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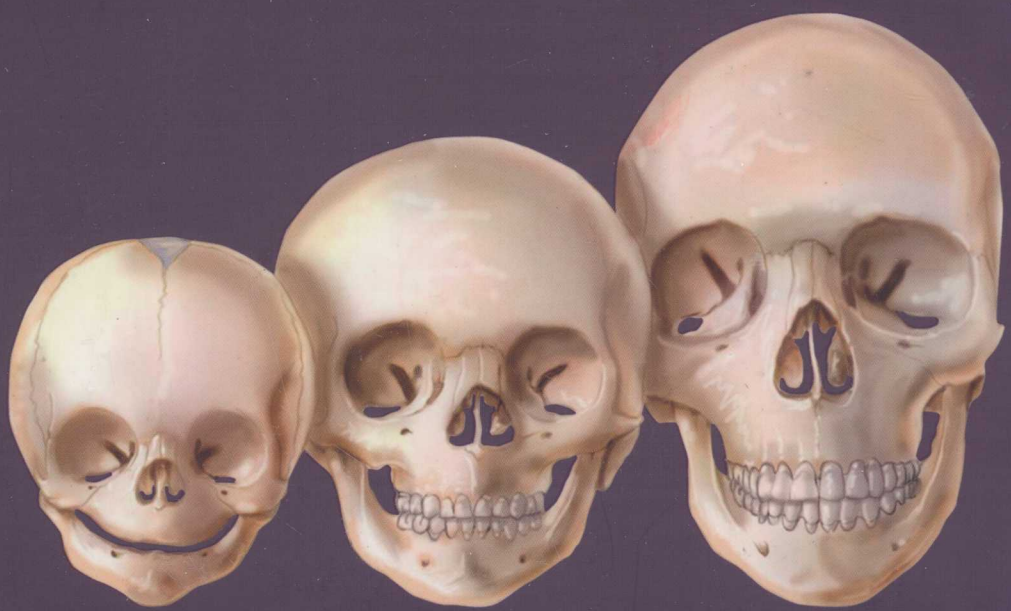
ORAL AND MAXILLOFACIAL SURGERY

Second Edition

Trauma
Surgical Pathology
Temporomandibular Disorders



II

Marciani · Carlson · Braun

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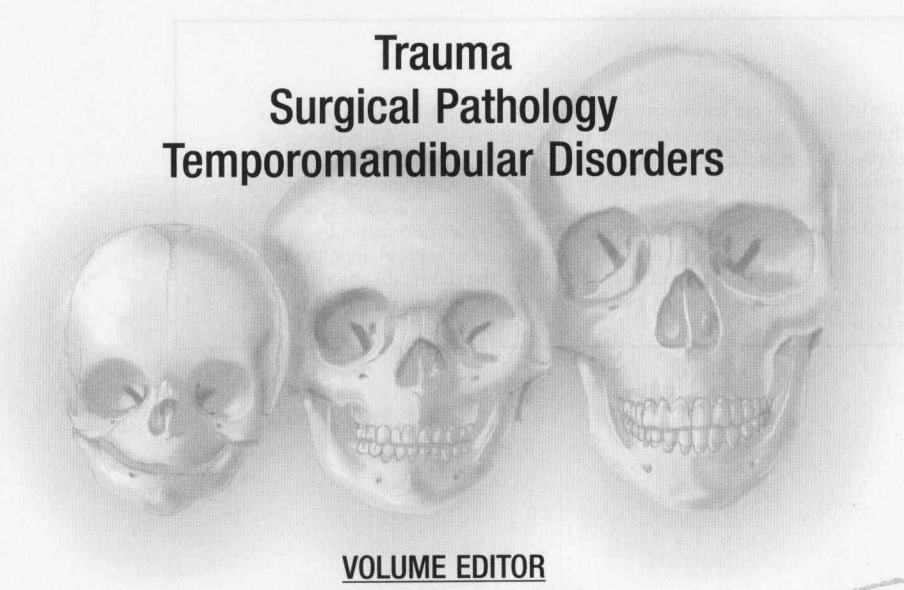

