



# Clinical Cases in Prosthodontics

**Leila Jahangiri, B.D.S., D.M.D., M.M.Sc.**

Clinical Associate Professor and Chair  
Department of Prosthodontics  
New York University College of Dentistry

**Marjan Moghadam, D.D.S., M.A.**

Clinical Assistant Professor and Director of Pre-doctoral Fixed Prosthodontic Clinics  
Department of Prosthodontics  
New York University College of Dentistry

**Mijin Choi, D.D.S., M.S., F.A.C.P.**

Clinical Associate Professor and Course Director of Advanced Prosthodontics  
Department of Prosthodontics  
New York University College of Dentistry

**Michael Ferguson, D.M.D., C.A.G.S.**

Clinical Associate Professor and Director of Pre-doctoral Fixed Prosthodontic Clinics  
Department of Prosthodontics  
New York University College of Dentistry

 **WILEY-BLACKWELL**

A John Wiley & Sons, Inc., Publication



**Clinical Cases in  
Prosthodontics**





# Clinical Cases in Prosthodontics

**Leila Jahangiri, B.D.S., D.M.D., M.M.Sc.**

Clinical Associate Professor and Chair  
Department of Prosthodontics  
New York University College of Dentistry

**Marjan Moghadam, D.D.S., M.A.**

Clinical Assistant Professor and Director of Pre-doctoral Fixed Prosthodontic Clinics  
Department of Prosthodontics  
New York University College of Dentistry

**Mijin Choi, D.D.S., M.S., F.A.C.P.**

Clinical Associate Professor and Course Director of Advanced Prosthodontics  
Department of Prosthodontics  
New York University College of Dentistry

**Michael Ferguson, D.M.D., C.A.G.S.**

Clinical Associate Professor and Director of Pre-doctoral Fixed Prosthodontic Clinics  
Department of Prosthodontics  
New York University College of Dentistry

 **WILEY-BLACKWELL**

A John Wiley & Sons, Inc., Publication

Edition first published 2011  
© 2011 Blackwell Publishing Ltd.

Blackwell Publishing was acquired by John Wiley & Sons in February 2007. Blackwell's publishing program has been merged with Wiley's global Scientific, Technical, and Medical business to form Wiley-Blackwell.

*Editorial Office*  
2121 State Avenue, Ames, Iowa 50014-8300, USA

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 code for users of the Transactional Reporting Service is ISBN-13: 978-0-8138-1664-7/2011.

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. This publication is designed to provide accurate and authoritative information in regard to the subject matter covered. It is sold on the understanding that the publisher is not engaged in rendering professional services. If professional advice or other expert assistance is required, the services of a competent professional should be sought.

#### DISCLAIMER

The treatments proposed or rendered in the following cases suggest a consensus among the authors and do not necessarily reflect the opinions of the New York University College of Dentistry faculty at large.

#### *Library of Congress Cataloging-in-Publication Data*

Clinical cases in prosthodontics / Leila Jahangiri . . . [et al.].

p. ; cm. – (Clinical cases)

Includes bibliographical references and index.

ISBN 978-0-8138-1664-7 (pbk. : alk. paper)

1. Prosthodontics—Case studies. I. Jahangiri, Leila. II. Series: Clinical cases (Ames, Iowa)

[DNLM: 1. Prosthodontics—methods—Case Reports. 2. Prosthodontics—methods—Problems and Exercises. 3. Oral Surgical Procedures, Preprosthetic—methods—Case Reports. 4. Oral Surgical Procedures, Preprosthetic—methods—Problems and Exercises. WU 18.2 C641 2011]

RK651.C58 2011

617.6'9—dc22

2010020440

A catalog record for this book is available from the U.S. Library of Congress.

