajasthan, India

## **Anita Hooda**

Associate Professor and Head  
Department of Oral Anatomy  
Government Dental College  
Rohtak, Haryana, India

## **Ankur Mangal**

Orthodontist  
Jaipur, Rajasthan, India

## **Anshul Chugh**

Assistant Professor  
Department of Prosthodontics  
Government Dental College  
Rohtak, Haryana, India

## **Anup Panda**

Professor and Head  
Department of Pedodontics  
Ahmedabad Dental College  
Ahmedabad, Gujarat, India

## **Anupma Sharma**

Assistant Professor  
Department of Community Dentistry  
Government Dental College and  
Hospital  
Jaipur, Rajasthan, India

## **Anuradha Pathak**

Professor and Head  
Department of Pedodontics  
Government Dental College  
Patiala, Punjab, India

## **AR Prabhakar**

Professor and Head  
Department of Pedodontics  
Bapuji Dental College and Hospital  
Davangere, Karnataka, India

## **Archana Agnihotri**

Professor  
Department of Pedodontics  
HS Judge Institute of Dental Sciences  
Chandigarh, India

## **Arun Bhupathi**

M Tech Nanotechnology  
Assistant Professor  
Vishnu Dental College  
Bhimavaram, Andhra Pradesh, India

## **Ashwin M Jawdekar**

Professor and Head  
Department of Pedodontics  
Yerala Medical Trust's Dental College  
Navi Mumbai, Maharashtra, India

## **Asmita Sharma**

Reader  
Department of Pedodontics  
Mahatma Gandhi Dental College  
Jaipur, Rajasthan, India

## **Bharathi Padiyar**

Reader  
Department of Pedodontics  
Mahatma Gandhi Dental College  
Jaipur, Rajasthan, India

## **Binita Srivastav**

Professor and Head  
Department of Pedodontics  
Santosh Dental College  
Ghaziabad, Uttar Pradesh, India

## **Chaitanya P**

Reader, Department of Pedodontics  
Drs Sudha and Nageshwar Rao  
Siddhartha Institute of Dental Sciences  
Gannavaram, Andhra Pradesh, India

## **Chaitanya Ram**

Reader, Department of Pedodontics  
Drs Sudha and Nageshwar Rao  
Siddhartha Institute of Dental Sciences  
Gannavaram, Andhra Pradesh, India

## **Chitrita Gupta Mukherjee**

Professor and Head  
Department of Pedodontics  
Buddha Institute of Dental Sciences and  
Hospital  
Patna, Bihar, India

## **Deepak BM**

Lecturer  
Department of Pedodontics and  
Preventive Dentistry  
Bapuji Dental College and Hospital  
Davangere, Karnataka, India

## **Deepak Raisinghani**

Professor and Head  
Department of Conservative Dentistry  
Mahatma Gandhi Dental College  
Jaipur, Rajasthan, India

## **Disha Kumar**

Pediatric Dentist  
Pune, Maharashtra, India

## **Divya Jindal**

Assistant Professor  
Department of Conservative Dentistry  
Swami Devi Dyal Hospital and  
Dental College  
Sirsa, Haryana, India

**Ena Mathur**

Reader  
Department of Oral Medicine  
Pacific Dental College  
Udaipur, Rajasthan, India

**Girish AB**

Pediatric Dentist  
Queensland, Australia

**Gopakumar R**

Professor and Head  
Department of Oral Medicine and  
Radiology  
KD Dental College  
Mathura, Uttar Pradesh, India

**Gyanender Saroj**

Associate Professor  
Maulana Azad Institute of  
Dental Sciences  
New Delhi, India

**Harsh Pandey**

Reader  
Department of Orthodontics  
Rajasthan Dental College  
Jaipur, Rajasthan, India

**Hind Pal Bhatia**

Professor and Head  
Department of Pedodontics  
Manav Rachna Dental College  
Faridabad, Haryana, India

**IK Pandit**

Principal, Professor and Head  
Department of Pedodontics  
DAV (Centenary) Dental College  
Yamunanagar, Haryana, India

**Iqbal Musani**

Professor  
Department of Pedodontics  
Dr DY Patil Dental College  
Pune, Maharashtra, India

**Jigyasa Dahan**

Professor  
Department of Conservative Dentistry  
Government Dental College  
Rohtak, Haryana, India

**Kanika Singh**

Reader  
Department of Pedodontics  
Kalinga Institute of Dental Sciences  
Bhubaneswar, Odisha, India

**Karuna YM**

Assistant Professor  
Department of Pedodontics and  
Preventive Dentistry  
Manipal College of Dental Sciences  
Mangaluru, Karnataka, India

**Kiran Hegde**

Department of Pedodontics  
School of Dental Medicine  
University of Colorado  
Denver, Colorado, USA

**Kirti Asopa**

Pediatric Dentist  
Jaipur, Rajasthan, India

**Koya Srikanth**

Reader  
Department of Pedodontics  
Drs Sudha and Nageshwar Rao  
Siddhartha Institute of Dental  
Sciences  
Gannavaram, Andhra Pradesh, India

**Kshitij Rohilla**

Oral Pathologist  
New Delhi, India

**Mahesh Goel**

Professor  
Department of Oral and  
Maxillofacial Surgery  
Government Dental College  
Rohtak, Haryana, India

**Mandeep Viridi**

Principal, Professor and Head  
Department of Pedodontics  
Prabhu Dayal Memorial (PDM)  
Dental College  
Bahadurgarh, Haryana, India

**Manish Madan**

Professor  
Department of Pedodontics  
Ponta Sahib Dental College  
Himachal Pradesh, India

**Manisha Kamal**

Professor  
Department of Orthodontics  
Government Dental College  
Rohtak, Haryana, India

**Manisha Prabhakar**

Pediatric Dentist  
New Zealand

**Manju Gopakumar**

Professor  
Department of Pedodontics  
AB Shetty Memorial Institute of  
Dental Sciences  
Mangaluru, Karnataka, India

**Manju Singh**

Senior Consultant  
Department of Anesthesia  
Fortis Aashlok Hospital  
New Delhi, India

**Manohar Bhatt**

Principal, Professor and Head  
Department of Pedodontics  
Jaipur Dental College  
Jaipur, Rajasthan, India

**MB Mishra**

Periodontist  
USA

**Milind L Shah**

Pediatric Dentist  
Mumbai, Maharashtra, India

**Mitakshra Nirwan**

Assistant Professor  
Department of Pedodontics  
Mahatma Gandhi Dental College  
Jaipur, Rajasthan, India

**Mitesh Sanghvi**

Pediatric Dentist  
St. Clair Dental Practice  
Adelaide, Australia

**MK Jindal**

Professor and Head  
Department of Pedodontics  
Aligarh Muslim University Dental College  
Aligarh, Uttar Pradesh, India

**Mridula Trehan**

Principal, Professor and Head  
Department of Orthodontics  
NIMS Dental College  
Jaipur, Rajasthan, India

**MS Muthu**

Professor, Department of Pedodontics  
Meenakshi Ammal Dental College  
Chennai, Tamil Nadu, India

**Mukul Jain**

Pediatric Dentist  
Mumbai, Maharashtra, India

**Naveen Manuja**

Professor  
Department of Pedodontics  
Kothiwal Dental College  
Moradabad, Uttar Pradesh, India

**Navneet Grewal**

Pediatric Dentist  
Amritsar, Punjab, India

**Neeraj Gugnani**

Professor  
Department of Pedodontics  
DAV (Centenary) Dental College  
Yamunanagar, Haryana, India

**Neha Aggarwal**

Postgraduate  
Department of Pedodontics  
Mahatma Gandhi Dental College  
Jaipur, Rajasthan, India

**Nikhil Srivastav**

Principal  
Professor and Head  
Department of Pedodontics  
Subharti Dental College  
Meerut, Uttar Pradesh, India

**Pankaj Sangwan**

Professor  
Department of Conservative Dentistry  
Government Dental College  
Rohtak, Haryana, India

**Parvind Gumber**

Reader  
Department of Oral Pathology  
Mahatma Gandhi Dental College  
Jaipur, Rajasthan, India

**Pooja Mishra**

Postgraduate  
Department of Pedodontics  
Mahatma Gandhi Dental College  
Jaipur, Rajasthan, India

**Prabhadevi C Maganur**

Assistant Professor  
Division of Pedodontics  
Jazan University, Jazan  
Saudi Arabia

**Pradnya Kathe**

Pediatric Dentist  
Pune, Maharashtra, India

**Pragati Kaurani**

Professor, Department of Prosthodontics  
Mahatma Gandhi Dental College  
Jaipur, Rajasthan, India

**Pratima Swarnkar**

Pediatric Dentist  
New Delhi, India

**Priya Verma**

Professor  
Department of Pedodontics  
KD Dental College  
Mathura, Uttar Pradesh, India

**Puneet Goenka**

Pediatric Dentist  
Jaipur, Rajasthan, India

**Rajesh Sharma**

Professor  
Department of Pedodontics  
Jaipur Dental College  
Jaipur, Rajasthan, India

**Raju OS**

Professor  
Department of Pedodontics  
Bapuji Dental College and Hospital  
Davangere, Karnataka, India

**Ravi GR**

Assistant Professor  
Division of Pediatric Dentistry  
King Faisal University, Al-Ahsa  
Saudi Arabia

**Ravichandra KS**

Professor and Head  
Department of Pedodontics  
Drs Sudha and Nageshwar Rao  
Siddhartha Institute of Dental Sciences  
Gannavaram, Andhra Pradesh, India

**Rishi Tyagi**

Professor  
Department of Pedodontics  
University College of Medical Sciences  
Dental College  
New Delhi, India

**RK Sharma**

Professor  
Department of Periodontics  
Government Dental College  
Rohtak, Haryana, India

**Roopali Borkar**

Pediatric Dentist  
Bengaluru, Karnataka, India

**Ruchika Tiwari**

Reader  
Department of Oral and  
Maxillofacial Surgery  
Mahatma Gandhi Dental College  
Jaipur, Rajasthan, India

**Rupinder Bhatia**

Professor  
Department of Pedodontics  
Dr DY Patil Dental College  
Navi Mumbai, Maharashtra, India

**Saima Khan**

Assistant Professor  
Department of Pedodontics  
Aligarh Muslim University  
Dental College  
Aligarh, Uttar Pradesh, India