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DEDICATION

To all the oral and maxillofacial surgery residents who have enriched my life.
Robert D. Marciani

I would like to thank my three mentors, Guy A. Catone, DMD; Robert E. Marx, DDS; and John L. Bell, MD, who have fostered and stimulated my interest in oral/head and neck pathology and tumor surgery.
Eric R. Carlson

This work is dedicated to the faculty, residents, and staff of the University of Pittsburgh and University of Pittsburgh Medical Center, Department of Oral and Maxillofacial Surgery.
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FOREWORD

The breadth and scope of this book in three volumes evokes wonderful memories of another era for me. When I first became head of the oral surgery residency program at our institution in 1956, there were *no* guidelines, as we have today, for the educational content or range of surgical procedures to be included in the curriculum. Knowledge and procedures were usually taught at the level of practice in the community. The most worthy surgeon and author at the time was Kurt Thoma, whose two volume second edition of *Oral Surgery*, 1952,[1] comprised of 10 parts that included 47 chapters on contemporary and leading-edge oral surgery, was in every respectable practitioner's library. The book included fresh information relative to everyday office needs and just enough edgy, bold surgery, such as open reductions of fractures and condyles, to make for engrossing reading. There was nothing in that age to even closely rival his monumental and inspirational work. I kept the table of contents of Thoma's book before me at all times. If a surgical procedure or treatment method was included in the book, it became a part of the training of our residents. It *became* our curriculum. And here we have the same attractiveness in Fonseca's, Marciani's, and Turvey's book, which is eerily the same—but, contemporary, with more authors and a far wider scope. There is no merit in comparing the books, which are two generations apart. But the point is, if there were a need to start a new education program in the specialty today with nothing more than this book as a guideline for a curriculum, and the program could deliver education at the level and reach described in the book, the program would be flooded with applicants.

The ambition and organization of this book—covering the full scope of oral and maxillofacial surgery—is remarkable not only for its huge content, but because it introduces a new generation of knowledgeable contributors to the specialty. The book has many known and authoritative colleagues with respected academic affiliations, who are at their best in their writings. However, it is the new breed, largely still in training or private practice with adjunct university positions bringing front-line experience to the pages, that is exciting. We are accustomed to thinking that new advances and scholarship are the provenance of seasoned workers in universities and hospitals. But it is the growing underground of dedicated, amateur scholars still in residency or fellowship training or early in private practice or academia who have discovered that the joy of learning and writing is a big reward for the revelations of their exciting, young work. Even though Fonseca, Barber, Costello, Dembo, Gregg, Jensen, Smith, Marciani, Carlson, Braun, Alpert, Dierks, Ghali, Hudson, Helman, Indresano, McCoy, Mercuri, Ochs, Swift, Williams, Turvey, Waites, Epker, Frost, Guerrero, O'Ryan, Posnick, Prescious, Reyneke, Schendel, Van Sickels, and Wolford are rightfully big attractions of the book, be prepared for fulfillment in reading the work of a host of fresh names, which will soon be well known to you. The editor is commended for bringing this nascent talent to the book.

Beyond surgery, there is a valuable and needed section of the book devoted to practice management with expert coverage of the aggravations, which are a part of current practice. These partially include office management, accreditation of surgicenters, credentialing and hospital privileging, office design, coding, insurance, and third party payers and risk management. There is much to appreciate in this solid address of the business of the specialty.

There is always more to learn in the world of oral and maxillofacial surgery than any of us has time to achieve or do. Today's immense, expanding frontier of knowledge, procedures, and technology pertinent to the specialty is so vast that we now need a lifetime even to penetrate the body of scholarship and skills at hand. These are reasons why an encyclopedia of the kind compiled by Fonseca, with assistance from Marciani and Turvey, is so comforting as an immediate, all-embracing resource to what is current and important to everyone captivated by oral and maxillofacial surgery—or even as an emergency curriculum.