Set in 10 on 13 pt Univers Light by Toppan Best-set Premedia Limited  
Printed in Singapore

1 2011

## **Dedication**

To all of our students who challenge us daily and enrich our lives



# CONTENTS

Authors . . . . .	xi
Preface . . . . .	xii
Acknowledgments . . . . .	xiv
Introduction to Evidence-Based Practice (EBP) . . . . .	3
<b>Case 1</b>	<b>9</b>
Treatment of an edentulous patient with conventional complete denture prostheses	
<b>Case 2</b>	<b>15</b>
Treatment of an edentulous patient with two-implant-retained mandibular overdenture	
<b>Case 3</b>	<b>21</b>
Treatment of a patient with combination syndrome	
<b>Case 4</b>	<b>27</b>
Treatment of an edentulous patient with a severely atrophic mandible	
<b>Case 5</b>	<b>33</b>
Management of florid cemento-osseous dysplasia (FCOD)	
<b>Case 6</b>	<b>39</b>
Treatment of a partially edentulous patient with implant-retained removable partial denture prosthesis	
<b>Case 7</b>	<b>45</b>
Treatment of a partially edentulous patient with fixed and removable prostheses	
<b>Case 8</b>	<b>53</b>
Management of ectodermal dysplasia I—overdenture prostheses	

<b>Case 9</b>	<b>59</b>
Management of ectodermal dysplasia II—implant-retained removable prostheses	
<b>Case 10</b>	<b>65</b>
Management of ectodermal dysplasia III—a multidisciplinary approach	
<b>Case 11</b>	<b>73</b>
Management of a fractured central incisor I—mild	
<b>Case 12</b>	<b>79</b>
Management of a fractured central incisor II—moderate	
<b>Case 13</b>	<b>85</b>
Management of a fractured central incisor III—severe	
<b>Case 14</b>	<b>91</b>
Rehabilitation of anterior teeth I—combination of complete and partial coverage restorations	
<b>Case 15</b>	<b>97</b>
Rehabilitation of anterior teeth II—partial coverage restorations	
<b>Case 16</b>	<b>103</b>
Rehabilitation of anterior teeth requiring orthodontic extrusion	
<b>Case 17</b>	<b>109</b>
Management of severe crowding—a multidisciplinary approach	
<b>Case 18</b>	<b>117</b>
Management of a patient with maxillary canine transposition	
<b>Case 19</b>	<b>123</b>
Management of a patient with loss of posterior support	
<b>Case 20</b>	<b>129</b>
Management of the consequences of partial edentulism	
<b>Case 21</b>	<b>137</b>
Management of worn dentition I—resulting from dental malocclusion	
<b>Case 22</b>	<b>145</b>
Management of worn dentition II—localized severe wear	

<b>Case 23</b>	<b>153</b>
Management of worn dentition III—generalized severe wear	
<b>Case 24</b>	<b>159</b>
Implant therapy versus endodontic therapy	
<b>Case 25</b>	<b>165</b>
Management of endodontically treated teeth	
<b>Case 26</b>	<b>173</b>
Prognostic indicators for strategic extractions in a full mouth rehabilitation	
<b>Case 27</b>	<b>179</b>
Treatment of a patient with implant-supported fixed complete denture prostheses	
<b>Case 28</b>	<b>185</b>
Full mouth rehabilitation—implant-supported prostheses I	
<b>Case 29</b>	<b>191</b>
Full mouth rehabilitation—implant-supported prostheses II	
<b>Case 30</b>	<b>199</b>
Full mouth rehabilitation—implant-supported, screw-retained prostheses	
<b>Case 31</b>	<b>205</b>
Full mouth rehabilitation—implant-supported, cementable fixed prostheses	
<b>Case 32</b>	<b>211</b>
Full mouth rehabilitation—combination of implant and tooth-supported fixed prostheses	
<b>Case 33</b>	<b>217</b>
Full mouth rehabilitation—combination of implant and tooth-supported fixed and removable prostheses	
<b>Case 34</b>	<b>223</b>
Management of a patient with bulimia	
<b>Case 35</b>	<b>229</b>
Management of oral manifestations of methamphetamine abuse	

<b>Case 36</b>	<b>235</b>
Management of cleidocranial dysplasia I—treatment of an adolescent patient	
<b>Case 37</b>	<b>241</b>
Management of cleidocranial dysplasia II—treatment of an adult patient	
Index	<b>247</b>

## Authors

**Leila Jahangiri**, B.D.S., D.M.D., M.M.Sc.

Clinical Associate Professor and Chair, Department of Prosthodontics  
New York University College of Dentistry

**Marjan Moghadam**, D.D.S., M.A.

Clinical Assistant Professor and Director of Pre-doctoral Fixed Prosthodontic Clinics  
Department of Prosthodontics  
New York University College of Dentistry