**Late Sameer Dutta**

Ex-Professor and Head  
Department of Pedodontics  
Government Dental College  
Rohtak, Haryana, India

**Sanchit Paul**

Pediatric Dentist, New Delhi, India

**Sanjay Tewari**

Principal  
Professor and Head  
Department of Conservative Dentistry  
Government Dental College  
Rohtak, Haryana, India

**Sapna Hegde**

Pediatric Dentist  
Dubai, UAE

**Saraswathi V Naik**

Reader  
Department of Pedodontics and  
Preventive Dentistry  
Bapuji Dental College and Hospital  
Davangere, Karnataka, India

**Satish Vishwanathaiah**

Associate Professor  
Division of Pediatric Dentistry  
Jazan University, Jazan  
Saudi Arabia



**Sham S Bhat**

Professor and Head  
Department of Pedodontics  
Yenepoya Dental College  
Mangaluru, Karnataka, India

**Shantanu Sharma**

Assistant Professor  
Department of Orthodontics  
Mahatma Gandhi Dental College  
Jaipur, Rajasthan, India

**Sharath Asokan**

Professor  
Department of Pedodontics  
KSR Institute of Dental Sciences  
Tiruchengode, Tamil Nadu, India

**Shashibala Singh**

Professor  
Department of Periodontics  
Government Dental College  
Rohtak, Haryana, India

**Shefali Chaturvedy**

Professor  
Department of Pedodontics  
Mahatma Gandhi Dental College  
Jaipur, Rajasthan, India

**Shilpa Ahuja**

Assistant Professor  
Department of Pedodontics  
Inderprastha Dental College and Hospital  
Ghaziabad, Uttar Pradesh, India

**Shilpy Singla**

Professor  
Department of Pedodontics  
Rishiraj Dental College  
Bhopal, Madhya Pradesh, India

**Siddharth Mehta**

Reader  
Department of Orthodontics  
Mahatma Gandhi Dental College  
Jaipur, Rajasthan, India

**Sivakumar Nuvvula**

Professor and Head  
Department of Pedodontics  
Narayana Dental College and Hospital  
Nellore, Andhra Pradesh, India

**Srinivas Namineni**

Professor and Head  
Department of Pedodontics  
Sri Sai College of Dental Surgery  
Vikarabad, Telangana, India

**Srirang Sevekar**

Professor and Head  
Department of Pedodontics  
MGM Dental College and Hospital  
Navi Mumbai, Maharashtra, India

**Sundeep Hegde K**

Professor  
Department of Pedodontics  
Yenepoya Dental College  
Mangaluru, Karnataka, India

**Sunil Raj**

Professor, Department of Pedodontics  
Maruthi Dental College  
Bengaluru, Karnataka, India

**Sunil Sharma**

Pro-Vice-Chancellor  
Professor and Head  
Department of Oral Surgery  
NIMS Dental College  
Jaipur, Rajasthan, India

**Suresh S**

Professor and Head  
Department of Preventive and  
Community Dentistry  
Vishnu Dental College  
Bhimavaram, Andhra Pradesh, India

**Swati Aggarwal**

Postgraduate  
Department of Pedodontics  
Mahatma Gandhi Dental College  
Jaipur, Rajasthan, India

**Thejo Krishna Pammi**

Pediatric Dentist  
Mumbai, Maharashtra, India

**Usha Mohan Das**

Pediatric Dentist  
Bengaluru, Tamil Nadu, India

**Usha Rehani**

Pediatric Dentist, USA

**Vemina Paul**

Pediatric Dentist  
New Delhi, India

**Vijay Lakshmi**

Postgraduate  
Department of Pedodontics  
Mahatma Gandhi Dental College  
Jaipur, Rajasthan, India

**Vikram Khare**

Professor and Head  
Department of Oral Medicine and  
Radiology  
DY Patil Dental College  
Pimpri, Maharashtra, India

**Vineet Dhar**

Professor  
Department of Pedodontics  
University of Maryland Dental School  
Baltimore, USA

**Viral Maru**

Reader  
Department of Pedodontics  
Terna Dental College  
Navi Mumbai, Maharashtra, India

**Virinder Goyal**

Vice-Principal, Professor and Head  
Surendra Dental College and  
Research Institute  
Sri Ganganagar, Rajasthan, India

**Vishwas Chaugle**

Pediatric Dentist  
Pune, Maharashtra, India

**Vishwas TD**

Professor and Head  
Department of Pedodontics  
Dr BR Ambedkar Institute of Dental  
Sciences and Hospital  
Patna, Bihar, India

**Yogita Chaturvedi**

Postgraduate  
Department of Pedodontics  
Mahatma Gandhi Dental College  
Jaipur, Rajasthan, India

# Foreword

Writing a scientific book is a big task. Updating and refining such a book to reflect a contemporary level is a bigger task. I compliment Dr Nikhil Marwah in successfully completing these tasks. Two particularly interesting topics which drew my attention are inclusion of Revascularization endodontics and Silver Diamine Fluoride as both are considered as game changers in pediatric dental field. Another noteworthy effort is its up-to-date referencing, which is a hallmark of this book.

I always appreciate the color-coded pages in the book, which makes it easy to scroll. The language used is very friendly and welcoming.

I have known Nikhil Marwah for over a decade and a half. He has burnt many midnight candles to bring out this passionate work. I am sure this edition of *Textbook of Pediatric Dentistry* will be very successful one like previous editions.

Looking forward to many more editions to come.



**Srinivas Namineni**

President

Indian Society of Pedodontics and Preventive Dentistry

Pediatric Dentist, Rainbow Hospital

Hyderabad, Telangana, India



# Foreword

It gives me immense pleasure to introduce you to the fourth edition of the *Textbook of Pediatric Dentistry* authored by Professor Dr Nikhil Marwah.

This book is excellently orchestrated by the editor with his operative skills and expertise in the field of pedodontics and preventive dentistry. He is a top-notch academician and an outstanding teacher.

The enlightenment provided in this edition has been completely amended in accordance with the syllabus of Dental Council of India (DCI) and is well embellished covering current concepts in science and technology in dentistry. I am confident that the vivid, well-illustrated book with easy language and concise flowcharts, and figures will make an interesting and informative reading for undergraduate and postgraduate students.

The entire volume of this book deals with ultramodern and current state-of-the-art techniques. The author has specifically laid stress on the topics like Silver Diamine Fluoride, Zirconia Crowns, Nasoalveolar Molding and Revascularization. This book is a perfect dovetail and combination of current and contemporary developments which are pragmatic and practical.

The editor deserves hearty congratulations for all the efforts and hard work, he has undertaken. I am sure the book will guide students into gaining an insight into the vast field of pedodontics and preventive dentistry.



**Virinder Goyal**

President

South Asian Association of Pediatric Dentistry

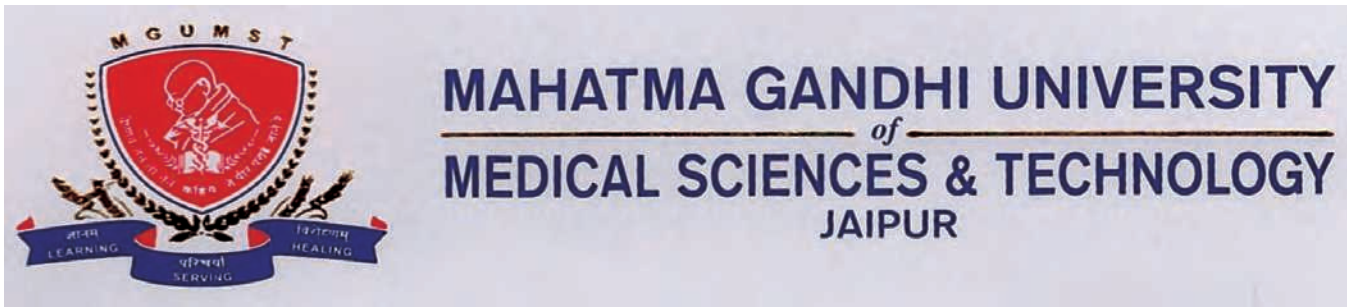
*Formerly*, President, Indian Society of Pedodontics and Preventive Dentistry

Vice-Principal, Professor and Head

Surendera Dental College and Research Institute

Sri Ganganagar, Rajasthan, India





## Message

The focus of pediatric dentistry has always been to add to the improving health of our younger generations who are the future of India. This has improved even more now as government has implemented many schemes focusing on oral health of children. The fourth edition of Dr Nikhil's textbook will surely help the undergraduates and postgraduates not only to study the subject but also to use the applications in clinical field. The plethora of contributors for this book is indicative of the immense research and compilation of this textbook.

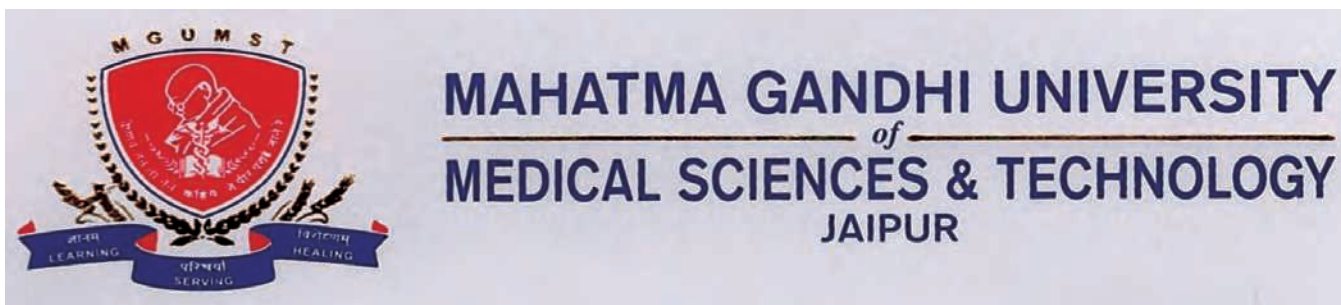
I wish all the best to Dr Nikhil Marwah, Professor and Head, Department of Pediatric Dentistry, Mahatma Gandhi Dental College and Hospital, Mahatma Gandhi University of Medical Sciences and Technology, Jaipur, Rajasthan, India, for this book and also future endeavors and hope that this book can be the book of choice for many dental students across India and abroad just like his previous editions.



