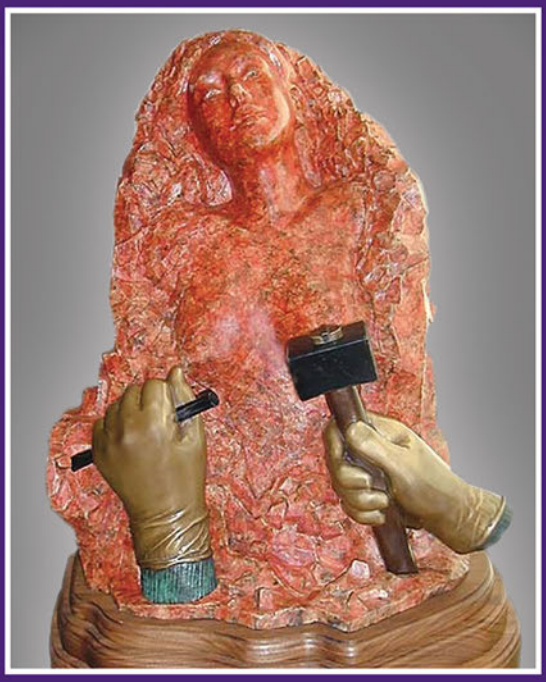
Essentials of Aesthetic Surgery



Jeffrey E. Janis

Thieme

Essentials of Aesthetic Surgery

Essentials of Aesthetic Surgery

Edited by

Jeffrey E. Janis, MD, FACS

Professor of Plastic Surgery, Neurosurgery,
Neurology, and Surgery;
Executive Vice Chairman, Department
of Plastic Surgery;
Chief of Plastic Surgery, University Hospitals;
President-Elect, American Society
of Plastic Surgeons;
The Ohio State University Wexner Medical Center,
Columbus, Ohio

With Illustrations by

Graeme Chambers
Amanda L. Tomasikiewicz, MA
Sarah J. Taylor, MS, BA
Jennifer N. Gentry, MA, CMI

Thieme

Managing Editor: Haley Paskalides
Director, Editorial Services: Mary Jo Casey
Production Editor: Sean Woznicki
International Production Director: Andreas Schabert
Editorial Director: Sue Hodgson
International Marketing Director: Fiona Henderson
International Sales Director: Louisa Turrell
Director of Institutional Sales: Adam Bernacki
Senior Vice President and Chief Operating Officer: Sarah Vanderbilt
President: Brian D. Scanlan

Library of Congress Cataloging-in-Publication Data

Names: Janis, Jeffrey E., editor.
Title: Essentials of aesthetic surgery / [edited by] Jeffrey E. Janis, MD, FACS, Professor of Plastic Surgery, Neurosurgery, Neurology, and Surgery Executive Vice Chairman, Department of Plastic Surgery, Chief of Plastic Surgery, University Hospitals, President-Elect, American Society of Plastic Surgeons, Ohio State University Wexner Medical Center, Columbus, OH.
Description: New York : Thieme, [2018] | Includes bibliographical references.
Identifiers: LCCN 2017054012 | ISBN 9781626236547 (paperback) | ISBN 9781626238671 (ebook)
Subjects: LCSH: Surgery, Plastic. | BISAC: MEDICAL / Surgery / Plastic & Cosmetic. | MEDICAL / Surgery / General.
Classification: LCC RD118 .E87 2018 | DDC 617.9/52—dc23
LC record available at https://lccn.loc.gov/2017054012

Thieme Publishers New York
333 Seventh Avenue, New York, NY 10001 USA
+1 800 782 3488, customerservice@thieme.com

Thieme Publishers Stuttgart
Rüdigerstrasse 14, 70469 Stuttgart, Germany
+49 [0]711 8931 421, customerservice@thieme.de

Thieme Publishers Delhi
A-12, Second Floor, Sector-2, Noida-201301
Uttar Pradesh, India
+91 120 45 566 00, customerservice@thieme.in

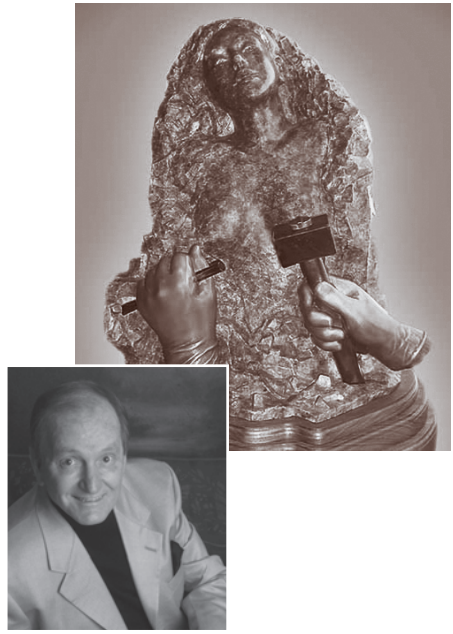
Thieme Publishers Rio, Thieme Publicações Ltda.
Edifício Rodolpho de Paoli, 25º andar
Av. Nilo Peçanha, 50 – Sala 2508
Rio de Janeiro 20020-906, Brasil
+55 21 3172 2297 / +55 21 3172-1896

Cover design: Thieme Publishing Group
Typesetting by Debra Clark

Printed in India by Replika Press, Pvt Ltd. 5 4 3 2 1

ISBN 978-1-62623-654-7

Also available as an e-book:
eISBN 978-1-62623-867-1



Cover photograph of the sculpture
”Surgical Aesthetic Art”
provided by the Ronadró Collection.
Additional sculptures by the artist can be found at
www.ronadro.com

To my wife, Emily, and my three children, Jackson, Brinkley, and Holden,

who are the center of my life and universe, and who give me the love, support,

understanding, and inspiration to do better, and be better, every day

Contributors

Paul N. Afrooz, MD
Aesthetic Surgery Fellow, Dallas Plastic Surgery Institute, Dallas, Texas

Patricia Aitson
Medical Photography Supervisor, Department of Plastic Surgery, University of Texas Southwestern Medical Center, Dallas, Texas

Amy Kathleen Alderman, MD, MPH
Private Practice, Alpharetta, Georgia

Tyler M. Angelos, MD, FACS
Columbus Aesthetic and Plastic Surgery, Columbus, Ohio

Molly Burns Austin, MD
Dermatologist, Dermatology Consultants of North Dallas, Dallas, Texas

James L. Baker, Jr., MD, FACS
Clinical Professor of Plastic Surgery, University of South Florida, Tampa; Professor of Surgery, College of Medicine, University of Central Florida, Orlando, Florida

Alfonso Barrera, MD, FACS
Clinical Assistant Professor of Plastic Surgery, Baylor College of Medicine, Houston, Texas

Daniel O. Beck, MD
Private Practice, Dallas Plastic Surgery Institute, Dallas, Texas

Amanda Behr, MA, CMI, CCA, FAMI
Interim Chair and Program Director, Clinic Director and Anaplastologist, Department of Medical Illustration, Augusta University; Augusta University Clinic for Prosthetic Restoration, Augusta, Georgia

J. Byers Bowen, MD, MS
Independent Resident, Department of Plastic and Reconstructive Surgery, The Ohio State University Wexner Medical Center, Columbus, Ohio

George Broughton II, MD, PhD, FACS
Regional Health Command Europe, Assistant Chief of Staff, Warrior Transition Faculty, Plastic and Reconstructive Surgery, Landstuhl Regional Medical Center, Landstuhl, Germany

Joseph M. Brown, MD
Plastic Surgeon and Medical Director, Tampa Aesthetic and Plastic Surgery, Lutz, Florida

Alton Jay Burns, MD
Dallas Plastic Surgery, Dallas, Texas

Michael R. Bykowski, MD
Resident, Department of Plastic Surgery, University of Pittsburgh Medical Center, Pittsburgh, Pennsylvania

Jeff Chang, MD
Resident, Division of Plastic and Reconstructive Surgery, Stanford University Medical Center, Palo Alto, California

Wendy Chen, MD, MS
Resident Physician, Department of Plastic Surgery, University of Pittsburgh Medical Center, Pittsburgh, Pennsylvania

William Pai-Dei Chen, MD
Clinical Professor of Ophthalmology, UCLA School of Medicine, Los Angeles; Harbor UCLA Medical Center, Irvine, California

Christopher T. Chia, MD
Surgical Director, bodySCULPT; Clinical Attending, Manhattan Eye, Ear, and Throat Hospital, New York, New York

Jeffrey R. Claiborne, MD
Plastic Surgeon, Private Practice, Sieveking and Claiborne Plastic Surgery, Nashville, Tennessee

Sydney R. Coleman, MD
Clinical Assistant Professor of Plastic Surgery, Hansjörg Wyss Department of Plastic Surgery, New York University School of Medicine, New York University Langone Medical Center, New York, New York

Mark B. Constantian, MD, FACS
Adjunct Clinical Professor, Department of Surgery, Division of Plastic and Reconstructive Surgery, University of Wisconsin School of Medicine, Madison, Wisconsin; Visiting Professor, Department of Plastic Surgery, University of Virginia School of Medicine, Charlottesville, Virginia