This is a *big* book with an ambitious scope that will appeal to a large readership engaged in oral and maxillofacial surgery. It is not for the person described by Beecher:

> *"If a man has come to that point where he is so content that he says,*
> *'I do not want to know any more,*
> *or do any more or be any more,'*
> *he is in a state in which he ought to be changed into a mummy."*[2]

No one will remotely suggest that the editor of this marvelous book be relegated to that state. He does things—and he does them *well*. He has an amazing and enviable record in the production of excellent, multiple-authored, surgical tomes. He has outdone himself with this one.

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[1]Thoma K: Oral Surgery, ed. 2, St. Louis, 1952, The C.V. Mosby Co.

[2]Beecher HW: in Thoughts on Leadership, The Forbes Leadership Library, Chicago, 1995, Triumph Books, p.17.

PREFACE

It is our privilege to present the second edition of *Oral and Maxillofacial Surgery*. This multiauthored, comprehensive text will be presented in three volumes. The first edition, published in 2000, was well received; but 8 years later, with all the extensive changes in techniques and technology, we felt that a second edition was overdue. Drs. Marciani and Turvey have been brought on board to bring together the best minds to create a contemporary and comprehensive text. They have recruited section editors who have worked tirelessly to ensure that the authors submitted chapters that reflected the state of the art in their area of responsibility.

This book is a comprehensive resource on oral and maxillofacial surgery, examining the full scope of the field, including dentoalveolar surgery, orthognathic surgery, trauma surgery, surgical pathology, temporomandibular joint surgery, dental implantology, cosmetic surgery, cleft and craniofacial surgery, and reconstructive surgery. Every surgical procedure performed by oral and maxillofacial surgeons today is covered in detail. The set's greatest strength is its comprehensive grasp of the subject. This multivolume text provides solid coverage of a wide range of issues related to surgical care, such as anesthesia, diagnostic imaging, treatment planning, rehabilitation, physical therapy, and psychological considerations. We have included additional content in diagnosis, treatment planning, and surgical decision making. There are more than 80 new chapters in three volumes.

Volume I covers anesthesia, dentoalveolar and implant surgery, and office management. Although all sections have new material, the area of implant surgery has undergone the greatest change since the first edition was published. Dr. H. Dexter Barber has recruited an outstanding group of contributors who present current techniques and technology related to this discipline. Drs. John Matheson and Raymond J. Fonseca also elicited contributions from authorities in the other sections of this volume.

Dr. Robert Marciani was in charge of editing Volume II. He recruited Dr. Eric Carlson to oversee the section on surgical pathology and Dr. Thomas Braun to edit the section on the temporomandibular joint. These three individuals recruited top-notch authors who have covered their area of responsibility comprehensively. The chapter on bisphosphonate-related osteonecrosis of the jaws is not only timely, but informative. The diagnosis and management of facial pain is presented in this section and complements Dr. John M. Gregg's chapter in Volume I on chronic maxillomandibular pain, head and neck pain, and TMJ pain. Dr. Marciani has assembled a variety of specialists to cover the complete gamut of maxillofacial and head and neck trauma.

Volume III has been organized by Dr. Timothy Turvey. He recruited Drs. Bernard J. Costello and Ramon L. Ruiz to oversee the cleft and craniofacial sections, and Dr. Peter D. Waite to oversee the esthetic surgery section. Dr. J. Robert Scully assisted Dr. Turvey in editing the orthognathic surgery section. Perhaps the greatest improvement in this volume is an added emphasis on diagnostic and treatment planning. The esthetic surgery and cleft and craniofacial surgery sections have been expanded in scope and depth.

After an analysis of the changing field of oral and maxillofacial surgery, we strove to present a comprehensive, current book that defined the present scope of our specialty. We hope that the reader appreciates and agrees with our efforts. We stated in the preface of the first edition that we hoped that our future attempts will present an even broader scope of oral and maxillofacial surgery. The fact that this edition has succeeded in that regard is a testament to the individuals who are constantly expanding the envelope.