**ML Swarankar** MD  
Chairman

Mahatma Gandhi University of Medical Sciences and Technology  
Jaipur, Rajasthan, India





## Message

*Textbook of Pediatric Dentistry* by Dr Nikhil Marwah is a real treatise for those looking for a comprehensive updated information and knowledge about this extremely important area of Dental Sciences. It is multi-contributor text and all have been carefully chosen from amongst the best in the field and agreed to contribute. Previous editions have been extremely popular and has been judged the best-selling book in India in the field of pediatric dentistry.

The current edition has been further improved by incorporation of latest information on various aspects with revised and updated new concepts as per the DCI curriculum, more friendly adaptation for students with quick revision options, addition of new chapters, flowcharts and more than 300 illustrations and 600 clinical photographs enriching the text significantly for better understanding by the students. Another significant aspect of the book is its self-explanatory questions and answers on the points to remember at the end of each chapter and newer concepts with incorporation of special notes in separately marked box.

Overall, the fourth edition of *Textbook of Pediatric Dentistry* by Nikhil Marwah is comprehensive in all respects and provides much-needed knowledge and information for the students of dentistry in India and overseas.

Many congratulations to Editorial and Publishing Team lead by Nikhil Marwah, for making this text available for the benefit of students and teachers alike.



### **Mahesh C Misra**

MBBS MS FRCS (Glas) FAMS (India) FACS (USA) FCLS (India) Hon FRCS (Glas)  
DSc (Hon Causa) Hon FRCS (Edin)

President, Mahatma Gandhi University of Medical Science and Technology  
Professor, General and Minimally Invasive Surgery  
Director, Surgical Disciplines  
Mahatma Gandhi Hospital  
Jaipur, Rajasthan, India

Emeritus Professor, Jai Prakash Narayan Apex Trauma Center  
All India Institute of Medical Sciences, New Delhi, India  
ATLS India Chair  
Ex-Director, All India Institute of Medical Sciences, New Delhi, India  
Member, French Academy of Medicine (Elected October 2017)  
IMA Eminent Medical Teacher Award 2016 (In 2017)







## Mahatma Gandhi Dental College and Hospital (A UNIT OF INDIA EDUCATION TRUST)

### Message

The scope and horizon of dentistry is ever expanding and so are the challenges in dental education. Pediatric dental care lays the foundation for good adult oral health. Teaching of pediatric dentistry at the undergraduate level has assumed more importance in the past 3 decades in India. Since pediatric dentistry is an amalgamation of many specialties of dentistry focusing on the child patient, a textbook which incorporates all these elements in a clear and easy-to-understand layout is an asset to the students.

Dr Nikhil Marwah, Professor and Head, Department of Pediatric Dentistry in our University has successfully addressed this need with his three editions of *Textbook of Pediatric Dentistry*. I hope this new updated fourth edition will also be much sought after by the students community and achieve greater success.



**Narendra Padiyar U**

Dean

Faculty of Dental Sciences

Mahatma Gandhi University of Medical Sciences and Technology

Principal, Mahatma Gandhi Dental College and Hospital

Jaipur, Rajasthan, India



# Previews

Pediatric dentistry encompasses knowledge on the concepts and technical and procedural details of treating children along with the understanding of child psychology and its implication in management of child in dental setup. Dr Marwah's book has adequately given students the literature to understand as well as manage the child. Also, the unique feature about the book happens to be the pictures and flowcharts which makes this book as a savior for students during their last-minute revision. I must appreciate Dr Nikhil for concising the concepts in this manner to enable the students to retain topics and represent them well during their examinations. The book has grown from its first edition by inclusion of advances and scientific rationale with respect to important topics like pediatric endodontics, nanodentistry, rotary endodontics and currently used pharmacological behavior management techniques. I congratulate Dr Nikhil Marwah for this new endeavor and hope that the knowledge that he imparts to the students through his book helps them understand the subject well.

**AR Prahakar**

Professor and Head  
Department of Pedodontics  
Bapuji Dental College and Hospital  
Davangere, Karnataka, India

---

I know Dr Nikhil Marwah as an ever enthusiastic and humble learner right from his postgraduate days. He always shared his knowledge and experience through many of his articles and textbooks as he advanced in the profession of pediatric dentistry.

I am happy that Dr Nikhil Marwah is coming up with this new edition updated as per the contemporary literature as well as the curriculum prescribed by the Dental Council of India. It is a student-friendly version with quick revision options such as flowcharts, box marked special notes and new concepts, as well as points to remember and self-explanatory questions at the end of each chapter. I am sure this new edition will attract the attention of the students as the existing chapters are updated and newer chapters such as Nasoalveolar Molding, Revascularization, Silver Diamine Fluoride and Zirconia Crowns were added to increase the scope along with attractive illustrations and clinical pictures.

I wish him all success in this endeavor as well as the future.

**N Sivakumar**

Professor and Head  
Department of Pedodontics  
Narayana Dental College and Hospital  
Nellore, Andhra Pradesh, India

---

I must compliment Dr Nikhil Marwah and all the contributors for their sincere efforts to revise the old edition. Inclusion of various new things, viz. more illustrations, flowcharts, recent studies, self-explanatory questions and points to remember at the end of each chapter, to make this edition more understandable and interesting will place this book in the category of 'best seller' and class apart. I wish this edition an unprecedented success.

**Nikhil Srivastava**

MDS (KGMCL) FICD FDS-RCPS (Glasgow)  
Member, Dental Council of India  
Professor and Head  
Pediatric and Preventive Dentistry  
Principal, Subharti Dental College and Hospital  
Meerut, Uttar Pradesh, India  
Editor-in-Chief, Journal of Clinical Dentistry

---

A child is a pristine form of mankind and the specialty of pediatric and preventive dentistry gives us a privilege to deal with one of the exceptionally unique creations of God. This book by Dr Nikhil Marwah is most contemporary and comprehensive text of its kind which is unique in its content, language, schematic illustrations, flowcharts, tables and clinical photographs. This edition of the textbook now includes Silver Diamine Fluoride (SDF), Zirconia Crowns, Nasoalveolar Molding and Revascularization and also complies with DCI and state university curriculum. I am sure while turning the pages, the readers would enjoy the subject/topics well and gain an in-depth knowledge to build a solid foundation in pediatric dentistry. I congratulate Dr Nikhil Marwah for his incredible efforts while wishing the very best in his all meticulous endeavors. Undoubtedly, his unstinted and arduous effort will be fruitful to the students.

**Inder Kumar Pandit**

Principal and Dean  
Professor and Head  
Department of Pedodontics  
DAV(C) Dental College and Hospital  
Yamunanagar, Haryana, India

---

This edition of the book is now presented with all new updated concepts and formats and is a comprehensive review with well-compiled chapters which are formatted in an easy-to-follow manner. It completely scribes to new prescribed syllabus of DCI and includes current topics like SDF, Nasoalveolar Molding and Revascularization. This edition is even more illustrious with more pictures and flowcharts and studies updated till 2018. Undoubtedly, this onerous effort by Dr Nikhil Marwah will definitely be enlightening for the students. I wish him all the best for his future endeavors and hope this edition also gets great success as the previous editions.

**Neeraj Gugnani**

Professor  
Department of Pedodontics  
DAV(C) Dental College  
Yamunanagar, Haryana, India

---

With pediatric dentistry coming of age, lots of new developments are happening in the field. It opens several novel and exciting fields in diagnosis, treatment planning and treatment options for the pediatric dental patients. Dr Nikhil Marwah's textbook (fourth edition) addresses several recent developments in the specialty which is only the need of the hour. Thus, it is far more illustrative with better pictures and flowcharts, has quick revision options at the end of each chapter and contains updated, latest references. The book contains details of several topics which have only very recently received acceptance in the field of pediatric dentistry such as Zirconia crowns and somehow controversial subject of endodontic regeneration. It is a useful textbook for basic pediatric dentistry which comprehensively covers all current concepts.

**Sandeep Tandon**

Professor and Head  
Department of Pedodontics  
Government Dental College  
Jaipur, Rajasthan, India

---

Dr Marwah's revised edition is a quantum shift from the previous one as it shares updated latest concepts in the practice of pediatric dentistry lucidly explained with illustrations. I am sure, this edition will be an asset to both the undergraduate as well as the postgraduate students and will be a ready reckoner for the private practitioners.

**Sukhdeep Singh**

Happy Teeth  
Dentistry for Children  
Noida, Gautam Budh Nagar, Uttar Pradesh, India

---

The new edition of the book has a broad array of topics covered with pithy explanations, diagrams and illustrations that would definitely help the students/readers in learning and improving their knowledge in pediatric dentistry.

**Anup Panda**

Professor and Head  
Department of Pedodontics  
Ahmedabad Dental College  
Ahmedabad, Gujarat, India

---

This new edition of *Textbook of Pediatric Dentistry* includes all the latest researches according to the requirements of both undergraduates and postgraduates. Very informative, lucid and easy to understand with all the flowcharts and diagrams. I hope this edition will complete all the requirements of students. I congratulate Dr Nikhil Marwah for this new edition and wish him good luck.

**Anuradha Pathak**

Professor and Head  
Government Dental College and Hospital  
Patiala, Punjab, India

---

In the ever growing and evolving age of scientific techniques and technology, it is heartening to see the growth of pediatric dentistry. It is encouraging and satisfying to see that these days, parents and children both, understand the importance of specialized dentistry and demand specialized care. Such a scenario inspires the fraternity to work hard and strive to bring the best education to budding dentists. Dr Nikhil Marwah has been consistently and proactively envisaging such need for advancements in pediatric dentistry and keeps setting a new benchmark with every revision of the *Textbook of Pediatric Dentistry*. In the latest edition, he has also put a greater emphasis on the illustrations, with more and well-organized flowcharts and pictures, for an impressionable learning experience. The most interesting thing, from a student's perspective, both undergraduates and postgraduates, is the self-explanatory questions and points to remember at the end of the chapter. This edition is a thoroughly refreshing advancement to the previous edition and I am sure that it will be of greatest help to not only pediatric dentistry students but to all students of dentistry. My heartfelt congratulations to Dr Marwah, for putting in such great efforts, for making learning of pediatric dentistry easier and rewarding for students and faculties, across and beyond India.

