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OF OPHTHALMOLOGY

13

Refractive Surgery

2017–2018
BCSC
Basic and Clinical
Science Course™



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Printed in the United States of America.

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Louis B. Cantor, MD, Indianapolis, Indiana, *Senior Secretary for Clinical Education*

Christopher J. Rapuano, MD, Philadelphia, Pennsylvania, *Secretary for Lifelong Learning and Assessment*

George A. Cioffi, MD, New York, New York, *BCSC Course Chair*

Section 13

Faculty

M. Bowes Hamill, MD, *Chair*, Houston, Texas

Gregg J. Berdy, MD, St Louis, Missouri

Richard S. Davidson, MD, Denver, Colorado

Parag A. Majmudar, MD, Chicago, Illinois

Sherman W. Reeves, MD, MPH, Minnetonka, Minnesota

Neda Shamie, MD, Century City, California

George O. Waring IV, MD, Charleston, South Carolina

Renato Ambrósio Jr, MD, PhD, *Consultant*, Rio de Janeiro, Brazil

The Academy wishes to acknowledge the *American Society of Cataract and Refractive Surgeons (ASCRS)* for recommending faculty members to the BCSC Section 13 committee.

The Academy also wishes to acknowledge the following committees for review of this edition:

Committee on Aging: Jean R. Hausheer, MD, Lawton, Oklahoma; Sumitra S. Khandelwal, MD, Houston, Texas

Vision Rehabilitation Committee: Deepthi M. Reddy, MD, Houston, Texas

Practicing Ophthalmologists Advisory Committee for Education: Bradley D. Fouraker, MD, *Primary Reviewer*, Tampa, Florida; Edward K. Isbey III, *Chair*, Asheville, North Carolina; Alice L. Bashinsky, MD, Asheville, North Carolina; David J. Browning, MD, PhD, Charlotte, North Carolina; Steven J. Grosser, MD, Golden Valley, Minnesota; Stephen R. Klappper, MD, Carmel, Indiana; James A. Savage, MD, Memphis, Tennessee; Michelle S. Ying, MD, Ladson, South Carolina



European Board of Ophthalmology: Jesper Hjortdal, MD, PhD, *EBO Chair*, Aarhus, Denmark; Marie-José Tassignon, MD, PhD, FEBO, *EBO Liaison*, Antwerp, Belgium; Roberto Bellucci, MD, Verona, Italy; Daniel Epstein, MD, PhD, Bern, Switzerland; José L. Güell, MD, FEBO, Barcelona, Spain; Markus Kohlhaas, MD, Dortmund, Germany; Rudy M.M.A. Nuijts, MD, PhD, Maastricht, the Netherlands

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Dr Isbey: Alcon (S), Bausch + Lomb (S), Medflow (C), Oculos Clinical Research (S)

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Dr Majmudar: Alcon (C), Allergan (C), Bausch + Lomb (C), CXL Ophthalmics (O), Rapid Pathogen Screening (O), TearScience (C, S)

Dr Nuijts: Alcon Laboratories (L, S), ASICO (P), Bausch + Lomb (C)

Dr Reeves: Abbott Medical Optics (C), Allergan (C), Bausch + Lomb (C)

Dr Savage: Allergan (L)

Dr Shamie: Abbott Medical Optics (C), Alcon (C), Allergan (C, L), Bausch + Lomb (C, L), Bio-Tissue (C), Merck & Co (C, L), Shire (C), Tissue Bank International (C)

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Omega Ophthalmics (C), Perfect Lens (C), Refocus Group (C), RevitalVision (C), Strathspey Crown (O), Visiometrics (C)

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Recent Past Faculty

Elizabeth A. Davis, MD
Eric D. Donnenfeld, MD
J. Bradley Randleman, MD
Christopher J. Rapuano, MD
Steven I. Rosenfeld, MD
Donald T.H. Tan, MD
Brian S. Boxer Wachler, MD

In addition, the Academy gratefully acknowledges the contributions of numerous past faculty and advisory committee members who have played an important role in the development of previous editions of the Basic and Clinical Science Course.