Michelle Coriddi, MD
Plastic Surgeon, Memorial Sloan Kettering Cancer Center, Plastic and Reconstructive Surgery Service, New York, New York

Melissa A. Crosby, MD, PLLC
Plastic Surgeon, Private Practice, Sugar Land, Texas

Lily Daniali, MD
Burn and Reconstructive Centers of Colorado, Englewood, Colorado

Edward H. Davidson, MA (Cantab), MD
Assistant Professor, Division of Plastic Surgery, Montefiore Medical Center/Albert Einstein, College of Medicine; The Atrium, Montefiore Medical Center, New York, New York

Zoe Diana Draelos, MD
Consulting Professor, Department of Dermatology, Duke University School of Medicine, Durham, North Carolina

Dino R. Elyassnia, MD, FACS
Marten Clinic of Plastic Surgery, San Francisco, California

Maristella S. Evangelista, MD, MBA
Assistant Professor, The Ohio State University, Columbus, Ohio

Steve Fagien, MD, PA
Physician, Private Practice, Boca Raton, Florida

Jordan P. Farkas, MD
Plastic Surgeon, Private Practice, Paramus, New Jersey

Darrell Wayne Freeman, MD
Department of Plastic Surgery, The Ohio State University, Columbus, Ohio

Brian H. Gander, MD
Assistant Professor, Division of Plastic Surgery, University of Wisconsin, Madison, Wisconsin

Ashkan Ghavami, MD
Assistant Clinical Professor, David Geffen UCLA School of Medicine, Los Angeles; Private Practice, Ghavami Plastic Surgery, Beverly Hills, California

Grant Gilliland, MD
Physician, Baylor University Medical Center, Waco; Texas A&M College of Medicine, Dallas, Texas

†**Mark Gorney, MD**
Plastic Surgeon, Napa, California

†Deceased.

Miles Graivier, MD
Plastic Surgeon, The Graivier Center for Plastic Surgery, Roswell, Georgia

James Christian Grotting, MD, FACS
Clinical Adjunct Professor, The University of Alabama at Birmingham; Private Practice, Grotting Plastic Surgery Birmingham, Alabama; The University of Wisconsin, Madison, Wisconsin

Jeffrey A. Gusenoff, MD
Associate Professor of Plastic Surgery, Co-Director, Life After Weight Loss Program, Department of Plastic Surgery, University of Pittsburgh School of Medicine, Pittsburgh, Pennsylvania

Bahman Guyuron, MD, FACS
Emeritus Professor, School of Medicine, Case Western Reserve University, Lyndhurst, Ohio

Richard Y. Ha, MD
Dallas Plastic Surgery Institute, Dallas, Texas

Elizabeth Hall-Findlay, MD
Private Practice, Banff Plastic Surgery, Banff, Alberta, Canada

Adam H. Hamawy, MD, FACS
Plastic Surgeon, Princeton Plastic Surgeons, Princeton, New Jersey

Dennis C. Hammond, MD
Partners in Plastic Surgery, Grand Rapids, Michigan

Christine Hamori, MD
Cosmetic Surgery and Skin Spa, Duxbury, Massachusetts

Bridget Harrison, MD
Hand Surgery Fellow, UCLA School of Medicine, Los Angeles, California

Ahmed M. Hashem, MD
Professor of Plastic Surgery, Cairo University, Kasr Al-Ainy, Faculty of Medicine, Cairo University, El Manial, Cairo, Egypt

William Y. Hoffman, MD
Professor and Chief, Division of Plastic and Reconstructive Surgery, Stephen J. Mathes Endowed Chair in Plastic Surgery, Division of Plastic Surgery, University of California, San Francisco, San Francisco, California

Ronald E. Hoxworth, MD, MBA, FACS
Chief of Plastic Surgery, University Hospitals, University of Texas Southwestern Medical Center, Dallas, Texas

John H. Hulsen, MD
Plastic Surgeon, Associated Plastic Surgeons, Leawood, Kansas

Joseph Hunstad, MD, FACS
President, The Hunstad Kortesis Center for Cosmetic Plastic Sugergy; President, The Internatonal Consortium of Aesthetic Plastic Surgeons; Member, Board of Directors, The American Society for Aesthetic Plastic Surgery; Associate Consulting Proessor, Division of Plastic Surgery, The University of North Carolina, Chapel Hill; Section Head of Plastic Surgery, Department of Surgery, Carolinas Medical Center, University Hospital, Charlotte, North Carolina

Cedric L. Hunter, MD
Stanford University Medical Center, Palo Alto, California

Jeffrey E. Janis, MD, FACS
Professor of Plastic Surgery, Neurosurgery, Neurology, and Surgery; Executive Vice Chairman, Department of Plastic Surgery; Chief of Plastic Surgery, University Hospitals; President-Elect, American Society of Plastic Surgeons; The Ohio State University Wexner Medical Center, Columbus, Ohio

Rishi Jindal, MD
Fellow, University of Pittsburgh Medical Center, Pittsburgh, Pennsylvania

Glyn Jones, MD, FRCS(Ed), FCS(SA), FACS
Visiting Professor of Surgery, Plastic and Reconstruction, Illinois Cosmetic and Plastic Surgery, Peoria, Illinois

Girish P. Joshi, MBBS, MD, FFARCSI
Professor of Anesthesiology and Pain Management, University of Texas Southwestern Medical Center, Dallas, Texas

Evan B. Katzel, MD
University of Pittsburgh Medical Center, Pittsburgh, Pennsylvania

Phillip D. Khan, MD
Plastic Surgeon, Lead Clinician, Coastal Plastic Surgery, Supply, North Carolina

Sami U. Khan, MD, FACS
Associate Professor of Plastic Surgery, Stony Brook Medicine, Stony Brook, New York

Ibrahim Khansa, MD
Resident, Department of Plastic Surgery, The Ohio State University Wexner Medical Center, Columbus, Ohio

Rohit K. Khosla, MD
Division of Plastic and Reconstructive Surgery, Stanford University, Palo Alto, California

Kuylhee Kim, MD
Aesthetic and Reconstructive Breast Surgery Fellow, Partners in Plastic Surgery in West Michigan, Grand Rapids, Michigan

Janae L. Kittinger, MD
One Health Plastic and Reconstructive Surgery, Owensboro, Kentucky

David M. Knize, MD
Associate Clinical Professor of Surgery, Department of Plastic Surgery, University of Colorado Health Sciences Center, Colorado Springs, Colorado

Michael Larsen, MD
Department of Plastic Surgery, The Ohio State University Medical Center, Columbus, Ohio

Michael R. Lee, MD
Assistant Professor, Department of Plastic Surgery, University of Texas Southwestern Medical Center, Dallas, Texas

Jason E. Leedy, MD
Cleveland Plastic Surgery Institute, Mayfield Heights, Ohio

Joshua Lemmon, MD
Private Practice, DFW Metroplex, Richardson, Texas

Jerome H. Liu, MD, MSHS
Liu Plastic Surgery, Los Gatos, California

Deborah Stahl Lowery, MD
Assistant Professor, Anesthesiology, The Ohio State University Wexner Medical Center; Ear and Eye Institute Outpatient Surgery Center, Columbus, Ohio

Raman C. Mahabir, MD
Chair, Division of Plastic, Reconstructive, and Cosmetic Surgery, Mayo Clinic Arizona, Phoenix, Arizona

Alexey M. Markelov MD
Private Practice, Coos Bay, Oregon; Clinical Assistant Professor, The Ohio State University, Columbus, Ohio

Constantino G. Mendieta, MD
Surgeon, Private Practice, Miami, Florida

Joseph Meyerson, MD
Resident, The Ohio State University Wexner Medical Center, Columbus, Ohio

Cecilia Alejandra Garcia de Mitchell, MD
Division Chief, Plastic Surgeon, The Children's Hospital of San Antonio; Affiliate Faculty Department of Surgery, Baylor College of Medicine; Adjunct Assistant Professor, Department of Surgery, Division of Plastic Surgery, University of Texas Health Science Center, San Antonio, Texas

Girish S. Munavalli, MD, MHS
Medical Director, Dermatology, Laser, and Vein Specialists of the Carolinas, Charlotte; Assistant Professor, Department of Dermatology, Wake Forest University School of Medicine, Winston Salem, North Carolina

Purushottam A. Nagarkar, MD
Assistant Professor, Department of Plastic Surgery, University of Texas Southwestern Medical Center, Dallas, Texas

Foad Nahai, MD, FACS
Maurice Jurkiewicz Chair in Plastic Surgery and Professor of Surgery, Division of Plastic and Reconstructive Surgery, Department of Surgery, Emory University School of Medicine, Atlanta, Georgia

Christopher J. Pannucci, MD, MS
Assistant Professor, Division of Plastic Surgery, University of Utah, Salt Lake City, Utah

Thornwell H. Parker III, MD
Volunteer Faculty, Department of Plastic Surgery, University of Texas Southwestern Medical Center; Staff, Department of Plastic Surgery, Texas Health Presbyterian Hospital of Dallas, Dallas, Texas

Harlan Pollock, MD, FACS
Instructor, Retired, University of Texas Southwestern, Dallas, Texas

Todd A. Pollock, MD, FACS
Surgeon, University of Texas Southwestern Medical Center, Dallas, Texas