**Mijin Choi**, D.D.S., M.S., F.A.C.P.

Clinical Associate Professor and Course Director of Advanced Prosthodontics  
Department of Prosthodontics  
New York University College of Dentistry

**Michael Ferguson**, D.M.D., C.A.G.S.

Clinical Associate Professor and Director of Pre-doctoral Fixed Prosthodontic Clinics  
Department of Prosthodontics  
New York University College of Dentistry

## Preface

Leila Jahangiri

Two seasoned clinicians are discussing a case. Upon hearing the treatment plan, one clinician says, “I would not have done it that way.” The other clinician responds by explaining the path of treatment based on critical decision-making factors and justifying it with judgment and experience. The argument will get progressively stronger if it is substantiated with the best available evidence at every step in the decision-making process. Many clinicians rely on their observed evidence from years of practice. Although decisions made this way can be valid, the clinicians can augment and enhance their knowledge if they also investigate the literature to see what others have reported in similar cases. This will invariably confirm or, at times, alter what they do. For a practicing clinician, this process is described as *lifelong learning*. The combination of experience with a strong justification based on the best available evidence in the literature shifts the treatment planning process from a purely personal choice (*subjective*) to a collective profession’s choice (*objective*).

The number of case-based books with an emphasis on the discipline of prosthodontics and treatment planning is in short supply. *Clinical Cases in Prosthodontics* uses cases to help students and practitioners focus on a few key elements that become the basis of the decision-making criteria. This book is a unique compilation of scenarios concentrating specifically on *objective* treatment planning. Over the past 15 years that I’ve been teaching prosthodontics, this has been the students’ greatest challenge, one that eventually is met through extensive clinical experience but can be learned from case studies. The purpose of this book is to provide you with greater exposure to clinical cases and illustrate a pathway to decision-making for effective treatments. We define

the treatment plan as a road map, which provides a rational and justified method for determining the patient’s needs and building a pathway to reestablish form, function, and aesthetics. More importantly, effective treatment planning goes beyond the immediate dental needs and addresses the patient as a whole. A complete plan must consider a patient’s medical conditions, risk factors, etiology of any disease, emotions, psychological state, and motivation, as well as any financial constraints. This book is designed with a greater emphasis on the treatment planning *process* rather than on the treatment *rendered*. Ideally, at the time of treatment planning, the clinician should be able to envision the outcome and prognosis.

When the opportunity to write this book arose, our team was determined to focus solely on treatment planning with the critical decision-making process in mind. Our collective experience and our responsibilities as full-time faculty at New York University College of Dentistry have given us access to a vast number of patients presenting with a diversity of needs, leading us to incorporate case-based teaching in our core curriculum. I discussed the style of our case teaching approach with colleagues from other institutions, and they overwhelmingly encouraged me to develop these cases in the format in which they appear today. This book is not intended to be an in-depth explanation of techniques, materials, or procedural steps. You will find that the prosthodontics literature is rich with textbooks on core principles and fundamentals that are successfully being utilized in dental education. Our intention is to provide you with the *application* of such fundamental principles. *Clinical Cases in Prosthodontics* can be used by students, graduate residents, faculty, and clinicians who wish to expand their knowledge of prosthodontics

and forever strive to maintain their practices using evidence-based dentistry.

The cases presented throughout the book vary from simple to complex. There are occasions where we challenge certain traditional concepts in our decision-making criteria, strengthening our approach with new evidence or facts and substantiating our choices with appropriate literature. We encourage you to view treatment planning in a similar manner, as a dynamic, lifelong learning process that is bound to change as the scientific evidence evolves and progresses. The first chapter, "Introduction to Evidence-Based Practice (EBP)," is specifically written to help you in the inquisitive process. This is an effort to stimulate you to question and seek answers for the rest of your practicing life. Although it is expected that, over time, treatment and practice might change, it is hoped that the process of sieving through literature for guidance will remain as a core concept behind sound decision making.