**Hind Pal Bhatia**

Professor and Head  
Department of Pedodontics and Preventive Dentistry  
Manav Rachna Dental College  
Faridabad, Haryana, India

---

The fourth edition of the *Textbook of Pediatric Dentistry* by Dr Nikhil Marwah is a commendable effort for easy explanation of the subject for the present-day students with advanced quick revision options. The new chapters in the textbook will go a long way in updating the existing knowledge in the field of pediatric dentistry. The many illustrations in the book will help the students to remember the important points of each chapter and reproduce in examinations in a precise way. The highlighting of the latest concepts and the clinical photographs will guide the students to meticulously diagnose and treat the child patients in a clinical situation. I deeply appreciate and congratulate Dr Nikhil for his sincere accomplishment.

**Sundeep Hegde K**

Professor  
Department of Pedodontics  
Yenepoya Dental College  
Mangaluru, Karnataka, India

---

The advancements in technology and accepted practice norms have dramatically changed our approach to patient care over the past few decades. Pediatric dentistry is also refining with each passing year. The fourth edition of the *Textbook of Pediatric Dentistry* by Dr Nikhil Marwah is an excellent compilation of text for comprehensive pediatric dentistry

teaching of students. The new edition has not only polished all the merits of the previous edition but has also come up with newer updates in the field in its attractive format. I congratulate all the contributors for their excellent efforts and wish them success in their endeavor.

**Seema Thakur**

Professor and Head  
Himachal Pradesh Government  
Dental College and Hospital  
Shimla, Himachal Pradesh, India

The important thing in science is not so much to obtain new facts as to discover new ways of thinking about them. This statement is very much applicable in this book by Dr Nikhil Marwah which has reached the zenith, in the respective field of science. Dr Nikhil Marwah is a young and dynamic person with leadership qualities, who believes in achieving his goal through hard work. This book is a mirror of his capabilities. As we all know, pediatric dentistry is comprehensive specialty which includes all the aspects of dentistry. Any textbook written on this subject should meticulously cover all the topics including behavioral science. This textbook in particular goes a long way in addressing all those aspects. As claimed by the author this textbook now includes the hot topics of the current scenario with colorful illustrations. Furthermore, students will be benefited by the self-explanatory questions and answers. We have witnessed the escalation of the standards of the text and illustrations through the editions which has made it a book which can be recommended both for undergraduates and postgraduates who can benefit thoroughly by enhancing their basic, clinical and current knowledge to emerge as an updated pediatric dentist. My heartfelt congratulations to the author and best wishes for all his future endeavors.

**Seema Chaudhary**

Professor and Head  
Department of Pediatric Dentistry  
Kothiwal Dental College and Research Center  
Moradabad, Uttar Pradesh, India

The fourth edition of *Textbook of Pediatric Dentistry* is one of the must-have reference books for the undergraduate and postgraduate students. The textbook has comprehensively covered various aspects of pediatric dentistry. With inclusion of new chapter like Silver Diamine Fluoride, Zirconia, Presurgical Nasoalveolar Molding, Revascularization, etc. Dr Nikhil and his team has updated this edition to near perfection. All the existing chapters are scrupulously modernized with newer concepts. I congratulate the authors and contributors for making this edition more student friendly by incorporating self-explanatory questions and points to remember at the end of chapters. The authors have done a herculean task of presenting more than 300 illustrations and 600 clinical cases for student's benefit. I wish this edition will have remarkable success as seen in previous editions.

**Srirang Sevekar**

Professor and Head  
Department of Pedodontics  
MGM Dental College and Hospital  
Navi Mumbai, Maharashtra, India

Nikhil Marwah's *Textbook of Pediatric Dentistry* has made a significant contribution to the subject. It has been a useful and valuable resource for both the students and teachers. Reader-friendliness, attractive illustrations and succinctness are the main features of the textbook. This book has been a choice of undergraduate students in India; however, I have no hesitation in recommending it to the postgraduates. Additionally, I also advocate it for general dental practitioners who wish to upgrade their knowledge of pediatric dentistry. I have been grateful to Dr Marwah for asking me to contribute to all of its editions. On a personal note, it has given me recognition for my work as well as satisfaction.

**Ashwin M Jawdekar**

MDS (Pediatric Dentistry) MSc DDPH (Dental Public Health, London)  
PGD (Hospital Administration) PG Cert (Dental Practice Management)  
UK Fellow (MFS Orthodontics UDV Andorra)  
Global Ambassador, Global Child Dental Fund (UK)

Professor and Head, Department of Pediatric and Preventive Dentistry  
Dr GD Pol Foundation's YMT Dental College and Hospital, Navi Mumbai, Maharashtra, India

Pediatric dentistry has evolved over the years to become a branch of dentistry, which not just treats dental problems in children but also shapes a child into an individual responsible towards his future oral health. In order to facilitate this process, extensive knowledge is required for the practice of pediatric dentistry. Although there are tomes of pages on the subject, the information often does not translate into real-life scenarios. By Dr Nikhil Marwah's book addresses the need for a comprehensive textbook on the subject of pediatric dentistry. This book provides a valuable window into the world of pediatric dentistry in simplistic language with self-explanatory illustrations and clinical photographs. The effort and research put in by the authors makes it a useful and efficient reference for students.

**Gyanendra Kumar**

Secretary SAAPD

Professor

Department of Pedodontics

Maulana Azad Institute of Dental Sciences

Delhi, India

---

This new edition by Dr Nikhil Marwah is an excellent resource for undergraduate students and now with the addition of new topics can be good source of introduction to various topics for both postgraduates and practitioners of both pediatric and general dentistry.

**Mandeep Singh**

Principal, Professor and Head

Department of Pedodontics

PDM Dental College

Bahadurgarh, Haryana, India

---

I have gone through the *Textbook of Pediatric Dentistry* edited by Dr Nikhil Marwah. This book illustrates almost all aspects of pediatric dentistry in a comprehensive manner and with scientific background. Pictures radiographs and flowcharts make the chapters better understandable with concrete concepts. Updating this textbook with new chapters, concepts and techniques in its upcoming edition will certainly be more useful both for students and faculties.

**Brahmananda Dutta**

Professor and Head

Department of Pedodontics

Kalinga Institute of Dental Sciences

Bhubaneswar, Odisha, India

---

Pedodontics is a vast field which deals with the overall dental health of children. The fourth edition of the *Textbook of Pediatric Dentistry* by Dr Nikhil Marwah includes the topics which are in accordance with the syllabus prescribed by Dental Council of India. The author has made commendable efforts to include the latest topics like SDF, Nasoalveolar Molding, Revascularization and Zirconia Crowns. I also admire the attempt to include numerous flowcharts, illustrations and self-assessment questions which will be easy for undergraduate students to understand and grasp. I strongly recommend this book to all students which will help them understand pediatric dentistry with more scientific and practical approach. My heartiest congratulations to Dr Nikhil Marwah on his tremendous efforts and wishing him the very best in his future endeavors.

**Ruchi Arora**

Professor and Head

Department of Pedodontics

Darshan Dental College and Hospital

Udaipur, Rajasthan, India

---



This revised edition of the *Textbook of Pediatric Dentistry* will prove useful to both undergraduate and postgraduate students in pedodontics. Newer materials and handling tips have been included and updated as a user-friendly version.

**Sham S Bhat**  
Vice-Principal  
Professor and Head  
Department of Pedodontics  
Yenepoya Dental College  
Mangaluru, Karnataka, India

---

The fourth edition of the *Textbook of Pediatric Dentistry* is student friendly with more illustrations and clinical photographs than the previous versions. It has been revised, updated with new chapters on Zirconia Crowns, Silver Diamine Fluoride and Revascularization. The self-explanatory questions, points to remember and quick revision options add color to the book. Information from research articles updated till 2018 could be a boon to postgraduate students. In short, this book is comprehensive and smart.

**Sharath Asokan**  
MDS PhD  
Professor and Head  
Department of Pediatric Dentistry  
KSR Institute of Dental Science and Research  
Tiruchengode, Tamil Nadu, India

---

Pediatric dentistry is fast evolving as a specialty for the pediatric population with tender love and care. The rapid progress has left behind the concepts and techniques of yesteryears, increasing the demand for upgradation of the existing editions. The latest edition of the *Textbook of Pediatric Dentistry* by Dr Nikhil Marwah is a step forward in this direction. I have seen the progressive growth in his book right through its first edition and I am sure addition of new chapters on newer topics with explicit clinical expertise would impart inimitable knowledge to the readers. I am confident that students will definitely be benefitted as the contents are easy to understand and grasp with illustrations and clinical pictures in a new attractive student-friendly format as per the new DCI curriculum. Undoubtedly, this arduous effort of the editor would augment the existing popularity of the book. My best wishes are with him.

**Binita Srivastava**  
Professor and Head  
Department of Pedodontics  
Santosh Dental College  
Ghaziabad, Uttar Pradesh, India

---

The *Textbook of Pediatric Dentistry* by my friend Dr Nikhil Marwah has always given a buoyant experience to me. It is a great compilation which includes most of the important topics and concepts pertaining to undergraduate and postgraduate students. His efforts to add the latest materials and techniques has made the fourth edition more beneficial for the students as well as practitioners.

**Anshula Deshpande**  
Professor  
Department of Pedodontics  
KM Shah Dental College  
Vadodara, Gujarat, India

---

Dr Nikhil Marwah's book would be a good updated reference tool for budding pediatric dentists as it evidences updated guidelines and practical approach to pediatric dentistry clinical practice.

**Shalini Garg**  
Professor and Head  
Sudha Rustagi College of Dental Sciences and Research  
Faridabad, Haryana, India

---

# Preface to the Fourth Edition

The most difficult task in this world is to improve upon goodness; however, luckily, in case of scientific literature we can always improve and provide new advancements. The revision of this book has taken almost a year and the reason was that although we wanted to add new literature but did not want the volume to go beyond a certain dimension that it defies readability. We have taken careful measures to that purview so that the readers can enjoy with the same enthusiasm.

Every new edition of a textbook has some things that are different from previous one yet maintaining the essence similarity. We have updated most figures and added more clinical pictures along with best possible updated concepts to give the reader a lucid view of the subject. Most of the clinical pictures are also updated and new design of presentation has been prepared for the reader. The research studies have been updated till 2018 to give the students a more comprehensive options. In addition to the matters in the existing chapters, we have also added new chapters like Silver Diamine Fluoride, Zirconia Crowns, General Anesthesia in Pediatric Dentistry, Nasoalveolar Molding, Concept of Regeneration and Revascularization to add to the new impactful trends of pediatric dentistry to help the students and clinicians.