Jason K. Potter, MD, DDS
Dallas Plastic Surgery Institute, Dallas, Texas

Smita R. Ramanadham, MD
Attending Surgeon, Division of Plastic Surgery, Boston Medical Center; Assistant Professor of Surgery, Boston University School of Medicine, Boston, Massachusetts

Neal R. Reisman, MD, JD, FACS
Clinical Professor, Plastic Surgery, Baylor College of Medicine, Houston, Texas

Juan L. Rendon, MD, PhD
Clinical Instructor Housestaff, The Ohio State University Wexner Medical Center, Columbus, Ohio

Luis M. Rios, Jr.
Adjunct Clinical Professor, Department of Surgery, University of Texas Health Science Center, Edinburg, Texas

Edward J. Ruane, Jr., MD
Resident, Department of Plastic Surgery, University of Pittsburgh, Pittsburgh, Pennsylvania

Christopher J. Salgado, MD
Professor of Surgery and Interim Chief, Division of Plastic Surgery, Section Chief, University of Miami Hospital; Medical Director, LGBTQ Center for Wellness, Gender and Sexual Health, University of Miami/Miller School of Medicine, Miami, Florida

Renato Saltz, MD
Saltz Plastic Surgery, Salt Lake City, Utah

Robert K. Sigal, MD
President, Austin-Weston, The Center for Cosmetic Surgery, Inova Fairfax Hospital, Reston, Virgnia

Sammy Sinno, MD
TLKM Plastic Surgery, Chicago, Illinois

Wesley N. Sivak, MD, PhD
Resident, Department of Plastic Surgery, University of Pittsburgh, Pittsburgh, Pennsylvania

Christopher Chase Surek, MD
Aesthetic Surgery Fellow, Department of Plastic Surgery, Cleveland Clinic, Cleveland, Ohio

Sumeet Sorel Teotia, MD
Associate Professor, Plastic Surgery, University of Texas Southwestern Medical Center, Dallas, Texas

Edward O. Terino, MD
CEO and President, Plastic Surgery Institute, Agoura Hills, California

Spero J. Theodorou, MD
Instructor, Aesthetic Plastic Surgery Fellowship, Manhattan Eye, Ear, and Throat Hospital, New York, New York

Charles H. Thorne, MD
Chairman, Department of Plastic Surgery, Lenox Hill Hospital; Manhattan Eye, Ear, and Throat Hospital, New York, New York

Dean M. Toriumi, MD
Professor, Department of Otolaryngology, University of Illinois at Chicago, Chicago, Illinois

Derek Ulvila, MD
Aesthetic Plastic Surgery Fellow, Manhattan Eye, Ear, and Throat Hospital, New York, New York

Simeon H. Wall, Jr., MD, FACS
Private Practice, The Wall Center for Plastic Surgery; Assistant Clinical Professor, Department of Plastic Surgery, University of Texas Southwestern Medical Center, Dallas, Texas; Assistant Clinical Professor, Division of Plastic Surgery, Louisiana State University Health Sciences Center at Shreveport, Shreveport, Louisiana

Ted H. Wojno, MD
Director, Oculoplastic and Orbital Surgery, Department of Ophthalmology, The Emory Clinic; Professor of Ophthalmology, Emory University School of Medicine, The Emory Clinic, Atlanta, Georgia

Vernon Leroy Young, MD
Private Practice, Washington, Missouri

James E. Zins, MD
Chairman, Department of Plastic Surgery, Cleveland Clinic, Cleveland, Ohio

Terri A. Zomerlei, MD
Resident, Department of Plastic Surgery, The Ohio State University, Columbus, Ohio

Foreword

I first met Dr. Janis when he was in training. We established a friendship and I have followed his career with interest and admiration ever since. It was clear to me immediately that he had leadership qualities, a commitment to teaching, and academics and most of all excellence as a clinician. He very quickly became a contributor, educator and innovator. His published works, his many international and national presentations attest to his commitment to teaching and his leadership qualities were recently recognized as he assumed the presidency of the American Society of Plastic Surgeons.

The idea behind *Essentials of Aesthetic Surgery* has been in gestation for many years and it is exciting to see the concept come to fruition. The intent is to provide a detailed guide to the field based on the same didactic, high-yield format of the best-selling book *Essentials of Plastic Surgery,* now in its second edition. Although there are some chapters in the *Essentials of Plastic Surgery* that cover aesthetic surgery, this new book has vastly deeper and wider, comprehensive coverage, offering 65 detailed chapters as opposed to the 16 offered in *Essentials* and covering the full spectrum of procedures in the face and body. The book has been thoughtfully structured to maximize learning with signature bulleted text and clear, memorable line drawings. It is published with an e-book version ideal for use by readers on-the-go and who may not wish to carry the print version with them.

A new concept, and unique to this text, is that most chapters are authored by a younger plastic surgeon working with one who has been in practice far longer. The younger author would be more aware of the needs of those in the early years in practice as well as those in training. The senior author with more years of experience has the long-term perspective of the procedures discussed. Specifically, which are efficacious, which are safe and which last longest. This blending of a young plastic surgeon's views and the experience of the senior surgeon brings valuable perspective to each chapter in the book and sets this book apart from the others in its class.

ASAPS statistics indicate the undiminished growth of aesthetic surgery, with patient procedures up 19% in the last decade.[1] More and more trainees aspiring to a career in aesthetic surgery, as evidenced by diplomates of the American Board of Plastic Surgery, overwhelmingly select the Aesthetic module for maintenance of certification. This book provides an invaluable educational resource, guide, and companion to those seeking the core facts—a treasure trove of knowledge distilled by Dr. Janis and his team of highly regarded contributors. It is my distinct pleasure to recommend this volume as the perfect first step into the world of aesthetic surgery and to congratulate Dr. Janis warmly for his dedication and skill in putting the volume together.

Foad Nahai, MD, FACS
Maurice Jurkiewicz Chair in Plastic Surgery
and Professor of Surgery, Division of Plastic
and Reconstructive Surgery, Department
of Surgery, Emory University School of Medicine,
Atlanta, Georgia

[1]Cosmetic Surgery National Data Bank Statistics. Aesthet Surg J 37(Suppl 2):1, 2017.

Preface

The idea for this book actually came right after the first edition of *Essentials of Plastic Surgery* was published in 2007. At the time, I thought it would be neat to carry the concept one step further by focusing on aesthetic surgery, dedicating a book to it in the same stylistic vein as the parent title—with high-point and high-impact information that was current and relevant, presented in bullet-point format with references to classic articles and best available data, richly illustrated and presented in a fit-in-your-coat-pocket format. The table of contents was created in 2008 and both junior and senior authors were invited to contribute. The concept was to present the information comprehensively but concisely and to supplement it with "color commentary" from experienced surgeons who can add a three-dimensionality to the work by adding decades of experience—things known, but not necessarily written down all the time. Ultimately, despite a decade in the making, the book is now in your hands as the culmination of so many hands and minds, hopefully as a valuable and practical guide to the world of cosmetic surgery.

The book comprises 65 chapters spanning the breadth of aesthetic surgery, organized into nine parts—from Skin Care to Noninvasive Modalities to Surgical Approaches and everything in between. Each chapter follows the same basic format for ease of familiarity and readability. The common topics are covered, of course, such as facelift, necklift, blepharoplasty, rhinoplasty, breast augmentation, liposuction, abdominoplasty, thigh lift, and beyond. However, deep dive chapters are provided to get into the detail required to truly master the content—such as correction of the tear trough deformity, lateral canthopexy, Asian blepharoplasty, secondary and ethnic rhinoplasty, the nasolabial fold, lip augmentation, nonsurgical rejuvenation, augmentation-mastopexy, gluteal augmentation, genital surgery, and transgender surgery. Furthermore, there are topics covered to round out the utility and comprehensive approach to cosmetic surgery, such as proper patient selection, safety considerations, the artistry of aesthetic surgery, anesthesia considerations, multimodal analgesia, and photography.

Rich, two-color figures and tables were added to help effectively illustrate and convey the information to the reader. An online version was developed to make it more universal, accessible, and current. Top Takeaways were added to the end of each chapter to summarize the content for the quick hit review.

The true test of its utility, however, will be whether it sits on your shelf or in your pocket. My sincere hope is that you find it to be an indispensable companion with you on rounds, in the clinic, in the operating room, in the conference room, or in the emergency department as you care for these patients. And although it took 10 years to create, my hope is that you find it to be current, relevant, and of the same highest level of quality you've come to expect from an *Essentials* book.

Jeffrey E. Janis

Acknowledgments

Without question, this book could not have been possible without a tremendous number of people who have contributed to it since 2008. Indeed, the book has actually seen three different publishers, originally Quality Medical Publishing, then CRC Press, and finally Thieme Publishers, so clearly there are many to acknowledge.

Without question, I owe a tremendous debt of gratitude to the authors across the country who have taken an incredible amount of time out of their busy practices and lives to carefully comb and review the literature in order to create and construct these high quality chapters. Their careful attention to detail was matched by their patience as they endured a lengthy and rigorous editing process where every word and illustration was carefully scrutinized. As they will clearly attest, meticulous attention to detail and emphasis on quality and accuracy demanded much energy, persistence and determination. To them, I am sincerely grateful for their time and for the fruit of their efforts.