American Academy of Ophthalmology Staff

Dale E. Fajardo, *Vice President, Education*
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American Academy of Ophthalmology
655 Beach Street
Box 7424
San Francisco, CA 94120-7424

Contents

- General Introduction xiii
- Objectives 1**
- Introduction 3**
- 1 The Science of Refractive Surgery 7**
 - Corneal Optics 7
 - Refractive Error: Optical Principles and Wavefront Analysis 9
 - Measurement of Wavefront Aberrations and Graphical Representations 9
 - Lower-Order Aberrations 11
 - Higher-Order Aberrations 11
 - Corneal Biomechanics 13
 - Corneal Imaging for Keratorefractive Surgery 14
 - Corneal Topography 14
 - Corneal Tomography 19
 - Indications for Corneal Imaging in Refractive Surgery 22
 - The Role of Corneal Topography in Refractive Surgery 24
 - Corneal Effects of Keratorefractive Surgery 26
 - Incisional Techniques 26
 - Tissue Addition or Subtraction Techniques 27
 - Alloplastic Material Addition Techniques 28
 - Collagen Shrinkage Techniques 28
 - Laser Biophysics 29
 - Laser-Tissue Interactions 29
 - Fundamentals of Excimer Laser Photoablation 29
 - Types of Photoablative Lasers 30
 - Corneal Wound Healing 32
- 2 Patient Evaluation 35**
 - Patient History 35
 - Patient Expectations 35
 - Social History 36
 - Medical History 37
 - Pertinent Ocular History 37
 - Patient Age, Presbyopia, and Monovision 38
 - Examination 39
 - Uncorrected Visual Acuity and Manifest and Cycloplegic Refraction 39
 - Pupillary Examination 40

Ocular Motility, Confrontation Fields, and Ocular Anatomy	41
Intraocular Pressure	41
Slit-Lamp Examination	41
Dilated Fundus Examination	44
Ancillary Tests	44
Corneal Topography.	44
Pachymetry	45
Wavefront Analysis	46
Calculation of Residual Stromal Bed Thickness After LASIK	46
Discussion of Findings and Informed Consent	46
3 Incisional Corneal Surgery	49
Incisional Correction of Myopia	49
Radial Keratotomy in the United States	49
Incisional Correction of Astigmatism	53
Coupling.	54
Arcuate Keratotomy and Limbal Relaxing Incisions	54
Instrumentation	55
Surgical Techniques	55
Outcomes	57
Complications	58
Ocular Surgery After Arcuate Keratotomy and Limbal Relaxing Incisions	58
4 Onlays and Inlays	59
Keratophakia.	59
Homoplastic Corneal Inlays	60
Alloplastic Corneal Inlays	60
Epikeratoplasty	62
Intrastromal Corneal Ring Segments	62
Background	62
Instrumentation	63
Technique	64
Outcomes	64
Intracorneal Ring Segments and Keratoconus	65
Number of Segments	66
Complications	67
Ectasia After LASIK	70
Other Considerations With Intrastromal Corneal Ring Segments and LASIK	70
Orthokeratology	70
5 Photoablation: Techniques and Outcomes	73
Excimer Laser	73
Background	73
Surface Ablation	74

LASIK 76

Wavefront-Guided, Wavefront-Optimized, and Topography-Guided Ablations 76

Patient Selection for Photoablation 77

Special Considerations for Surface Ablation 77

Special Considerations for LASIK 78

Surgical Technique for Photoablation 80

Calibration of the Excimer Laser 80

Preoperative Planning and Laser Programming 81

Preoperative Preparation of the Patient 81

Preparation of the Bowman Layer or Stromal Bed for Excimer Ablation 82

Application of Laser Treatment 91

Immediate Postablation Measures 92

Postoperative Care 93

Refractive Outcomes 95

Outcomes for Myopia 95

Outcomes for Hyperopia 96

Wavefront-Guided, Wavefront-Optimized, and Topography-Guided Treatment Outcomes for Myopia and Hyperopia 97