The new compilation is a effort to help all undergraduates, postgraduates and clinicians to understand the subject in an elaborate manner and to spread the knowledge of pediatric dentistry throughout the world. I hope we will continue to enjoy the same patronage and blessings from all faculty members and students across the globe and an even larger response to the fourth edition of *Textbook of Pediatric Dentistry*.

**Nikhil Marwah**



# Preface to the First Edition

The curiosity I developed about the subject came out of my interest in search of precise text for pediatric dentistry. During the days of my graduation, I often found that it was difficult to understand and comprehend this text as no book with adequate information was available and I had to go through many books to satisfy my queries as the information in one book was either too less or too much. It was this time that a budding idea of writing this book struck my mind. But, I had to wait for many years to accomplish this, so as to have a complete knowledge and understanding of this vast subject. Many a times during writing this book, my patience would snap and thoughts that I will not be able to complete this task would often cross my mind. But, the quest for knowledge and the desire to share it with others propelled me to complete one of the exclusive books for undergraduates in the subject of pedodontics.

There is a well-known concept that it is always difficult to hit a moving target than a stationary one, this analogy seems appropriate for pedodontists who are dealing with growing children. Such practice involves comprehensive treatment of the child emanating from birth to adulthood and encompasses a wide-range of treatment modalities, ranging from preventive treatment replacement therapy.

This book comprises of 31 chapters that have been uniformly divided into various sections. The first section explains the basics as applied to pedodontics such as the concepts of growth and nutrition. The second section helps in understanding and management of child in a dental clinic. The third section comprises of clinical pediatric dentistry that includes preventive and restorative protocol. The fourth section includes the conglomeration of orthodontics and pedodontics whereas the fifth section explains the effects of external or internal environment on oral tissues. The treatment and management of physically, mentally or medically compromised patients is covered in the sixth section. The last section includes some small but very informative topics like lasers, forensic pedodontics.

“I hear, I forget, I see, I learn.” The human mind is brilliantly capable of remembering things that it visualizes and keeping this in mind we have tried to illustrate concepts with some of the best dental photographs that range from those commonly seen in clinical practice to may exceedingly rare conditions.

*Textbook of Pediatric Dentistry* especially takes note of the recently added concepts and maximum care has been taken to update this information for the readers. Some of the newly and exclusively added chapters include Lasers, Early Childhood Caries, Diet and Nutrition, Stainless Steel Crowns, Temporomandibular Joint (TMJ) Disorders, Pit and Fissure Sealant, Atraumatic Restorative Treatment (ART), Vaccination Schedule and Recently Prescribed American Academy of Pediatric Dentistry (AAPD) Guidelines.

The purpose of the book is many fold but in general it provides an organizational structure from which every student can learn about the concepts and complexity of this truly vast but astonishing subject.

**Nikhil Marwah**



# Special Thanks



To my parents and family  
for their blessing

---



To my guardian angels  
Kanupriya, Aayushman and Ayaan  
who form the essence of my existence

---

# Acknowledgments

I most humbly would like to acknowledge the help rendered to me by all my teachers, seniors, colleagues and friends in compilation of the fourth edition of *Textbook of Pediatric Dentistry*.

First and foremost, I would like to thank the Almighty God and my family, who have been my constant source of support, encouragement and motivation during all the phases of completion of the textbook.

I would like to express my sincere thanks and gratitude to all the contributors of this book for sharing their immense knowledge with me at various stages and helping me compile the book.

I thank Dr ML Swarankar (Chairman, India Education Trust), Dr MC Misra (Vice-Chancellor, Mahatma Gandhi University of Medical Sciences and Technology, Jaipur, Rajasthan, India), Dr Sudhir Sachdeva (Pro-Vice-Chancellor, Mahatma Gandhi University of Medical Sciences and Technology, Jaipur), Dr RR Soni (Managing Trustee, India Education Trust), and Dr Narendra Padiyar (Principal, Mahatma Gandhi Dental College and Hospital, Jaipur), for providing me with a congenial environment and adequate academic support to revise the textbook.

The compilation and revision of this textbook would not have been complete without the efforts of who spent enormous time trying to add the best possible literature into the textbook. I appreciate their advice from the conceptualization of the revised edition to the contributions in the textbook at various stages. My academic team for this revised edition is Satish V, Dr Ravi GR, and my team of postgraduates—Neha, Pooja, Vijay, Swati and Yogita.

I would like to whole heartedly thank my teachers and senior faculty members, who have taken time from their busy schedule not only to contribute academically to the book but also preview the book in such a short span of time.

My sincere thanks to Shri Jitendar P Vij (Group Chairman), Mr Ankit Vij (Managing Director), Ms Ritu Sharma (Director-Content Strategy), Ms Pooja Bhandari (Production Head), Ms Sunita Katla (Executive Assistant to Group Chairman and Publishing Manager), Ms Samina Khan (Executive Assistant to Director-Content Strategy), Dr Nidhi Sinha (Development Editor), Ms Seema Dogra (Cover Visualizer), Mr Deepak Saxena and Mr Deep Kumar (Typesetters), Mr Binay Kumar (Proofreader), Mr Manoj Pahuja (Graphic Designer) and staff of M/s Jaypee Brothers Medical Publishers (P) Ltd, New Delhi, India, for bearing my constant queries and allowing me literary independence in the completion of this project.

# Contents

## Section 1: Introduction to Pediatric Dentistry

- |  |    |
|--|----|
| 1. Introduction                                    | 3  |
| 2. First Dental Visit                              | 11 |
| 3. Dental Home: A Primary Care Oral Health Concept | 17 |
| 4. Pedodontic Clinic                               | 21 |
| 5. Practice Management                             | 27 |

## Section 2: Diagnosis in Pediatric Dentistry

- |   |    |
|---|----|
| 6. Oral Examination and Diagnosis             | 45 |
| 7. Teeth Identification and Numbering Systems | 56 |
| 8. Radiographic Techniques                    | 64 |
| 9. Digital Radiographic Diagnosis             | 81 |

## Section 3: Growth and Development

- |  |     |
|--|-----|
| 10. Developmental Milestones in Children                   | 91  |
| 11. Theories of Growth                                     | 106 |
| 12. Prenatal and Postnatal Development of Head and Face    | 112 |
| 13. Principles, Assessment, and Factors Influencing Growth | 123 |

## Section 4: Developmental Aspects of Dentition

- |                                     |     |
|-------------------------------------|-----|
| 14. Tooth Eruption and Shedding     | 141 |
| 15. Teething                        | 152 |
| 16. Development of Occlusion        | 161 |
| 17. Morphology of Primary Dentition | 175 |



**Section 5: Behavioral Pedodontics**

18. Child Psychology	181
19. Fear and Anxiety	197
20. Psychometric Assessment of Dental Fear and Anxiety	203
21. Nonpharmacologic Behavior Management	210
22. Conscious Sedation	234
23. Behavior Management of Differently-abled Child	252

**Section 6: Preventive Pedodontics**

24. Diet and Nutrition	259
25. Diet Counseling for the Prevention of Dental Caries	269
26. Pit and Fissure Sealants	275
27. Plaque Control in Children	290
28. Plaque Control for the Differently-abled Child	309
29. Fluorides	315

**Section 7: Pediatric Orthodontics**

30. Oral Habits	343
31. Cephalometric Diagnosis	363
32. Preventive and Interceptive Orthodontics	375
33. Myofunctional Therapy	388
34. Model Analysis	400
35. Pediatric Space Management	410
36. Serial Extractions	448
37. Components of Removable Orthodontic Appliances	454

**Section 8: Cariology**

38. Dental Caries	465
39. Caries Risk Assessment	489
40. Diagnostic Aids in Dental Caries	499
41. Early Childhood Caries	510
42. Rampant Caries	521
43. Chemomechanical Caries Removal	527

**Section 9: Restorative Dentistry**

44. Pediatric Operative Dentistry	539
45. Commonly Used Restorative Materials in Pediatric Dentistry	556
46. Minimal Intervention	573
47. Atraumatic Restorative Treatments	578
48. Stainless Steel Crowns in Pediatric Dentistry	585
49. Anterior Crowns in Pediatric Dentistry	602

**Section 10: Pediatric Endodontics**

50. Primary Root Canal Morphology	615
51. Pulp and Periapical Diseases	621
52. Diagnostic Pulp Testing	628
53. Endodontic Armamentarium	639
54. Pulp Therapy for Vital Teeth	647
55. Pulp Therapy for Nonvital Teeth	670
56. Rotary Endodontics in Primary Molars	684

**Section 11: Gingiva and Periodontium in Children**

57. Normal Features of Gingiva	699
58. Gingivitis in Children	703
59. Periodontal Diseases in Children	708

**Section 12: Oral Surgical Procedures in Children**

60. Infection Control	721
61. Local Anesthesia	734
62. Pediatric Exodontia	755
63. Traumatic Injuries to Anterior Teeth	765
64. Pediatric Minor Oral Surgery	800
65. Maxillofacial Trauma in Children	808

**Section 13: Hospital Dentistry**

66. Medical Emergencies in Dental Practice	823
67. Cardiopulmonary Resuscitation	833
68. Principles of General Anesthesia	838
69. Pharmacological Considerations in Pediatric Dentistry	847

**Section 14: Dentistry for the Differently-abled Child**

70. Dental Consideration of Differently-abled Child	853
71. Cleft Lip and Palate	875
72. Prosthodontic Management of Pediatric Patient	893

**Section 15: Pediatric Oral Pathology**

73. Developmental Anomalies of Dentition	909
74. Common Orofacial Syndromes in Children	923
75. Common Oral Pathologic Conditions Associated with Pediatric Dentistry	934

**Section 16: Forensic Pedodontics**

76. Child Abuse and Neglect	949
77. Bite Marks	959

**Section 17: Lasers in Pediatric Dentistry**

78. Introduction, Principle and Types of Laser	967
79. Applications and Hazards of Laser	976

**Section 18: Advancements in Pediatric Dentistry**

80. Applications of Nanosciences in Pediatric Dentistry	989
81. Dental Implants in Children	994
82. Zirconia Crowns in Pediatric Dentistry	999
83. Concepts of Revascularization and Pulp Regeneration	1004
84. Silver Diamine Fluoride	1014
85. General Anesthesia in Pediatric Dentistry	1019
86. Presurgical Nasoalveolar Molding in Management of Cleft Lip and Palate	1026

**Section 19: Research Methodology in Pedodontics**

87. Biostatistics in Dentistry	1039
88. Research Methodology	1050
89. Dental Indices	1058
<i>Index</i>	<i>1069</i>

# Introduction to Pediatric Dentistry

---

## SECTION OUTLINE

1. Introduction
2. First Dental Visit
3. Dental Home: A Primary Care Oral Health Concept
4. Pedodontic Clinic
5. Practice Management

This area introduces the reader regarding importance of pediatric dentistry, its society, goals and aims and objectives of pediatric dentistry. It is important to us to know the management of child when he/she comes to the dental clinic for the first time. It also briefs us regarding dental home and its importance. This section also helps to know how to set up a pedodontic clinic to keep the child in a comfortable position until the treatment is completed as well as role of the auxiliaries who help in management of the same.