Sincere appreciation also is owed to Karen Berger, Michelle Berger, Andrew Berger, and Amy Debrecht of Quality Medical Publishing, who originally signed the book back in 2008, and to Makalah Boyer and Suzanne Wakefield of CRC Press and subsequently Thieme Publishers for their significant contributions. Special recognition goes to Editorial Director Sue Hodgson, without whom this book would never be possible, and Judith Tomat who dedicated an incredible amount of effort in the editing process and who carried it across the finish line. Special gratitude also goes to Brenda Bunch and her team of illustrators, who deserve an amazing amount of credit for all of the graphics that were drawn from scratch, which makes this book pop alive with color, clarity, and flavor.

Most importantly, and with the deepest and most sincere appreciation, I would like to thank my wife, Emily, and our three children Jackson, Brinkley, and Holden, all of whom were born during the creation of this book, for their understanding and patience during the years, allowing the time and travel to complete this book, and above all else, for their unconditional love and support. Without them, this book would not be possible, and my life would be empty.

Contents

Part III ▪ Safety

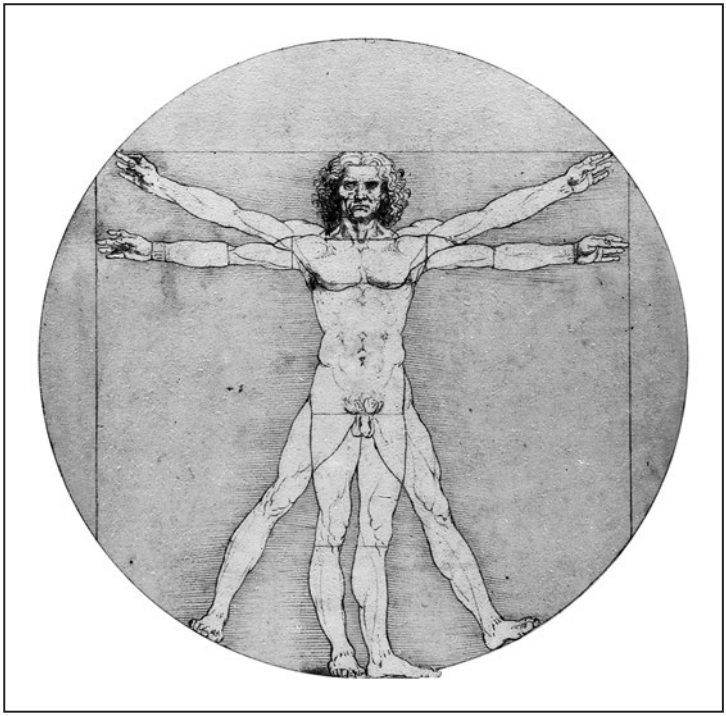
Part IV ▪ Skin Care

Part V ▪ Noninvasive and Minimally Invasive Therapy

Essentials of Aesthetic Surgery

Part I

Basic Considerations



1. The Aesthetic Surgery Patient

Adam H. Hamawy, Foad Nahai

SENIOR AUTHOR TIP: Cosmetic surgery is elective and rarely addresses medical conditions, but it restores or improves physical features that are concerning to patients. Although the request for aesthetic surgery is most commonly associated with aging, some patients seek improvement of normal anatomic structures to enhance their appearance.

DEMOGRAPHICS AND STATISTICS[1,2]

- Interest in cosmetic procedures continues to increase with over $15 million spent annually in the United States for combined surgical and nonsurgical procedures.
- 91% are women, and 9% are men.
- Approximately 25% of cosmetic patients are minorities.
- Approximately 40% of cosmetic patients are 35-55 years of age.
- Approximately 50% of patients have multiple procedures.
  - >50% of patients who have a cosmetic procedure will return for another one.
  - 47% of patients have multiple procedures performed simultaneously.

ROLE OF THE AESTHETIC SURGEON

- Is a **physician first** and an aesthetic surgeon second
- Acts as a physician, therapist, and artist:
  - **Physician:** Evaluates the patient to determine surgical feasibility and medical fitness
  - **Therapist:** Recognizes psychology that may be amplified by surgery
  - **Artist:** Considers aesthetic objectives. Will not go against aesthetic sense
- Must have a clear understanding of patient's motivation and expectations before surgery
- Ultimately concerned with the patient's welfare
- An experienced aesthetic surgeon should be able to recognize **body dysmorphic disorder** and **severe depression.** Many patients seeking aesthetic surgery are excellent candidates and do well postoperatively despite taking antidepressants.[3]
- A well-informed patient is a happy patient.

PATIENT CHARACTERISTICS

- **The shopper:** Consults several surgeons before making decision, compares factors such as prices, staff, availability, reputation, website, and online reputation
- **The talker:** Takes considerable time during consultation and may have many questions about multiple problems
- **The planner:** Has already decided exactly what he or she wants and is looking to see if surgeon can do it
- **The listener:** Does not talk much and wants surgeon to explain everything and make the decisions

PATIENT CONSULTATION

Introduction and First Impression

- Patients may be nervous and insecure about their appearance.
- Personal conversation at the beginning of the consultation helps to relax patients and establish rapport.
- The surgeon should begin immediately assessing the patient's general appearance, demeanor, and behavior during the initial interaction.
- The initial introduction should also establish why the patient is there to see the surgeon and what their aesthetic concerns are.
- Psychological and physical evaluation begins with the first impression.[4]

SENIOR AUTHOR TIP: Today most patients come in for a consultation having researched on the Internet and most likely consulted with other physicians. After an introduction and "small talk" designed to put patients at ease, I will ask how much they know about the procedure they are interested in. After they respond, I will add that I will provide them all the information I feel is important in making a decision.

Health History

- Baseline health, comorbidities, tobacco use, prior surgeries, and prior pregnancies are determined.
- Surgical risk is carefully assessed based on medical history and desired procedure.
- Health criteria for aesthetic surgery should be at least as stringent as those for reconstructive cases because of the strictly elective nature.
- Surgery may be deemed inappropriate for unhealthy patients and those with a high risk of complications.

SENIOR AUTHOR TIP: Patients often ask me if they are too old for a facelift. I tell them there is no such thing as "too old for a procedure"; it is not age that counts but general health. The question should be, "Am I healthy enough for a facelift?" I am also asked, "Am I too young for a facelift." My answer is that there is no set age. If I think the patient will see an improvement, I will recommend a facelift regardless of age.

SENIOR AUTHOR TIP: I find some patients are not always forthcoming about health issues for fear of being turned down. For facial rejuvenation, I usually ask about smoking history. If they say, "I do not smoke," I will ask if they ever have in the past and, if so, for how long and how heavily. I repeatedly ask about high blood pressure, because I believe untreated and or unrecognized hypertension is the major contributing factor to hematoma after facial rejuvenation. When patients are asked about prior surgery, most may not list cosmetic surgery. I specifically ask every patient if they had previous aesthetic procedures.

Psychological Evaluation[4]

- A significant proportion of patients desiring cosmetic surgery may have some psychopathology.
  - Cosmetic surgery may improve symptoms in some patients with psychological conditions like depression or neurosis.
  - Certain groups consistently are shown to do poorly after aesthetic procedures.
- Aesthetic surgeons should be able to identify psychologically unfit patients and make suitable recommendations.[5] *Psychiatric consultation should be obtained when appropriate*.
- Aesthetic surgeons determine how closely a patient's self-image matches the true image and decide if the patient's self-image can be improved with surgery performed on the true image.[6]

SENIOR AUTHOR TIP: I like to determine the motivation behind the desire for surgery. Is the patient doing this for himself or herself? Are there hidden agendas such as saving a failing marriage, wishing to please a partner or parent? I advise my patients they should do it for themselves and not for anyone else. An otherwise excellent surgical result may lead to patient disappointment if it does not meet the hidden agenda. A more youthful face or shapely body may not save a failing marriage or push a boyfriend or girlfriend into a proposal. Why patients seek a procedure and who they are trying to please may not always be readily apparent, but it is important for surgeons to know.

Psychological Indicators

- **Positive indicators (green light)**
  - Patient has anatomic flaw that is visible to both the patient and the surgeon.
  - Patient is not preoccupied with flaw and has been planning cosmetic surgery for a long time.
  - Patient generally feels good about himself or herself, is aging, and wants to look younger.
- **Negative indicators (red flags)**
  - Patient complains of anatomic flaws that the aesthetic surgeon does not perceive.
  - Patient is attempting to fix a social problem by surgically correcting appearance.
  - Patient impulsively decided on cosmetic surgery and has considered it for only a brief period of time.
  - Patient had multiple cosmetic procedures and is always dissatisfied with the results.
  - Patient has excessively "shopped" for surgeons. Patients who are still uncertain after meeting with three or more surgeons are often difficult and unhappy after surgery.
  - Patient is being treated for multiple psychiatric illnesses and/or history of numerous psychiatric admissions.

Motivation

- Intensity of motivation positively correlates with satisfaction and shorter recovery and negatively correlates with postoperative pain.
- Patients seeking cosmetic surgery are motivated by **internal** or **external** pressures.
  - Patients with **internal motives** are generally better candidates than those with external motives.
  - Patients with internal motives desire change for themselves and usually feel vulnerable about deficits in appearance and a commitment to physical change.