Re-treatment (Enhancements) 97

6 Photoablation: Complications and Adverse Effects . . . 101

General Complications Related to Laser Ablation 101

Overcorrection 101

Undercorrection 102

Optical Aberrations 102

Central Islands 103

Decentered Ablations 104

Corticosteroid-Induced Complications 104

Central Toxic Keratopathy 105

Infectious Keratitis 106

Complications Unique to Surface Ablation 107

Persistent Epithelial Defects 107

Sterile Infiltrates 108

Corneal Haze 108

Complications Unique to LASIK 110

Microkeratome Complications 110

Epithelial Sloughing or Defects 112

Flap Striae 112

Traumatic Flap Dislocation 115

LASIK-Interface Complications 116

Complications Related to Femtosecond Laser LASIK Flaps 122

Ectasia 124

Rare Complications 125

7	Collagen Shrinkage and Crosslinking Procedures	127
	Collagen Shrinkage	127
	Laser Thermokeratoplasty	127
	Conductive Keratoplasty	128
	Corneal Crosslinking	130
	Patient Selection	131
	Surgical Technique	132
8	Intraocular Refractive Surgery	137
	Phakic Intraocular Lenses	138
	Background	138
	Advantages	138
	Disadvantages	138
	Patient Selection	140
	Surgical Technique	141
	Outcomes	144
	Complications	145
	Refractive Lens Exchange	147
	Advantages	147
	Disadvantages	147
	Patient Selection	147
	Surgical Planning and Technique	149
	Intraocular Lens Power Calculations in Refractive Lens Exchange	150
	Complications	151
	Monofocal Intraocular Lenses	151
	Toric Intraocular Lenses	151
	Patient Selection	151
	Planning and Surgical Technique	151
	Outcomes	152
	Complications Specific to Toric Intraocular Lenses	153
	Light-Adjustable Intraocular Lenses	153
	Accommodating Intraocular Lenses	154
	Multifocal Intraocular Lenses	155
	Patient Selection	155
	Surgical Technique	155
	Outcomes	155
	Adverse Effects, Complications, and Patient Dissatisfaction	
	With Multifocal Intraocular Lenses	156
	Bioptics	157
9	Accommodative and Nonaccommodative	
	Treatment of Presbyopia	159
	Introduction	159
	Theories of Accommodation	159
	Accommodative Treatment of Presbyopia	162
	Scleral Surgery	162
	Accommodating Intraocular Lenses	163

Nonaccommodative Treatment of Presbyopia	164
Monovision	164
Conductive Keratoplasty	165
Multifocal Intraocular Lens Implants	165
Custom or Multifocal Ablations	167
Corneal Intrastromal Femtosecond Laser Treatment	168
Corneal Inlays	169
Other Intraocular Lens Innovations on the Horizon	170
10 Refractive Surgery in Ocular and Systemic Disease	171
Introduction	171
Ocular Conditions	172
Ocular Surface Disease	172
Herpes Simplex Virus Infection	173
Keratoconus	175
Other Corneal Dystrophies	178
Post–Penetrating Keratoplasty	178
Ocular Hypertension and Glaucoma	180
Retinal Disease	183
Amblyopia and Strabismus in Adults and Children	185
Systemic Conditions	188
Human Immunodeficiency Virus Infection	188
Diabetes Mellitus	190
Connective Tissue and Autoimmune Diseases	191
11 Considerations After Refractive Surgery	193
Intraocular Lens Calculations After Refractive Surgery	193
Eyes With Known Pre- and Post–Refractive Surgery Data	194
Eyes With No Preoperative Information	195
The ASCRS Online Post-Refractive Intraocular Lens Power Calculator	195
Retinal Detachment Repair After LASIK	197
Corneal Transplantation After Refractive Surgery	197
Contact Lens Use After Refractive Surgery	198
Indications	198
General Principles	199
Contact Lenses After Radial Keratotomy	199
Contact Lenses After Surface Ablation	200
Contact Lenses After LASIK	200
Glaucoma After Refractive Surgery	200
12 Emerging Technologies	203
Refractive Lenticule Extraction	203
Indications and Preoperative Evaluation	204
Surgical Technique	204
Outcomes	205
Complications	205

Re-treatment After SMILE	206
Comparison With LASIK	206
Corneal Crosslinking Plus Refractive Procedures	206
Photorefractive or Phototherapeutic Keratectomy and Corneal Crosslinking	206
Intracorneal Ring Segment Implantation and Corneal Crosslinking	207
Phakic Intraocular Lens Implantation and Corneal Crosslinking	207
Basic Texts	209
Related Academy Materials	211
Requesting Continuing Medical Education Credit	213
Study Questions	215
Answer Sheet for Section 13 Study Questions	223
Answers	225
Index	231

General Introduction

The Basic and Clinical Science Course (BCSC) is designed to meet the needs of residents and practitioners for a comprehensive yet concise curriculum of the field of ophthalmology. The BCSC has developed from its original brief outline format, which relied heavily on outside readings, to a more convenient and educationally useful self-contained text. The Academy updates and revises the course annually, with the goals of integrating the basic science and clinical practice of ophthalmology and of keeping ophthalmologists current with new developments in the various subspecialties.

The BCSC incorporates the effort and expertise of more than 90 ophthalmologists, organized into 13 Section faculties, working with Academy editorial staff. In addition, the course continues to benefit from many lasting contributions made by the faculties of previous editions. Members of the Academy Practicing Ophthalmologists Advisory Committee for Education, Committee on Aging, and Vision Rehabilitation Committee review every volume before major revisions. Members of the European Board of Ophthalmology, organized into Section faculties, also review each volume before major revisions, focusing primarily on differences between American and European ophthalmology practice.