# Introduction

Nikhil Marwah

## CHAPTER OUTLINE

- ☞ Importance of Primary Teeth
- ☞ Aims and Objectives of Pedodontics
- ☞ Pedodontic Triangle
- ☞ Indian Society of Pedodontics and Preventive Dentistry
- ☞ Scope of Pediatric Dentistry

Pedodontics is the art and science and that branch of dental science, which deals with comprehensive, interceptive oral health in children from childhood to adolescent age particularly and complete health in general. In other words, it is branch of dentistry that includes training of child to accept dentistry, restoring and maintaining primary mixed permanent dentition and applying preventive methods for dental care. The value of pedodontist always depends upon how carefully the child has been managed at a young age and so pedodontist should have a better understanding of the subject.

The word Pedodontics is made of two words, i.e. pedo + dontics. Pedo is derived from Greek word “*pais*” meaning child and “*dontics*” is the study of teeth.

Pedodontics has come a long way from its early days of extraction oriented beginning to the current comprehensive era with the emphasis on diagnosis and treatment planning. There was a time when dental clinics were biased against this specialty and considered it a waste of time and very often clinics displayed “No treatment for children under the age of 14 at this clinic.” Most of the dentists also gave a negative knowledge influence to the parents and the most common excuse that was offered was, “These are milk teeth and fall on their own so treating them would be a waste of time and money.”

As the years passed by, times changed and so did the schedule for the initial appointment for the child. The

dentistry had now progressed significantly and it was thought that 3 years would be a good time for the child to visit the dentist. Recent knowledge in pediatric dentistry has enabled us to realize that age of 3 years is too old to initiate any type of preventive strategy as the disease will have already taken its toll on the teeth and it no longer remains preventive but becomes interceptive pedodontics. Therefore, it was realized that the first visit should be initiated as soon as the first tooth erupts in oral cavity and the preventive educative aspect should start much earlier, by parental counseling.

## DEFINITIONS

**Stewart** 1982 defined *Pediatric Dentistry as the practice and teaching of comprehensive, preventive and therapeutic oral health care of child from birth to adolescence*. It is construed to include care for special patients who demonstrate physical, mental or emotional problems.

**Pinkham:** *Pediatric dentistry is synonymous with dentistry for children. Pediatric dentistry exists because children have dental and orofacial problems. The genesis of dentistry for children unquestionably is allied to dental decay, pulpitis, and the inflammation and pain associated with infected pulpal tissue and suppuration in alveolar bone.*

American Academy of Pediatric Dentistry (1999) defined "Pediatric dentistry as an age defined specialty that provides both primary and comprehensive preventive and therapeutic oral health care for infants and children through adolescence, including those with special health care needs."

## IMPORTANCE OF PRIMARY TEETH

It is very important that primary teeth are kept in place until they are lost naturally. These teeth serve a number of critical functions. Primary teeth:

- ❖ Maintain good nutrition by permitting your child to chew properly
- ❖ Involved in speech development
- ❖ Helps in the eruption of permanent teeth by saving space for them
- ❖ A healthy smile can help children feel good about the way they look to others.

## AIMS AND OBJECTIVES OF PEDODONTICS

- ❖ **Health of a child as a whole:** The pedodontist is a part of the health team concerned with the individuals', that is, total physical, mental and emotional well-being of patient. We must be certain that our effort to improve dental health is always in accordance with the general health of patient
- ❖ **More specifically we are concerned with oral health:** The other aim should be preventing disease. The earliest attempt at prevention is at expectant mother. She should be advised on dental health of her future child. After the child is born, we advise the mother to continue appointments. First dental appointment for a child is usually at 6 months
- ❖ **Early diagnosis and prompt treatment:** Introduce and implement the principles of preventive dentistry from birth so that early diagnosis is initiated. Occlusal guidance and early treatment of developing malocclusion should be done to avoid complications
- ❖ **Restoring the mouth to good health:** During restorative treatment first and foremost necessity is to convince the patient and parent that treatment is worthwhile. Only work of highest technical standards will succeed in primary teeth. However, this must be at the same time being enjoyable and at worst acceptable to patient. If dental treatment is unpleasant then the child will develop resistance and reluctance for further treatment. In order to overcome those problems, early diagnosis leading to proper treatment is required. Regular attendance, sound diagnosis, adequate local analgesia, modern-cutting equipment are important, but these only arrest the essential empathy that the dentist must have toward child

- ❖ **To observe and control the necessary developing dentition of child patient:** A general dentist who sees the child every time is in an excellent position to study his oral development and to intervene himself or refer to a specialist for the necessary treatment
- ❖ **Relief of pain:** As and when necessary bearing in mind patient's total well-being
- ❖ **Increase the knowledge:** Following this, we will produce a service for the child as an individual population which is dentally educated which also leads to elevation of the profession
- ❖ **Instill a positive attitude and behavior:** This not only will help in accomplishing the treatment in a desired manner but also make the child a good dental patient even in adulthood
- ❖ **Restore the lost tooth structure:** To maintain tissue harmony between the hard and soft tissue
- ❖ **Management of special patients:** Managing physically and mentally disabled and medically compromised children in an efficient and orderly manner so as to avoid discomfort to the patient and at the same time avoiding any bias toward the special condition of the children.

## PEDODONTIC TRIANGLE



*Pedodontic triangle was first explained and conceptualized by Wright in 1975 and was later modified by McDonald et al. in 2004.*



The differences between child and adults with respect to treatment have long been emphasized by **Hippocrates** in the 5th century BC and by **Celsius** in 4th century AD.

- ❖ An adult requires a service to be carried out in his mouth and if he is not satisfied he will seek satisfaction elsewhere, whereas the child attends the dental service because he is forced to do so and will have to return even if he does not like the treatment
- ❖ We may expect the adult to put up with unavoidable discomfort; therefore he has the freedom to choose his treatment and can also appreciate the outcome, whereas the child sees no good reason for dentist's attention
- ❖ Child is in dynamic state of growth and development, whereas the adult is in static state
- ❖ Consideration of behavior as an integral part of child oral health care and needs
- ❖ Attention to preventive care rather than rehabilitation.

## Conventional Model

Patient-doctor relation in adults is linear, but in pedodontics, the relation is triangular. This is because in pedodontics, the



parent and the child both are involved and child is at the apex of triangle as he is the focus of attention. This was first elaborated best in the pediatric dentistry treatment triangle given by **Wright** in 1975.<sup>1</sup> Moreover, in Figure 1.1 the arrows indicated that the communication is not only limited to the benefit of the child but is reciprocal in nature.

### Modified Model

As community has become a major part of all components of environment; therefore, recently, a new parameter has also been added, that is, society (Fig. 1.2). This depiction looked complete with the fact that the communication is reciprocal and society came into the center of the triangle indicating that management methods acceptable to society

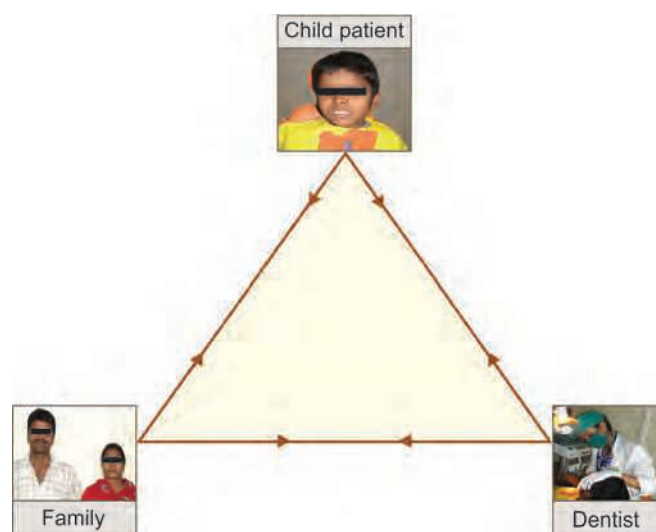


Fig. 1.1: Pedodontic triangle.

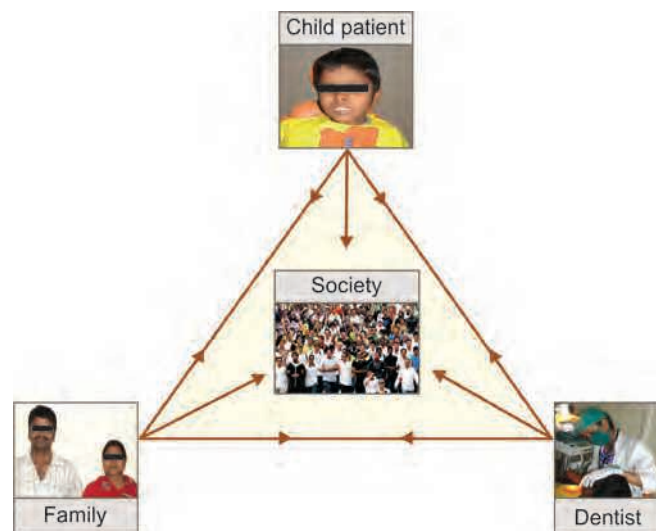


Fig. 1.2: Modified pedodontic triangle.

and the litigiousness of society are important factors influencing treatment modalities.<sup>2</sup>

An authoritative or over indulgent parent always tries to interfere in the conversation between the dentist and the child by answering on behalf of the child. As a consequence, there is more interaction between the parent and the dentist hence the equilateral triangle is replaced by isosceles triangle (Fig. 1.3). On the contrary, if the parent is negligent, then the conversation between the parent and the dentist may not be reciprocal effectively; hence, right-angled triangle replaces the normal equilateral triangle (Fig. 1.4).