ACKNOWLEDGMENTS

The second edition of *Oral and Maxillofacial Surgery* is a team effort. Drs. Robert Marciani and Timothy Turvey were tireless in their efforts to improve on the first edition. They brought numerous authors on board who added depth and breadth to this edition. The section editors were equally invaluable contributors to the success of this effort. Drs. H. Dexter Barber, Thomas W. Braun, Eric R. Carlson, Bernard J. Costello, John Matheson, Ramon L. Ruiz, J. Robert Scully, and Peter D. Waite diligently pestered authors so that deadlines could be *almost* met. This edition attempts to comprehensively define the scope of oral and maxillofacial surgery and could not have come to fruition without all these contributors.

Residents are the lifeblood of our specialty. Many have contributed portions of chapters in this book. They also have provided us with friendship, dedication, intellectual stimulation, and humility, without which this book would not have been written.

Last, we would like to thank all the staff who helped prepare these manuscripts and the editorial staff at Elsevier, who were so patient with our procrastination, and meticulous in their development and editing of this book.

CONTENTS

VOLUME II CONTENTS

Trauma, Surgical Pathology, Temporomandibular Disorders

Volume Editor: Robert D. Marciani

CHAPTER 1

Peri-operative Management of the Cranio-Maxillofacial Trauma Patient

John F. Caccamese, Jr. • Domenick P. Coletti

HISTORIC PERSPECTIVE

The successful management of cranio-maxillofacial injuries, as with any traumatic injury, begins with the immediate application of the principles of advanced trauma life support (ATLS). Trauma care, as we currently know it, has evolved from the close association of surgery and casualty management in times of war. Many key concepts, including pre-hospital care, triage, and transport; volume resuscitation; wound management; and critical care, were later refined based on the experience gained during military conflict.

Many of our patients might not have otherwise survived their injuries had it not been for the standards set forth by the American College of Surgeons (ATLS) and for the work of trauma care pioneers like R. Adams Cowley at the University of Maryland. The work of Cowley was vital to the implementation of modern trauma care and the design of the modern trauma unit. His vision led to the development of the first clinical shock trauma unit in the nation (Figure 1-1). He was one of the first to recognize the importance of pre-hospital care in its association with the trauma center, and his "Golden Hour" theory emerged based on the importance of speed and skill in resuscitation and operative intervention. Cowley also developed the first statewide air medical system to ensure rapid transport of critically ill or injured patients to the trauma center (Figure 1-2). Maryland instituted the first statewide emergency medical services (EMS) system, and it, like the Shock Trauma Center, has become a model worldwide.

INTRODUCTION

Death as a result of trauma follows a tri-modal distribution with the first peak occurring at the time of injury, within seconds to minutes. This is typically the result of brain, brain stem, spinal cord, heart, or great vessel injury. Only prevention can effectively decrease death caused by injury in the first peak. The second peak occurs within minutes to hours of injury. ATLS was implemented with this critical period in mind. Fatal or life-threatening injuries commonly encountered in this group include subdural/epidural hematomas, hemothorax/pneumothorax, pelvic fractures, and spleen/liver lacerations. Rapid transport, assessment, and intervention may greatly improve survival in this group. Lastly, the third peak takes place days to weeks after the initial injury. Commonly, mortality in this group is due to sepsis and multisystem organ failure. At this point, outcome is affected by any and all who have provided care prior to this stage.[1]

ASSESSMENT

PRIMARY SURVEY

The initial assessment, also known as the primary survey, calls for immediate identification and management of all life-threatening issues. One must assume that:

- There are multiple injuries
- The physiologic state of the patient is impaired
- The condition of the patient might worsen rapidly

Treatment priorities are based on exam findings, vital signs, and known events surrounding the injury. It is also important to understand that the patient's most obvious injury might not be his or her most critical injury, and a patient with critical injuries to several different organ systems often presents conflicting priorities in management. Attention is initially directed at the resuscitation of vital functions and treating immediately life-threatening problems following a rapid, yet accurate, initial survey. This survey should take no longer than 5 to 10 minutes and includes:

- A—Airway
- B—Breathing
- C—Circulation
- D—Disability
- E—Exposure

A more detailed secondary head-to-toe assessment will be performed eventually, followed by the delivery of definitive care for all patient injuries.

AIRWAY

Since the loss of airway kills faster than the inability to breathe, the commonality between all forms of formal life