- Psychological state is secondary to a definite physical defect. Correction of the defect alleviates the anxiety.
- Perceived physical deficit may not be easy to discern from genuine deficit.

CAUTION: If a perceived deficit is a major focus and is out of proportion with the genuine deficit, then the patient may find another focus to channel anxiety after surgical correction.

- Patients with **external motives** seek to please others who think that physical change will result in a social change (e.g., improve a relationship, save a marriage, advance a career).
  - ► Social goals are often not met, resulting in dissatisfaction with surgery.
  - ► May be pressured into the procedure and passive about surgery
  - ► Motivation levels are weaker if not also driven internally and may indicate a more difficult postoperative course.

Psychological Conditions

■ **Depression**[7-9]

- The **most commonly** encountered psychological disorder in cosmetic patients
- Can be transient as a reaction to grief or a persistent pathological process. Patients have minimal joy and poor motivation and consistently appear tired.
- When treated and controlled, depressed patients make great surgical candidates and may show additional improvement of symptoms with cosmetic surgery.

SENIOR AUTHOR TIP: A significant number of my patients undergoing facial rejuvenation take antidepressants. They do well and recover as rapidly and are as pleased as those who do not take antidepressants. Though concerns have been raised that selective serotonin reuptake inhibitor (SSRI) antidepressants may increase the risk of hematoma, this has not been my experience.

■ **Personality disorders**

- *Personality disorders present usually with behavioral issues.* Some personality disorders are not well suited for cosmetic surgery, and psychiatric evaluations may be warranted before proceeding.
- **Narcissistic patients** take good care of their appearance and are obsessed with subtle or unperceived imperfections. They have pompous opinions of themselves and are often “name droppers.” They are prone to postoperative depression and dissatisfaction.
- **Histrionic patients** are emotional and have an intense need for attention. They have volatile emotional responses and may laugh or cry easily. They use their emotional displays to control others. They are usually noncompliant with instructions and late to appointments and may be difficult for staff to work with. During evaluation, a histrionic patient will seek praise, approval, and reassurance.
- **Schizoid patients** are socially withdrawn and eccentric. They are unable to maintain eye contact, have a flat affect, and are unable to relax during the evaluation. They make few comments and do not elaborate on their responses. They are vague and unable to give a specific goal for desiring cosmetic surgery. For example, a patient might explain the reason for desiring surgery as, “I just want to look that way.”

- Patients with a **paranoid personality** are preoccupied with suspicion and have unjustifiable cynicism about others. They present themselves as victims and blame others for any misfortune. They usually are secretive and can be argumentative and moralistic. During evaluation they may be very guarded and businesslike with difficulty relaxing.
- **Neurotic patients** are characterized by being exceptionally concerned or anxious, having somatic complaints. They usually ask multiple, repetitive questions and expect detailed, technical responses. They are often obsessed and well read about all possible complications. A neurotic patient will get very defensive if not addressed seriously. But, with reassurance and proper preoperative counseling, they are usually good surgical candidates and are happy with the results.

■ **Body dysmorphic disorder**
- Characterized by:
  - ► Preoccupation with slight or imagined flaws in appearance
  - ► Excessively time consuming
  - ► Results in a significant disruption of their lives
- Estimated incidence is 0.2% of the general population but **much higher (2%-7%) in patients requesting aesthetic surgery**
- The body as a whole or specific anatomic areas, such as the face, nose, ears, breasts, or genitals perceived as flaws
- Often think others are taking special notice of their imagined or slight deficits
- Take constant precautions to hide their focus of concern with clothing, makeup, and body position
- May accompany other disorders, including major depression, obsessive-compulsive disorder, and eating disorders

CAUTION: Patients with body dysmorphic disorder are rarely satisfied, and symptoms may be exacerbated with cosmetic surgery. Therefore cosmetic surgery is contraindicated, and patients should be referred for psychiatric care.

SENIOR AUTHOR TIP: A thorough evaluation of a patient's motivation and mental state, as described above, is essential and a predictor of patient behavior postoperatively. Turning down or referring patients for psychological evaluation is rare in my practice. Referral for evaluation has to be handled delicately so a patient does not have the impression that I think he or she is unstable. Turning down a patient also has to be handled with sensitivity. I tell the few patients I turn down that I am aware of their concerns but do not think I am able to address them to their satisfaction.

Physical Evaluation

- A patient's physical appearance must correlate with the health history.
- A focused physical examination of the area of concern, with objective documentation of any deviation from the aesthetic norm, is performed and appropriate measurements are obtained when possible.
- Adjacent anatomic areas are examined to determine whether they contribute to the aesthetic flaw.
- Patients seeking cosmetic surgery of the breasts or body should disrobe appropriately to allow a complete examination. Surgeons should be cautious with patients who will not disrobe to allow proper examination.

TIP: A chaperone should always be in the room during the physical examination of sensitive body areas.

- Any physical deformities, scars, flaws, or asymmetries are clearly identified to the patient and documented.

Rejection

- After psychological and physical evaluation, surgical eligibility can be decided (Fig. 1-1).

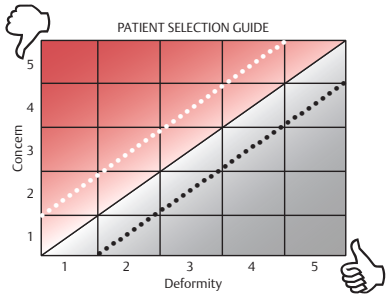


Fig. 1-1 Surgical eligibility guide. The vertical axis represents the degree of the patient's concern regarding the problem, from 1 (minimal) to 5 (maximal). The horizontal axis represents the surgeon's objective evaluation of the nature of the complaint, from 1 (minimal) to 5 (maximal). Most applicants are categorized within the area between the diagonal *dotted lines.* The closer to the upper left corner, the more likely the possibility of patient dissatisfaction regardless of quality of result. The converse is true of patients categorized in the lower right corner. From experience, we suggest keeping this scheme on the back page of each patient's record in simple diagrammatic form with no written explanation after the first visit. If a patient returns after researching other surgeons and websites, this record will help a surgeon or an associate remember original impressions. Experience shows that this helps to keep us out of trouble.

- **Aesthetic surgeons should refuse to proceed with surgery if:**
  - The aesthetic flaw is **not visible** to the surgeon.
  - The aesthetic flaw **cannot be corrected** by surgery.
  - The **risk of failure is greater than the risk of success.**
  - The **surgical goals are unclear.**
  - The patient has **unrealistic expectations.**
  - The patient's comorbidities deem them to be **unsafe** for elective surgery.
- Aesthetic surgeons should listen to their instincts and not proceed if they are uneasy about the patient or the surgery.
- For patients with unrealistic goals, surgeons should attempt to clarify that these results are not achievable.

TIP: To prevent confrontation, if a persistent patient insists on proceeding with surgery, the surgeon can claim that he or she is not able to achieve the desired results.

Preparing for Surgery

- **Effective communication** is critical in preventing disappointment postoperatively.
- Surgical options for achieving desired goals specific recommendations are given in a language that patients can easily understand.
- Patients are informed about what to expect after surgery.
  - Thorough counseling on all risks of the procedure
  - Clear description of the location and length of expected scars
  - Realistic timeline for recovery and downtime
  - Express guarantees should *not* be made.
  - All discussions documented, with detailed informed consent forms
- **Photography is an essential tool** for preoperative planning and documentation of surgical alteration.
  - It is the only postoperative record of a patient's preoperative appearance for comparison.
  - Photographs can be used to demonstrate the aesthetic deformity to the patient from multiple views that are not possible to observe in a mirror.

CAUTION: Surgeons should be cautious of patients who will not allow preoperative photographs to be taken.

- Preoperative imaging, testing, and/or medical clearance are arranged, as indicated.
- If appropriate, it may be necessary to see the patient again before operating to ensure understanding, review preoperative testing and consultation results, and answer additional concerns or questions.

SENIOR AUTHOR TIP: Patients like to have lists of dos and don'ts before surgery. Video imaging has proved a useful tool in my practice, not only to show patients what the anticipated result might be, but also to indicate to me the patient's expectations.

Most patients think that plastic surgery and cosmetic surgery in particular leave no scars! I emphasize the length and location of the scars while explaining that our goal is to place the scars to be least noticed.

OPERATIVE AND FOLLOW-UP CARE

The Day of Surgery

- **In the holding area**
  - The patient is examined and marked preoperatively.
    - ► Markings are made before patients are sedated.
    - ► Having a private room with a mirror where the patient can see and confirm the markings is helpful.
    - ► Additional photographs of the markings can be helpful.
  - Final questions about the procedure and recovery are answered.
  - The patient and accompanying family are reassured. It is normal for them to be nervous and have last-minute reservations.
  - All operative goals are restated.

SENIOR AUTHOR TIP: After explaining the procedure again, describing the scars, and marking the patient, I always ask if we left anything out. Are we adding anything? Too many patients wake up thinking they had less performed than they had requested, and some ask, while being prepped preoperatively, that we remove moles or undertake separate aesthetic procedures.