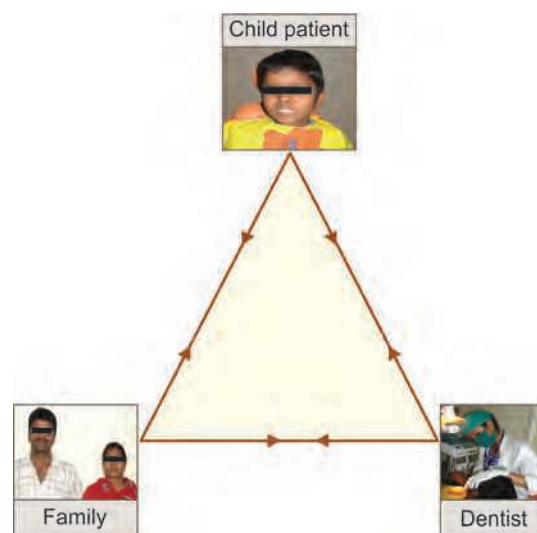


Fig. 1.3: Isosceles triangle—authoritative parent.

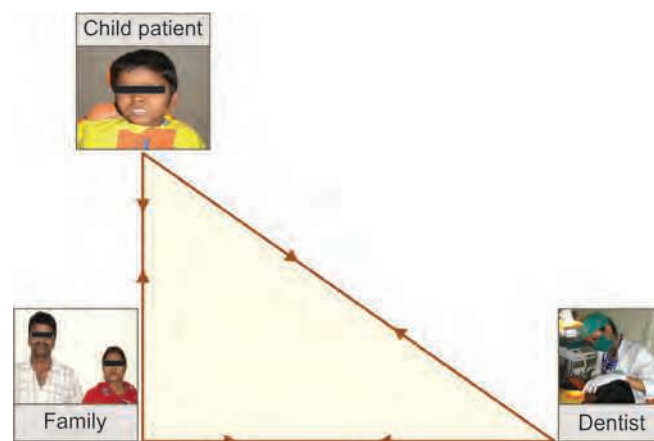
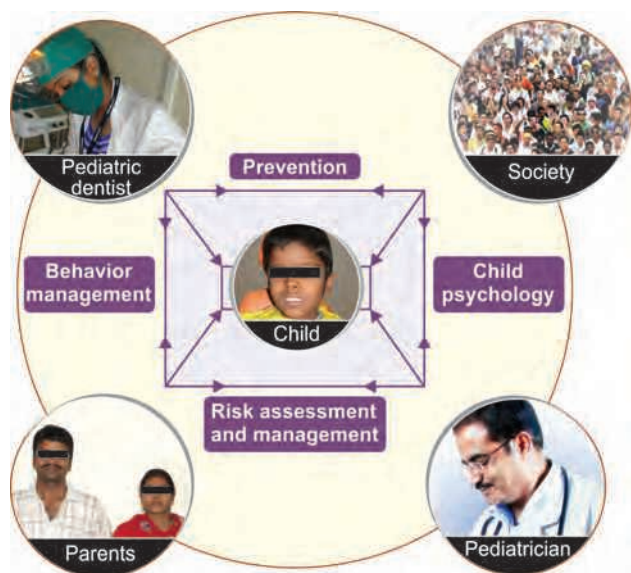


Fig. 1.4: Right angle triangle—neglecting parent.

### Pediatric Dentistry Treatment Model

Pediatric dentistry is an amalgamation of all the branches of dentistry and most of its components have been either derived from or associated with other dentistry branches, but the four principles that stand out in this specialty are prevention, risk assessment and management, child



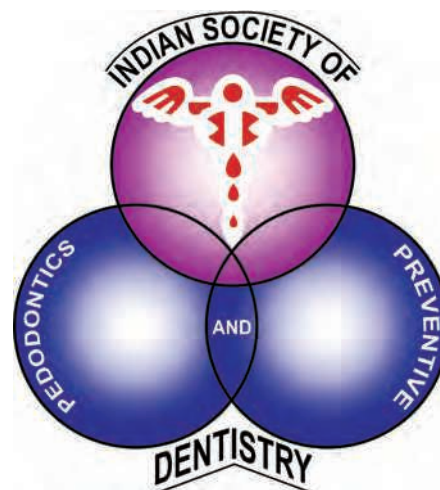
**Fig. 1.5:** Pediatric dentistry treatment model given by Padmanabhan et al.

psychology and behavior management. **Padmanabhan et al.** have proposed a new model based on the pedodontic triangle and have termed it pediatric dentistry treatment model.<sup>3</sup> It presents the former triangle as a square which has the pediatric dentist, pediatrician, family and society playing important roles and definitely the child patient is the center of attention (Fig. 1.5).

## INDIAN SOCIETY OF PEDODONTICS AND PREVENTIVE DENTISTRY

Indian Society of Pedodontics and Preventive Dentistry (ISPPD) is the national society specifically concerned with the oral health of children in India. It aims to improve oral health in children and encourage the highest standards of clinical care. The ISPPD has over 1000 life members from university and hospital pediatric dental departments, pediatric dental practice and general dental practice. The emblem (Fig. 1.6) is based on the famous triad of **Keyes** (1960). One circle represents the tooth, the other the bacteria and the third diet. The shaded area of intersection of the circles represents dental caries. The stress given is that for caries to develop all the three factors are essential; caries cannot occur if one factor is missing. Incidentally, this area of intersection of circles takes the form of triangles. The triangle denotes two aspects (1) it represents delta, which is the sign of dentistry, (2) it depicts the pedodontic triangle as given by **Wright**.<sup>1</sup>

The three corners of triangles are indicative of (1) child, (2) mother (parent) and (3) dentist. This triangle represents



**Fig. 1.6:** Logo of ISPPD.  
(ISPPD, Indian Society of Pedodontics and Preventive Dentistry)

1:2 transactions for the management of children. The top circle of keys in the emblem carries symbols of the emblem of the Indian Dental Association (IDA)—Staff of Aesculapius with wings of serpents encircling around it. The Staff of Aesculapius stands of captor of authority and represents the professional authority of association. The serpents show the power of healing since serpents ages back have been used for healing. Hippocrates adopted this symbol and we have adopted it with two serpents entwined around the staff in opposite directions. The wings on the staff represent the spread of knowledge. The wings have six small and three large divisions as in the IDA emblem.

## Attitudes of Pedodontist

- ❖ Develop an attitude to adopt ethical principles in all aspects of pedodontic practice
- ❖ Professional honesty and integrity are to be fostered
- ❖ Treatment care is to be delivered irrespective of the social status, cast, creed and religion of the patients
- ❖ Willingness to share the knowledge and clinical experience with professional colleagues
- ❖ Willingness to adopt, after a critical assessment, new methods and techniques of pedodontics management developed from time to time, based on scientific researches, which are in the best interest of the child patient
- ❖ Respect child patient's rights and privileges, including child patient's right to information and right to seek a second opinion
- ❖ Develop an attitude to seek opinion from allied medical and dental specialties, as and when required.

## Aims and Objectives of ISPPD

- ❖ The society is formed on the firm belief that “Every child in India has a fundamental right to total dental health.” Every member of the dental profession in general and pedodontists in particular have an obligation to uphold this right
- ❖ The society shall have the solemn responsibility toward the maintenance of positive dental health of the children through prevention, involvement of the community and through other necessary measures to achieve this objective
- ❖ The society shall make an endeavor to provide suitable medium for honoring the commitment it has so sacredly undertaken
- ❖ The society shall be responsible for improvement of education, research and delivery of dental health care in the field pedodontics and preventive dentistry and shall extend cooperation or collaborate with any person, persons or organizations; national or international with similar ideas, ideals and objectives.

*To realize and attain above-mentioned goals the society may:*

- ❖ conduct dental health education programs in schools and in community for the promotion of better oral hygiene, better dental health awareness and prevention of dental diseases
- ❖ Establish liaison with dental surgeons in general practice to carry the message of the society to term and also to keep them in contact with the new, relevant and advanced knowledge in the field through continuing education programs
- ❖ To provide forum for the dental teachers to communicate and exchange knowledge on the current and recent advances in pedodontics and preventive dentistry
- ❖ Hold periodical meetings and conferences of the members of society
- ❖ Organize courses on new techniques in the field of pedodontics and preventive dentistry for pedodontists and other members of dental profession who would be interested to join such courses
- ❖ To promote the publications of scientific literature including a journal of the society, which would be dynamic in character and shall have the possibility to adapt itself to the needs of the society from time to time. The publications shall not only be scientific in nature but shall also undertake publicity and propaganda as per the needs of the society and the community
- ❖ Establish rapport with Dental Council of India, union and state governments and other national and international apex bodies to advise on the various aspects of pedodontics and preventive dentistry including legislative and administrative areas

- ❖ Accept endowments and grants from individuals or societies, official or nonofficial, governmental or non-governmental, national or international
- ❖ Make efforts to improve the basic curriculum of pedodontics and preventive dentistry both at the undergraduate and postgraduate levels
- ❖ Establish liaison with associations and societies of other allied sciences like pediatrics, psychiatry, psychology and basic sciences like biochemistry, microbiology and pathology
- ❖ Encourage research in the specialty of pedodontics and preventive dentistry and other related sciences by the establishment of scholarships, prizes and rewards, by publishing from time to time monographs embodying the results of the research conducted by members independently or under the auspicious of the society
- ❖ Consider and express its views on all matters pertaining to public dental health, dental profession and dental education and take such steps from time to time as shall be deemed necessary
- ❖ To collect, manage and disburse funds for all or any of the objects of the society
- ❖ Do all such things and matters as are conducive to the attainment of the above objectives or any one of them which are subsidiary to the said objectives.

*The Indian Society of Pedodontics and Preventive Dentistry has been formed on the firm belief that “Every child has a fundamental right to his total oral health.”*

## SCOPE OF PEDIATRIC DENTISTRY

Pedodontics encompasses a variety of disciplines, techniques, procedures and skills that logically share a common basis with other specialties but are modified, transformed or adapted to the special needs of children and adolescence and those with special health care needs.

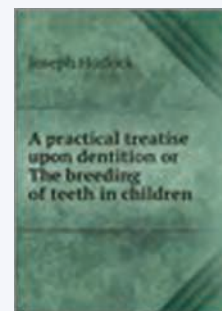
Pedodontic dentistry concentrates on the integration of appropriate didactic and clinical knowledge from various specialties into a framework of quality oral health care for children. It deals with parents in their formative years, exhibiting rapid growth and development. Therefore, a pedodontist is in an excellent position to alter the growth pattern and resistance of oral tissues to diseases.