A wide variety of cases are presented, which can be reviewed sequentially or randomly. Each case follows a similar pattern, beginning with a brief "story" of how the patient presents, while identifying the patient's chief complaint or issue. A selection of supporting figures and relevant charts are included to help you in the decision-making process. Carefully selected learning goals and objectives are clearly outlined, and these will assist you in examining the

specific details of the case. Pertinent data is listed, including medical/dental/social history, medications, vital signs, and other significant clinical findings that justify the diagnosis. This information is followed by critical *Clinical Decision-Making Determining Factors* used to support the recommended treatment plan. At the end of the analysis, a series of multiple-choice questions are offered to further your understanding of the goals and objectives. The questions can also be used to test your knowledge and help you develop your decision-making skills. A list of references is given to identify the supporting literature for the concepts discussed. We are not advocating that the treatments presented here are the only ways to address the issues. However, we are justifying the selected paths toward the final decisions based on the currently available scientific data.

An added benefit in reading *Clinical Cases in Prosthodontics* is that national and regional examinations in dentistry and prosthodontics, as well as board certification in prosthodontics, are, in part, based on discussions of cases similar to the ones presented in this book. Your attention to the detailed analysis and treatment planning decisions may help you prepare for these exams.

We hope that this book can set you on a path to discovery and a questioning process that expands your existing knowledge and enhances your patient care capabilities.

## Acknowledgments

We wish to thank our institution, New York University College of Dentistry, for creating an enriching, patient-centered environment from which these cases have been selected. We also express our deepest gratitude to Dr. Farhad Vahidi, Associate Professor and Director of the Jonathan and Maxine Ferencz Advanced Education Program in Prosthodontics. His meticulous efforts in cataloging numerous cases have been instrumental in the development of this book. Sincere thanks go to our faculty, dental students, and residents, past and present, who have allowed us to collectively learn and further our knowledge. A special thank you goes to our colleague Silvia E. Spivakovsky, D.D.S. for her invaluable contribution to the chapter on

evidence-based practice. Most importantly, we truly appreciate the willing cooperation of our patients, who made *Clinical Cases in Prosthodontics* possible. We would like to give additional thanks to all who selflessly contributed their case photographs to the production of this book. A specific acknowledgment is given to the treating clinician at the end of each case.

On a personal note (L.J.), my sincerest appreciation goes to my team of coauthors who brought a great sense of enthusiasm and untiring energy into this project. They offered their time and expertise, and they researched, organized, and edited, making the writing process most enjoyable.

**Clinical Cases in  
Prosthodontics**



# Introduction to Evidence-Based Practice (EBP)

Silvia E. Spivakovsky\* and Leila Jahangiri

Practicing dentistry is about making *informed* clinical decisions in order to deliver the best possible care to patients. In practice, the choice of adopting certain treatment modalities is based on a variety of factors, including education, clinical experience, colleague recommendations, research findings, and patient suggestions.

While there are many sources of available evidence, the process of Evidence-Based Practice (EBP) is fast becoming the standard for practitioners to make informed clinical decisions. EBP is a *scientific method* of gathering systematic research findings as the evidence necessary to select the best course of treatment. The American Dental Association defines EBP as “An approach to oral health care that requires the judicious integration of systematic assessments of clinically relevant scientific evidence, relating to the patient’s oral and medical condition and history, with the dentist’s clinical expertise and the patient’s treatment needs and preferences.”<sup>1</sup>

EBP promotes the collection and interpretation of research-derived evidence to determine or reject a treatment option. The *query and search* process uncovers relevant findings that justify a particular clinical decision and the subsequent delivery of appropriate care. In addition, the EBP process embraces and promotes lifelong learning.

\*Silvia E. Spivakovsky, D.D.S. is a Clinical Associate Professor in the Department of Oral & Maxillofacial Pathology, Radiology & Medicine, at the New York University College of Dentistry. She is a Course Director of *Oral Medicine and Diagnosis* and *Senior Comprehensive Care*.

*Clinical Cases in Prosthodontics*, Leila Jahangiri, Marjan Moghadam, Mijin Choi, and Michael Ferguson, © 2011 Blackwell Publishing Ltd.

It may be impractical for the busy practitioner to utilize EBP for every clinical decision; however, EBP is the most valid method for answering clinical questions, updating knowledge, and understanding the validity of new procedures.

## The PROCESS of Evidence-Based Practice

Scientific evidence is continually evolving and information is readily accessible. The problem with having immediate access to an abundance of data is in managing the volume of that data. In fact, as new information augments or supplants existing data, some traditional sources can become obsolete, leaving the practitioner with the challenge of keeping up with the latest evidence, the application of which allows for the delivery of better care.