I always tell the family that I will personally come out and talk with or call them after the procedure. I also add that if we finish before the estimated time, it does not mean I rushed through the procedure, and if it takes longer, it does not mean that the patient or I had a problem. For long procedures or and those that take longer than scheduled, I ask the circulating nurse to call and update the family.

- **In the operating room**
  - The patient is covered to maintain modesty and provide warmth.
  - Soft music can have a calming effect and may help the patient relax before induction.
  - The waiting family is frequently given progress reports.
  - A clean and neat dressing is carefully applied to cover the surgical site.

SENIOR AUTHOR TIP: I always like to be in the operating room and if appropriate hold the patient's hand as anesthesia is being induced. A time-out is mandatory for all surgeries, even cosmetic ones.

- **After surgery**
  - Reassuring and talking with the patient in the recovery room is important.
  - The surgeon should visit the waiting spouse or family or call them if they are not readily available.
  - The patient is seen again before discharge or that evening in the room if he or she is staying overnight.
  - **Specific written and oral instructions are given.** Being repetitive with the patient and family is essential.
  - The patient is called that evening at home or in the hospital room.

Postoperative Care

- Patients are seen within 1 or 2 days or called at home postoperatively for a progress report.
- Surgeons should be present and perform the first dressing change if possible.
- Patients are reassured that wounds are healing normally.
- Patients are typically seen at 1, 3, 6, and 12 months, then annually, assuming no complications.
- Photos are obtained at 6-12 months postoperatively.
- Progress of long-term results is explained.

Recovery After Cosmetic Surgery

- **The "Healing Curve"**
  - Patients will not see their final results immediately.
  - Depending on the procedure, results become apparent in a week (injecting fillers) or up to 1 year (rhinoplasty).
  - Patients are informed of the expected time course for resolution before surgery and at each follow-up visit (Figs. 1-2 and 1-3).

- Edema and ecchymosis are to be expected after any procedure.
- Surgeons should give reassurance that results will continue to improve over time, as appropriate.
- **Emotional response**
  - ► Patients can be expected to feel different emotions as they recover from cosmetic surgery.
  - ► Listening to the patients' concerns and maintaining a calm demeanor to reassure them what is normal are essential.
  - ► Patients commonly feel a wide range of emotions in the postoperative period, characterized by the following commonly heard comments:
    - ◆ **Week 1:** "I wish it was a month from now."
      - – Days 1-3: "I'm beat." Patient is exhausted, sleepy.
      - – Days 4-7: "What did I do?" Patient is sad, irritated, angry.
    - ◆ **Week 2:** "You should have told me about. . ." Patient is critical, nitpicky, scared, impatient, complaining.
    - ◆ **Week 3:** "Not too bad. . ." Patient begins to normalize and see results.
    - ◆ **Weeks 4-5:** "You look great." Patient notices others' reactions and compliments and begins to feel good about surgery.
    - ◆ **Weeks 6-8:** "But what about. . ." As most of the swelling and bruising resolve, some focal areas may lag in recovery or may not appear as expected.
    - ◆ **Weeks 8-12:** "Wow, I love it."
    - ◆ **After 3-6 months:** "What's next?"

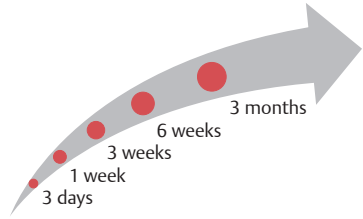


Fig. 1-2 Physical recovery. Times may vary depending on the procedure.

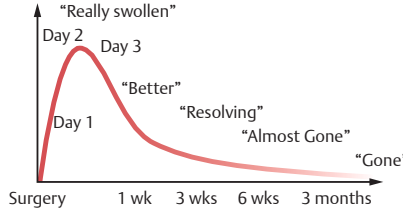


Fig. 1-3 Edema curve. The time range may vary depending on the procedure.

SENIOR AUTHOR TIP: Surgeons should be supportive with patients who have a complication or delayed recovery, seeing and calling them often, and explaining the course of their care as the problem resolves. I reassure patients with complications that we will see them through it, and that in all likelihood it will not affect the final result.

Maintenance Counseling

- **Maintenance counseling** will improve patient satisfaction in the long term and allow patients to be a partner in the aesthetic improvement process.
- Keeping a healthy lifestyle and sustaining good habits will augment the results of cosmetic procedures beyond what can be achieved surgically.
- Information for physical training and nutritional counseling is provided, if needed.
- **A skin care regimen for facial procedures is essential** in enhancing the results and preserving longevity.

Revisions

- A clear, documented revision policy should be agreed on **before surgery.**
- Adequate time for healing and resolution of edema is allowed before considering revision. The following timeframes are useful guidelines:
  - **Body contouring:** Wait at least 6 months
  - **Rhinoplasty:** Wait at least 12 months
  - **Blepharoplasty:** Wait 3-6 months
  - **Facelift:** Wait 6-12 months
  - **Breast:** Wait at least 3 months
- Surgeons should "see" and clearly understand what needs to be revised and the expected goals of revision.
- Patients should have **realistic expectations** of what can be achieved with a revision.

Top Takeaways

- Contrary to the perception of most patients, aesthetic surgery and cosmetic medicine is not a commodity. It is a very personal service based on a professional relationship between the patient and surgeon—a partnership based on mutual trust, mutual respect, and a common goal.
- As surgeons, we have different personalities, bedside manners, experience, surgical skills, and aesthetic sense.
- Our patients are also as varied as we are, with different personalities and differing expectations.
- Most patients shop around and pick a surgeon based on price, reputation, bedside manner, and qualifications, usually in that order. In short, they choose a surgeon they are "comfortable" with. Similarly, operating on patients with whom we are not comfortable or have not established rapport preoperatively will lead to a difficult postoperative course if problems occur.

References

1. 2016 Cosmetic Surgery National Databank Statistics. American Society for Aesthetic Plastic Surgery. Available at *http://www.surgery.org/sites/default/files/ASAPS-Stats2016.pdf.*
2. 2015 Plastic Surgery Statistics Report. American Society of Plastic Surgeons. Available at *https://d2wirczt3b6wjm.cloudfront.net/News/Statistics/2015/plastic-surgery-statistics-full-report-2015.pdf.*
3. Rohrich RJ. Streamlining cosmetic surgery patient selection—just say no! Plast Reconstr Surg 104:220, 1999.
4. Rohrich RJ. The who, what, when, and why of cosmetic surgery: do our patients need a preoperative psychiatric evaluation? Plast Reconstr Surg 106:1605, 2000.
5. Gorney M. Recognition and management of the patient unsuitable for aesthetic surgery. Plast Reconstr Surg 126:2268, 2010.
6. Ferraro GA, Rossano F, D'Andrea F. Self-perception and self-esteem of patients seeking cosmetic surgery. Aesthetic Plast Surg 29:184, 2005.
7. Nahai F. Evaluating the cosmetic patient on antidepressants. Aesthet Surg J 34:326, 2014.
8. Nahai F. What is aesthetic surgery, anyway? Aesthet Surg J 30:874, 2010.
9. Nahai F, ed. The Art of Aesthetic Surgery: Principles and Techniques, ed 2. New York: Thieme Publishers, 2010.

2. The Artistry of Plastic Surgery

Sumeet Sorel Teotia, Mark B. Constantian

Nature's paradigm for survival relies to a great extent on the concept of *beauty.* Ultimately, evolution requires successful survival of a species, animal or plant, through nature's own rules of beauty: harmony, balance, and symmetry. An overarching study of beauty lends itself to the philosophical comprehension of *aesthetics*—a field dedicated to the art and understanding of beauty and good taste. Thus the study of beauty through scientific methods is an effort toward explaining aesthetics.

AESTHETICS AND ITS ASSOCIATION

- Often refers to the study and philosophy of **beauty** and **taste**
- Origin from Greek word, *aisthetikos,* implying "sensitive, relating to perception of the sense," which in turn derives from *aisthánomai,* implying "I sense and feel."
- The field of aesthetics—thus our understanding of beauty—changes in each stage of human civilization and evolution.
  - What is acceptable as the "ideal" beauty has evolved.
  - Classical female beauty is much different from the "cover girl" concepts of beauty of the modern world, which influence aesthetic medicine.
- **Aesthetic medicine** comprises several disciplines whose goal is **to improve the cosmetic appearance of patients.**
  - The rise of aesthetic medicine and surgery in modern times has an increasing relationship to the science of aesthetic medicine and the safety of invasive and noninvasive procedures.
  - Social acceptance of aesthetic procedures continues to evolve among the sexes and various cultures.
  - Clinical and psychological studies have shown an **overall sense of well-being** of patients who seek aesthetic procedures.[1-3]

BEAUTY AND ITS CONCEPTS

Ancient Concepts in Beauty

- Symbols of ancient beauty can be found in early civilizations such as Egypt and Troy and are unavoidable when we study Western beauty.
  - Arguably, some modern concepts of beauty were influenced by what we think was considered beautiful in ancient Egypt.
  - Two most powerful and ubiquitous symbols of Western beauty originate from two queens of antiquity: Cleopatra and Nefertiti.
    - **Cleopatra** has been known as the paragon of beauty, ever since Roman conquest of Egypt.

Fig. 2-1 Bust of Nefertiti.