Pediatric dentists have extended services to fulfill the needs of the special child including the physically, mentally and medically handicapped. They also have the good fortune of being important team member in the children's hospital and in the management of cleft lip and palate patients and other such ailments.

Therefore, the scope of pediatric dentistry virtually includes the essence of all branches of dentistry like diagnosis, oral surgery, rehabilitation, endodontics, orthodontics, preventive dentistry and also includes the new era venues like lasers and nanodentistry.

## WORLDWIDE HISTORY OF PEDODONTICS

- 1800 BC—Ancient Egypt:** No caries in children's teeth
- 1563-64—Eustachius:** Described and showed illustrations of both primary and permanent dentition
- 1737—Gerauldy:** Writes about theories regarding tooth eruption and exfoliation
- 1763—Joseph Hurlock:** Publishes book on children's dentistry
- 1764—Robert Bunon:** "Father of Pedodontics" reiterates the importance of deciduous dentition
- 1865—**First child dental clinic opened at Strasburg, Germany
- 1877—Ottofy:** Became the first person in the history of dentistry to make a thorough dental examination of school children
- 1924—Book:** First textbook of pedodontics was written
- 1926—Detroit Pedodontics Study Club:** Dr Samuel D Harris Father of Children's Dentistry organizations worldwide, starts the Detroit Pedodontics Study Club
- 1927—AAPDC:** Detroit Study Club is now named the American Academy for Promotion of Dentistry for Children
- 1935—Pedodontic course:** 6 undergraduates and 8 postgraduate courses in pedodontics were started
- 1940—ASDC:** American Academy for Promotion of Dentistry for Children renamed as the American Society of Dentistry for Children
- 1947—AAP:** American Academy of Pedodontics was founded
- 1967—CDH:** First International symposium on child dental health conducted by British Pedodontic Society at the London Hospital Medical College
- 1969—IADC:** International Association of Dentistry for Children was established and conducted its first Congress in Sienna, Italy
- 1969—Journal:** Concept of an IADC Newsletter and Journal of the International Association of Dentistry for Children
- 1970—Journal of the IADC:** The first issue was published in September with Theodore C Levitas as editor and the first article published was "Correlation between clinical and histological indications for pulpotomy of deciduous teeth" by Goran Koch and Hilding Nyborg (Sweden)
- 1984—AAPD:** American Academy of Pedodontics was renamed as the American Academy of Pediatric Dentistry
- 1993—IAPD:** First Congress of International Association of Pediatric Dentistry, Chicago, USA



First book on children dentistry



Samuel D Harris

## EVOLUTION OF PEDODONTICS IN INDIA

- 1920—Calcutta Dental College and Hospital:** 1st Dental College started by Dr Rafuuddin Ahmed
- 1920—LDSC:** Introduced as a 1-year course "Licentiate in Dental Science"
- 1926—**Changed into 2-year course
- 1935—BDS:** Licentiate in Dental Science becomes Bachelor in Dental Surgery—4-year course
- 1950—Pedodontics is introduced:** Government Dental College, Amritsar starts pedodontics as a specialty not as an independent specialty (one or two questions in operative dentistry) later—section "B" in orthodontics
- 1978—Pedodontics for undergraduates:** Pedodontics was introduced as a specialty in the undergraduate curriculum
- 1979—Indian Society of Pedodontics and Preventive Dentistry:** The Association of Indian Pedodontists holds the 1st conference. Dr BR Vacher is made the "Father of Pedodontics in India"
- 1982—Affiliated to IADC:** Indian Society of Pedodontics and Preventive Dentistry becomes an affiliate member of IADC (International Academy for Dentistry for Children)



Dr R Ahmed



Dr BR Vacher

## HISTORY OF DENTISTRY

**+100,000 BC:** Homo Mousteriensis shows that prehistoric man had to contend with impacted teeth, the retention of deciduous teeth, caries, fractures and rickets

**3000–525 BC:** Confirmation of Herodotus' statements as to the specialization in medicine in Ancient Egypt that there were individuals who treated only the eye, or teeth, the earliest known dentist being Hesi-Re, Great One (Chief) of the to others and the physicians

**130–201 AD:** Galen, the Prince of Physicians, born in Pergamos was the earliest to mention the nerves of teeth in removing the carious defect, and recommended the file

**1498 AD:** Invention of the modern toothbrush by the Chinese, June 24

**1542 AD:** Ambroise Paré, famous military surgeon, revived the old method of compression of nerve trunks to produce local anesthesia

**1685:** First dental textbook written in English was "Operator for the Teeth" by Charles Allen

**1723:** Pierre Fauchard, a French surgeon publisher. "The Surgeon Dentist," a treatise on teeth

**1790:** Josiah Flagg, a prominent American dentist, constructed the first dental chair made specially for dental patients

**1828:** Dr John M Harris started the world's first dental school in Bainbridge, Ohio

**1833:** The Crawford brothers introduced amalgam in the United States and advertised it as a substitute for gold restorations

**1839:** The American Journal of Dental Science, world's first dental journal, began its publications

**1844:** Horace Wells, a connection dentist, discovered that nitrous oxide can be used as an anesthesia and successfully used it to conduct several extractions in his clinic. In 1845, the public demonstration of the same failed

**1864:** Sanford C Barnum developed the rubber dam which solved the problem of isolating a tooth

**1871:** George F Green received the patent for the first electric dental engine, a self-contained motor and handpiece

**1895:** Wilhelm Conrad Roentgen a German physicist discovered the X-ray

**1899:** Edward Hartley Angle classified the various forms of malocclusion

**1900:** FDI is formed

**1913:** Alfred C Fones opened the Fones clinic for dental hygienists in Bridgeport, Connecticut, the world's first oral hygiene school. Dr Fones uses the term dental hygienist to become known as the Father of Dental Hygiene

**1920:** Dr Ahmed founded the first dental college of India which was financed by starting the New York Soda Fountain in Calcutta

**1931:** Fluoride is identified by HV Churchill in New Kensington, Pennsylvania, Smith MC, Lantz EM, Smith HV in Arizona and Velu H and Balczet L in France

**1933:** The nylon toothbrush made with synthetic bristles was introduced by DuPont

**1948:** Dentist Act was passed by the Indian Parliament in close association with All India Dental Association on the 29th of March. This Act was introduced to regulate the profession of dentistry in India. The Act was amended on July 1, 1955 to make the law applicable to the state of Jammu and Kashmir

**1957:** John Borden introduced a high-speed air driven contra-angle handpiece. The airtor obtains speed up to 300,000 rotations per minute

**1959:** The first electric toothbrush, the Broxodent was introduced by Bristol-Myers company at the centennial of ADA

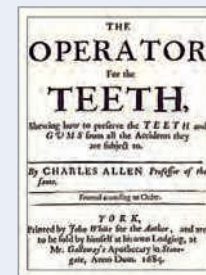
**1960s:** Lasers were developed and approved for soft tissue procedures



Hesi-Re



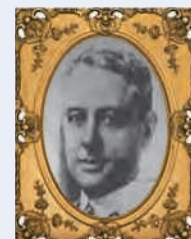
Ambroise Paré



Pierre Fauchard



Wilhelm Roentgen



Alfred C Fones

### Points to Remember

- ❑ Robert Bunon is Father of Pedodontics.
- ❑ BR Vacher is Father of Pedodontics in India.
- ❑ Samuel D Harris is Father of Children's Dentistry organizations.
- ❑ Joseph Hurlock published first book on children's dentistry.
- ❑ Indian Society of Pedodontics and Preventive Dentistry is formed in 1979.
- ❑ American Academy of Pediatric Dentistry (1999) defined "Pediatric dentistry as an age-defined specialty that provides both primary and comprehensive preventive and therapeutic oral health care for infants and children through adolescence, including those with special health care needs"
- ❑ *Patient-doctor relation in pedodontics*: The relation is triangular with the parent and the children; both are involved and child is at the apex of triangle as he is the focus of attention. This was first elaborated best in the pediatric dentistry treatment triangle given by Wright in 1975.

### Questionnaire

1. Define pediatric dentistry.
2. Give a brief history of pediatric dentistry.
3. What are the aims and objectives of pedodontics?
4. Importance of primary teeth in oral cavity.
5. Explain the concept of pedodontic triangle.

### REFERENCES

1. Wright GZ. Behavior Management in Dentistry for Children, 1st ed. Philadelphia, PA: WB Saunders Co; 1975.
2. McDonald RE, Avery DR, Dean JA. Dentistry for the Child and Adolescent, 8th ed. Philadelphia, PA: CV Mosby Co; 2004.
3. Padmanabhan V, Rai K, Hegde AM. Pediatric dentistry treatment triangle—a review and a new model. J Health Sci Res. 2012;3(1):35–6.

### BIBLIOGRAPHY

1. De Civita M, Dobkin PL. Pediatric adherence as a multidimensional and dynamic construct, involving a triadic partnership. J Pediatr Psychol. 2004;29:157–69.

2. Gelbier S. 125 Years of developments in dentistry. Br Dent J. 2005;199:470–3.
3. Gelbier S. History of the International Association of Pediatric Dentistry Part 1: National associations and societies of dentistry for children. Int J Pediatr Dent. 1994;4: 281–7.
4. Gelbier S. History of the International Association of Pediatric Dentistry Part 2: Early events in the USA—the American Society of Dentistry for Children. Int J Pediatr Dent. 1995;5: 213–6.
5. Gelbier S. History of the International Association of Pediatric Dentistry Part 7: The International Forum of Dentistry for Children. Int J Pediatr Dent. 1996;6:289–93.
6. Gelbier S. History of the International Association of Pediatric Dentistry Part 9: Publications of the IADC. J Newsl Int J Pediatr Dent. 1997;7:49–55.
7. Pinkham JR, Casamassimo PS, McTigue DJ, editors. Pediatric Dentistry—Infancy through Adolescence, 4th ed. Saunders; 2008.
8. Suddick RP, Harris NO. Historical perspectives of oral biology: a series. Crit Rev Oral Biol Med. 1990;1:135–51.
9. Wilwerding T. History of dentistry, hosted on the Creighton University School of Dentistry.