Since properly *applied knowledge* directly affects the quality of patient care, EBP is developed to help clinicians evaluate, qualify, and recognize the most *useful* evidence to apply to a given situation.

EBP is a 5-step process, commonly referred to as the FIVE A’s:<sup>2</sup>

1. **ASK** an answerable clinical question
2. **ACQUIRE** the best evidence
3. **APPRAISE** the strength and relevancy of the information
4. **APPLY** the appropriate action
5. **ASSESS** the outcome

This structured approach allows the practitioner to become an effective consumer of *high-quality, relevant, and reliable* information with the purpose of improving the quality of care.

### 1. Ask

To find the best possible answer requires the most suitable question. A good clinical inquiry uses the most

## INTRODUCTION

appropriate words to formulate an *answerable* question related to care. There are methods available to help a practitioner ask the “right” question. One such format used to generate a searchable question is called PICO,<sup>3</sup> and the components of the acronym are

**P:** Population, Patient, or Problem (basically the disease or affliction)

**I:** Intervention (such as a drug, a test, or other procedure)

**C:** Comparison (to another drug, placebo, test, procedure, etc.)

**O:** Outcome (the desired effect)

The PICO format helps identify search terms. Start by combining the most significant patient issue (P in PICO) with the intervention therapy (I in PICO). If there are too many results from that search or there appears to be no answer, then add the comparison intervention (C in PICO) to the search. It is understood that some questions may not have a comparison.

The use of the PICO format forces the inquiring clinician to clarify the components of a question in order to create a path to discovering a meaningful answer and determine the desired outcome (O in PICO). To illustrate this process using EBP, the following PICO is developed for a clinical query.

### THE DOWEL DILEMMA

A practitioner seeks to determine the best type of dowel and core needed to restore a tooth after endodontic therapy, with a minimal coronal tooth structure remaining. The PICO components are as follows:

**P:** Endodontically treated teeth with minimal coronal tooth structure remaining

**I:** Prefabricated dowels

**C:** Cast dowels

**O:** Longevity of the final restoration

From the PICO the searchable question is formed: “What is the best type of dowel and core needed to restore a tooth after endodontic therapy, with a minimal coronal tooth structure remaining?”

### 2. Acquire

To answer the dowel question, the next step is to ACQUIRE information. Potential sources of information include original research studies, systematic reviews, evidence-based journal articles, and other educational literature. The availability and ease of access to information can potentially lead to an overwhelming amount of data that will be difficult to sort.

Table 1

Clinical Question	Best Research Design in Order of Significance
Therapy	Randomized control trial (RCT) > cohort study > case-control study > case series
Diagnosis	Prospective, blind comparison to a reference standard
Etiology or Harm	Cohort study > case-control study > case series
Prognosis	Cohort study > case-control study > case series

Adapted from *Evidence-based Dentistry: Managing Information for Better Practice*.<sup>2</sup>

For example, using the popular search engine Google, the search for the phrase “best post and core in dentistry,” yields over 47,000 results. Although the entries are sequenced in some search-engine hierarchy, arranged by the number of times the phrase is found or repeated, there is no sure way of knowing which search results will lead to the discovery of useful information. Very often, the search process can be “hit and miss,” especially when the search is more general than specific.

Successful use of EBP tools and resources can make the search more effective and less time consuming. One approach is to narrow down the scope of a given question by categorizing it as a *therapy, diagnosis, etiology, harm, or prognosis*. Depending on the assigned category, the following research design options can help in the process of EBP (Table 1).

“Research design” refers to Randomized Control Trials, Cohort Studies, Case-Control Studies, Case Series, and Expert Opinions. Each study design has strengths and limitations due to biases. A *hierarchy* of available information can be developed from a search within a *specific* category (therapy, diagnosis, etiology, harm, or prognosis) to aid in prioritizing the evidence. Many efforts are in place to try to consolidate relevant information into an easy-to-use format. Examples include guidelines, recommendations, and systematic reviews. For a *therapy* question, the hierarchy may look like a pyramid (Fig. 1). The pyramid shape illustrates the magnitude of information available in each tier. The larger the tier, the more information to examine; the smaller the tier, the more relevant the data. Thus, information found in higher tiers may increase the certainty of answering the clinical question.