- ► **Nefertiti's** emergence came after her painted bust was discovered in 1912.
  - ◆ She was the little-known wife of Pharaoh Akhenaten.
  - ◆ The logo for the American Society for Aesthetic Plastic Surgery (ASAPS) is Nefertiti (Fig. 2-1).
- Ancient Egyptians provided vast information indicating that both sexes went to great lengths to improve their appearance.
  - ► Based on ubiquitous beauty products left by ancient Egyptians in burial and around mummies
    - ◆ Use of **kohl** as eye makeup in ancient Egypt perhaps gave rise to the smoky eye makeup worn today.
    - ◆ Kohl, a mineral base composed of lead, may have antibacterial properties.
    - ◆ Perhaps the use of kohl by both sexes was to reduce glare from the sun, thus providing not only a function, but also beauty.
- The **symbolism** of beauty perhaps is even more powerful than the subject itself, even when we consider "beauty" in ancient terms.
  - ► Plutarch (ancient Greek philosopher) described Cleopatra as having a strong voice and vivacity, and not necessarily beauty.
  - ► On ancient coins, Cleopatra is depicted as having a big nose, protruding chin, and wrinkled face—hardly what one would call *beautiful* in any era.
  - ► Yet we have decided that "Cleopatra" represents a powerful message for beauty.

■ Ancient Greeks described what we know as earliest Western theories of beauty:
- Pre-Socratic philosophers such as **Pythagorus** offered concepts of beauty in mathematical terms.
- Pythagoreans saw an innate connection between beauty and mathematics.
  - ► They noted that the **"golden ratio"** embodied proportions considered to be beautiful.
- Early Greek architecture relied on establishing **symmetry** and **proportion,** thereby evoking harmony and beauty, and Aristotle saw that the goal of virtue was to obtain beauty.
- **Euclid,** a Greek mathematician, recorded in his treatise, *Elements,* the definition of *golden ratio:*
  - ► He described cutting a line "in extreme and mean ratio"—what we now call the *golden ratio.*

Golden Ratio

■ Also known as the *golden mean* or *golden proportion*

■ Mathematically, two quantities are in the **golden ratio** if their **ratio** is the same as the ratio of their **sum** to the larger of the two quantities.
- In algebra, for any numbers *a* and *b* with a>b>0, the golden ratio is:

$$(a + b)/a = a/b = \phi$$

- The golden ratio can be geometrically described using the golden rectangle, and thus is easier to understand (Fig. 2-2).

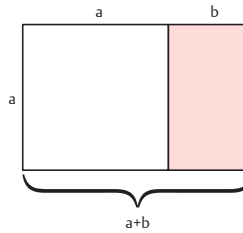


Fig. 2-2 The golden rectangle generates the golden ratio, phi (Φ). A golden rectangle consists of a square and a rectangle. The square (white) has four sides with a length of 'a.' The rectangle (red) has two sides with lengths of 'a' and two sides with lengths of 'b.' When the rectangle is placed next to the square with both 'a' lengths adjacent, the two shapes together generate a golden rectangle. In the golden rectangle, side 'a+b' and side 'a' generate phi (Φ).

- In decimal system, the golden ratio is represented by 1.6180339887498948482 . . .
- Mark Barr, a twentieth-century mathematician, proposed ϕ to designate the golden mean, based on Greek sculptor **Phidias**, who is credited as having built the Parthenon.
- The **platonic solids** (cube, tetrahedron, octahedron, dodecahedron, and icosahedron) have some correlation to the golden ratio.
- **Fibonacci numbers** also reflect and are intimately connected with the golden ratio
  - ► Fibonacci, also known as *Leonardo of Pisa,* was an Italian mathematician, who in 1202 in his book *Liber Abaci* introduced the number sequence named after him.
  - ► The Fibonacci numbers are integers in the following sequence, known as *the Fibonacci sequence:*
    - ◆ 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144 . . .
    - ◆ These numbers are defined by the following recurrence relation:

$$F_n = F_{n-1} + F_{n-2}$$

  - ► Besides use in theoretical mathematics, Fibonacci numbers, in conjunction with golden ratio, are extremely popular and have been used in various fields, including art, music, sculpture, and architecture.
  - ► Fibonacci sequences appear in nature (Fig. 2-3):
    - ◆ Leaf arrangement on a stem
    - ◆ Pineapple fruitlets
    - ◆ Artichoke flowering
    - ◆ Pine cone arrangement

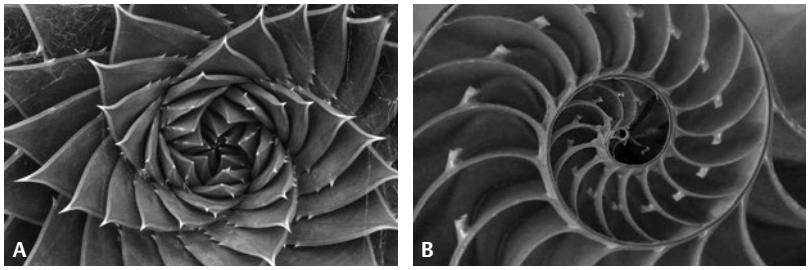


Fig. 2-3 Fibonacci sequences in nature. **A,** Fibonacci leaf pattern in nature. **B,** Cross section of nautilus depicting Fibonacci spiral.

- Luca Pacioli, Italian mathematician of Renaissance period and a colleague of Leonardo da Vinci, explored the mathematics of golden ratio as it related to art.
  - ► Published *De Divina Proportione* (The Divine Proportion) in 1509; defined *golden ratio* as the "divine proportion"[4]

- ► Leonardo da Vinci was the illustrator of the book
- ► Description of golden ratio was tied to Vitruvian explanation of proportion (see Fig. 2-4).

The Vitruvian Man

- The *Vitruvian Man,* by Leonardo da Vinci, was inspired by writings of **Marcus Vitruvius Pollio**, an ancient Roman architect and engineer.
  - Pen and ink drawing interpreting Vitruvius' work on proportions of human body, created circa 1490 (Fig. 2-4)
  - da Vinci drew various drawings for Pacioli's book, and they often collaborated.

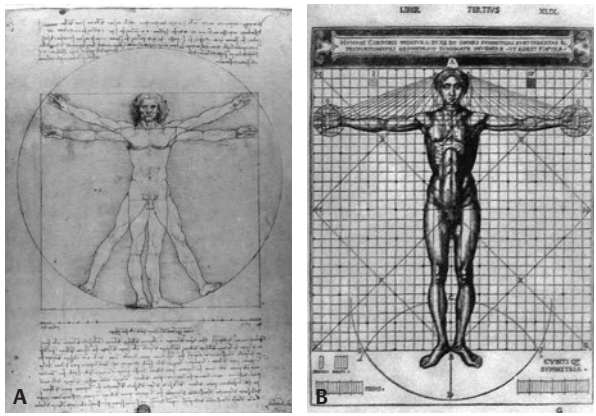


Fig. 2-4 Vitruvian Man.

- Many refer to this drawing as "the proportion of man."
- Even though the drawing has been connected with the golden ratio, the proportions of the figure in reality do not match 1.618033 . . . and da Vinci only mentioned whole number ratios.
- The drawing is based on ideal geometric human proportions as related to geometric principles outlined by Vitruvius in his extensive treatise, *De Architectura.*[5]
- He determined that the **human body** is the principle source of proportion among the classical order of architecture.
  - Vitruvius asserted that a structure must have qualities of *firmitas, utilitas,* and *venustas*—solidness, usefulness, and beauty, known as **Vitruvian Triad.**
  - Vitruvius defined the Vitruvian Man to have the ideal proportions, because the Greeks thought the human form was the greatest work of art.
  - Vitruvius wrote about the proportion of man:
    - ► *"Just so the parts of Temples should correspond with each other, and with the whole. The navel is naturally placed in the centre of the human body, and, if in a man lying with his face upward, and his hands and feet extended, from his navel as the centre, a circle be described, it will touch his fingers and toes. It is not alone by a circle, that the human body is thus circumscribed, as may be seen by placing it within a square. For measuring from the feet to the crown of the head, and then across the arms fully extended, we find the latter measure equal to the former; so that lines at right angles to each other, enclosing the figure, will form a square."*

- The following text is stated above and below da Vinci's drawing:
  - Above: *"Vetruvio, architect, puts in his work on architecture that the measurements of man are in nature distributed in this manner, that is:*
    - *A palm is four fingers*
    - *A foot is four palms*
    - *A cubit is six palms*
    - *Four cubits make a man*
    - *A pace is four cubits*
    - *A man is 24 palms*
    - *And these measurements are in his buildings"*
  - Below:
    - *The length of the outspread arms is equal to the height of a man.*
    - *From the hairline to the bottom of the chin is one tenth the height of a man.*
    - *From below the chin to the top of the head is one eighth the height of a man.*
    - *From above the chest to the top of the head is one sixth the height of a man*
    - *From above the chest to the hairline is one seventh the height of a man.*
    - *The maximum width of the shoulders is a fourth the height of a man.*
    - *From the breasts to the top of the head is a fourth the height of a man.*
    - *The distance from the elbow to the tip of the hand is a fourth the height of a man.*
    - *The distance from the elbow to the armpit is an eighth the height of a man.*
    - *The length of the hand is a tenth the height of a man.*
    - *The root of the penis is at half the height of a man.*
    - *The foot is a seventh the height of a man.*
    - *From below the foot to below the knee is a fourth the height of a man.*
    - *From below the knee to the root of the penis is a fourth the height of a man.*
    - *The distances from below the chin to the nose and the eyebrows and the hairline are equal to the ears and to a third of the face.*
- da Vinci's figure and interpretation of Vitruvius' work set the tone for future classical painters who were inspired by representing nature's perfection in proportion. The often-idealized figures of Renaissance painters represented the Greek ideals of symmetry, harmony, and form as they related to the human figure.