Organization of the Course

The Basic and Clinical Science Course comprises 13 volumes, incorporating fundamental ophthalmic knowledge, subspecialty areas, and special topics:

- 1 Update on General Medicine
- 2 Fundamentals and Principles of Ophthalmology
- 3 Clinical Optics
- 4 Ophthalmic Pathology and Intraocular Tumors
- 5 Neuro-Ophthalmology
- 6 Pediatric Ophthalmology and Strabismus
- 7 Orbit, Eyelids, and Lacrimal System
- 8 External Disease and Cornea
- 9 Intraocular Inflammation and Uveitis
- 10 Glaucoma
- 11 Lens and Cataract
- 12 Retina and Vitreous
- 13 Refractive Surgery

In addition, a comprehensive Master Index allows the reader to easily locate subjects throughout the entire series.

References

Readers who wish to explore specific topics in greater detail may consult the references cited within each chapter and listed in the Basic Texts section at the back of the book.

These references are intended to be selective rather than exhaustive, chosen by the BCSC faculty as being important, current, and readily available to residents and practitioners.

Videos

This edition of Section 13, *Refractive Surgery*, includes videos related to topics covered in the book. The videos were selected by members of the BCSC faculty and are available to readers of the print and electronic versions of Section 13. Mobile-device users can scan the QR code below (a QR-code reader must already be installed on the device) to access the video content.

Study Questions and CME Credit

Each volume of the BCSC is designed as an independent study activity for ophthalmology residents and practitioners. The learning objectives for this volume are given on page 1. The text, illustrations, and references provide the information necessary to achieve the objectives; the study questions allow readers to test their understanding of the material and their mastery of the objectives. Physicians who wish to claim CME credit for this educational activity may do so by following the instructions given at the end of the book.

Conclusion

The Basic and Clinical Science Course has expanded greatly over the years, with the addition of much new text, numerous illustrations, and video content. Recent editions have sought to place a greater emphasis on clinical applicability while maintaining a solid foundation in basic science. As with any educational program, it reflects the experience of its authors. As its faculties change and medicine progresses, new viewpoints emerge on controversial subjects and techniques. Not all alternate approaches can be included in this series; as with any educational endeavor, the learner should seek additional sources, including Academy Preferred Practice Pattern Guidelines.

The BCSC faculty and staff continually strive to improve the educational usefulness of the course; you, the reader, can contribute to this ongoing process. If you have any suggestions or questions about the series, please do not hesitate to contact the faculty or the editors.

The authors, editors, and reviewers hope that your study of the BCSC will be of lasting value and that each Section will serve as a practical resource for quality patient care.

Objectives

Upon completion of BCSC Section 13, *Refractive Surgery*, the reader should be able to

- state the contributions of the cornea's shape and tissue layers to the optics of the eye and how these components are affected biomechanically by different types of keratorefractive procedures
- describe the basic concepts of wavefront analysis and its relationship to different types of optical aberrations
- identify the general types of lasers used in refractive surgeries
- explain the steps—including medical and social history, ocular examination, and ancillary testing—in evaluating whether a patient is an appropriate candidate for refractive surgery
- for incisional keratorefractive surgery (radial keratotomy, transverse keratotomy, arcuate keratotomy, and limbal relaxing incisions), describe the history, patient selection, surgical techniques, outcomes, and complications
- list the various types of corneal onlays and inlays that have been used for refractive correction
- for surface ablation procedures, describe patient selection, epithelial removal, refractive outcomes, and complications
- describe patient selection, surgical techniques, outcomes, and complications for laser in situ keratomileusis (LASIK)
- describe the different methods for creating a LASIK flap using a microkeratome or a femtosecond laser as well as the instrumentation and possible complications associated with each
- explain recent developments in the application of wavefront technology to surface ablation and LASIK

- for conductive keratoplasty, state a brief overview of history, patient selection, and safety issues
 - describe how intraocular surgical procedures, including refractive lens exchange with intraocular lens (IOL) implantation or phakic IOL implantation, can be used in refractive correction, with or without corneal intervention
 - describe the different types of IOLs used for refractive correction
 - explain the leading theories of accommodation and how they relate to potential treatment of presbyopia
 - describe nonaccommodative and accommodative approaches to the treatment of presbyopia
 - state considerations for, and possible contraindications to, refractive surgery in patients with preexisting ocular and/or systemic disease
 - list some of the effects of prior refractive procedures on later IOL calculations, contact lens wear, and ocular surgery
-