Classical Concepts in Beauty

- The ideals of human beauty described by ancient Greek philosophers were rediscovered during the Renaissance.
- The definition of *classical beauty* arose from this reemergence.
- The "classical ideal" refers to readoption of ancient Greek idealism and the study of nature.
  - Studied and redefined through imitating ancient Greek sculptures of men and women
- "Classical beauty" is a woman who conforms to the standard Greek classical ideal, with proportion and symmetry as it relates to nature's ideal, and not necessarily "mankind's ideal."
- One such female classical ideal was the famous statue, **Venus de Milo** (Fig. 2-5).
  - The statue of Venus de Milo is marble and exhibited in Paris, France, at the Louvre.

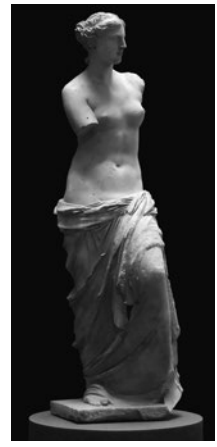


Fig. 2-5 Venus de Milo.

- Also known as *Aphrodite of Milo* in Greek; thought to be sculpted around 100 BC by Alexandros of Antioch
  - ► *Aphrodite:* Greek goddess of love and beauty
- Discovered by a peasant in the island of Milos in 1820
- Formerly, logo of the journal **Plastic and Reconstructive Surgery** and the seal of **American Society of Plastic Surgeons (ASPS)**[6]:
  - ► Designed by Charles Liedl, an artist and friend to Gustave Aufricht
  - ► Venus de Milo became part of ASPS during Aufricht's presidency of the Society (1944-1946).

SENIOR AUTHOR COMMENTARY: *"Just so the parts of Temples should correspond with each other, and with the whole."*

This principle articulated by Vitruvius and quoted above is key because it relies on internal aesthetics (i.e., the relationship of one part to another) rather than external ones (i.e., the relationship of one part to an external absolute). In practice, the surgeon may be guided by each of the principles described above, but at some point a compromise has to be made between what is desired and what is achievable. We never work with the anatomy that we would like, but rather the anatomy that we have been given. Rarely do neoclassical canons follow the surgeon into the operating room.

Actually, most evidence indicates that these canons do not even apply very often outside the arts. Farkas and his co-authors[7-10] assessed these ideals in white, black, and Chinese populations, and found that they rarely existed.[11] When Farkas tested "attractive" and "average" faces in North American populations against the canons, none conformed to them.

It actually appears that three components of facial attractiveness are critical: *averageness, symmetry,* and *neoteny* (juvenile features in an adult).

Averageness indicates similarity to a typical phenotype for a group and therefore signals genetic diversity (and presumably greater health and disease resistance).

Symmetry seems obvious as a characteristic of attractiveness; in fact, studies across a number of species have shown that less fluctuating asymmetry (that is, greater symmetry) is associated with both fitness and fertility.

Interestingly, it is not simple youthfulness but *neoteny* that is particularly associated with facial attractiveness. A baby's features (large eyes, small nose, round cheeks, smooth skin, glossy hair, and lighter skin tones) correlate with greater perceived attractiveness, more paternal attention, and even a lower incidence of childhood abuse. The preference for childlike facial features appears consistently across ethnic populations, regardless of sexual orientation.[9,10]

Attractiveness is also related to sexual dimorphism—that is, the degree to which a particular face resembles the prototype of his or her sex. In men, this means larger jaws and supraorbital ridges; more prominent cheekbones; smaller eyes; thinner lips; and wider, larger noses. In women, dimorphism implies prominent cheekbones; smooth, hairless skin; wider eyes; higher, thinner eyebrows; smaller jaws; fuller lips; and shorter, smaller noses. Therefore, although facial attractiveness may not always conform to *phi* or other mathematical proportions, it still derives from species-specific psychological adaptations.[11]

One of my favorite neoclassical canons not mentioned above dictates that, "the distance between the eyes equals the width of the nose." Farkas and co-authors[7,8] determined that this ideal actually occurs in only 41% of whites, 35% of Han Chinese, and only 3% of blacks. I have treated many patients in whom well-meaning surgeons tried to follow this rule and instead produced lower noses that were now disproportionately narrow for the widths of the patients' tips or bony vaults.

Therefore, when confronted with a patient whose interalar width exceeds his or her intercanthal distance and in whom narrowing would produce an unaesthetic result, these are the surgeon's practical choices:

Reduce the alar base anyway and accept a distorted result;
Move the orbits laterally; or
Ignore the rule.

I always choose the last one.

Ideal proportions and indices are harmonious and lovely—for painters and sculptors. Individual human anatomy gives much less room for surgeons to follow—and it should be our patients themselves who dictate what is normal and what they wish to change, not us. Surgeons' right brains can still guide them to optimal proportions and shapes that fit the patient's canons, the only ones that really count.

Top Takeaways

- Concept of beauty exists within nature's paradigm for survival
- Aesthetics is the field of understanding beauty.
- Historical scholars have given us the golden ratio as a means to study patterns in nature, art, mathematics and beauty.
- Plastic surgeons adapt themselves to study form and function of the human body and dedicate their careers to refine aesthetic results in both cosmetic and reconstructive surgery.
- Artistry in plastic surgery comes from a lifetime of dedication, education, and immersion in improving results that produce harmony.

References

1. Saariniemi KM, Helle MH, Salmi AM, et al. The effects of aesthetic breast augmentation on quality of life, psychological distress, and eating disorder symptoms: a prospective study. Aesthetic Plast Surg 36:1090, 2012.
2. Saariniemi KM, Salmi AM, Peltoniemi HH, et al. Does liposuction improve body image and symptoms of eating disorders? Plast Reconstr Surg Glob Open 3:e461, 2015.
3. Saariniemi KM, Salmi AM, Peltoniemi HH, et al. Abdominoplasty improves quality of life, psychological distress, and eating disorder symptoms: a prospective study. Plast Surg Int 2014:197232, 2014.
4. O'Connor JJ, Robertson EF. "Luca Pacioli." School of Mathematics and Statistics. University of St Andrews, 1999.
5. Rowland I, Howe TN, eds. Vitruvius. Ten Books on Architecture. Cambridge, UK: Cambridge University Press, 1999.

6. Brent B. The reconstruction of Venus: following our legacy. Plast Reconstr Surg 121:2170, 2008.
7. Farkas LG, Forrest CR, Litsas L. Revision of neoclassical facial canons in young adult Afro-Americans. Aesthetic Plast Surg 24:179, 2000.
8. Farkas LG, Hreczko TA, Kolar JC, et al. Vertical and horizontal proportions of the face in young adult North American Caucasians: revision of neoclassical canons. Plast Reconstr Surg 75:328, 1985.
9. Bashour M. History and current concepts in the analysis of facial attractiveness. Plast Reconstr Surg 118:741, 2006.
10. Bashour M. An objective system for measuring facial attractiveness. Plast Reconstr Surg 118:757, 2006.
11. Constantian MB. Rhinoplasty: Craft and Magic. New York: Thieme Publishers, 2009.

3. Photography for the Aesthetic Surgeon

Amanda Behr, Patricia Aitson, William Y. Hoffman

STANDARDIZED CLINICAL PHOTOGRAPHY

Photography is one of the most useful tools to plastic surgeons, but it can also be one of the most fallible tools. Quality clinical photography requires organization and adherence to a standard set of protocols. Lens magnification, lighting, patient preparation and positioning must all be consistent to ensure the accuracy of comparative photography. The following guidelines can help maintain consistency in photographic documentation.

TIP: A standardized procedure saves time: decisions are largely predetermined by an existing set of rules.[1] Standardization requires planning, a systematic approach, adherence to protocols, and attention to detail.[2,3]

ELEMENTS OF STANDARDIZED CLINICAL PATIENT PHOTOGRAPHY

- **Consistent focal lengths and distances**
  - **Focal length** (measured in millimeters) determines how the lens brings an object into focus.
    - ► Longer focal length = higher magnification
    - ► Shorter focal length = lower magnification
  - **Focal distance** is the distance from the camera lens to the object being photographed.
  - Reference the **Cardiff Scales of Reproduction**[4] for guidelines.
- **Consistent lighting**
  - Use of dual strobe flashes in clinical setting
- **Standardized series** (a predetermined set of photographs per procedure)
  - Ensures patients will have the same views photographed each time
- Attention to detail
  - Remove jewelry, glasses, heavy makeup
  - Keep area clean
  - Use of background
- **Informed consent** is necessary before photographs can be taken.