

Simulation of toric intraocular lens results: Manual keratometry versus dual-zone automated keratometry from an integrated biometer

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PURPOSE: To evaluate simulated clinical outcomes in patients with toric intraocular lenses (IOLs) calculated on the basis of dual-zone automated keratometry from an integrated optical biometer, relative to manual keratometry.

SETTING: Private practice, Mesa, Arizona, USA.

DESIGN: Comparative case series.

METHODS: Patient records at 4 clinical sites were reviewed to identify patients who had manual keratometry and biometry with the Lenstar LS 900 recorded before toric IOL implantation and refractive follow-up data after implantation. Preoperative and operative data were extracted from patient charts. Simulated refractive outcomes were calculated based on mathematically removing the actual IOL implanted and then mathematically inserting the IOLs as determined by manual or automated keratometry from the biometer device.

RESULTS: Data for 128 patients were available for analysis. The actual residual astigmatism was comparable between manual keratometry and automated keratometry from the biometer system. Although simulated residual refractive astigmatism was similar between the 2 devices on average, there was variability in results by patient. Simulated residual refractive astigmatism was lower for the biometer when the standard deviation of the angle of astigmatism was low. Site-to-site variability was lower with the biometer than with manual keratometry.

CONCLUSIONS: Simulated outcomes suggest that overall results for a group of patients whose toric IOL surgery planning is performed with the dual-zone automated keratometry data from the biometer will be equivalent to those when manual keratometry is used. The reduced site-to-site variability with the biometer suggests an operational advantage.

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For several years, it has been possible to use toric intraocular lenses (IOLs) to correct existing corneal astigmatism at the time of cataract surgery. Use of a toric IOL was first reported by Shimizu et al. in 1994.¹ The successful use of a toric IOL involves measuring the existing anterior corneal astigmatism, accounting for any astigmatism induced by the surgical incision, and implanting the toric IOL at the appropriate angle to compensate for the combined preoperative and surgically induced astigmatism (SLA). Rotational stability is also important.

There are numerous methods to measure corneal astigmatism. In the case of the Acrysof toric IOL, the

original study conducted for the U.S. Food and Drug Administration approval relied on manual keratometry to determine the corneal astigmatism. As such, manual keratometry has been advocated as a preferred methodology for corneal astigmatism measurement.²

Early research comparing manual keratometry and automated keratometry suggested that manual keratometry was the gold standard.³ Later studies indicated that manual and automated keratometry produce comparable results, although with less variability in the automated results.⁴ This change is likely related to improvements in the technology of automated keratometers. In the area of cataract surgery,

Manual Vs Automated Keratometry

Victor M. Corman



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Mastering Refractive IOLs David F. Chang, 2008 The IOL technical specifications the clinical data and the necessary clinical and surgical skills comprise the scientific foundation for achieving a premium refractive outcome To consistently achieve patient satisfaction however requires mastering the art of patient and IOL selection communicating and counseling effectively and providing a premium patient experience This is a nontraditional book in which multiple experts are separately asked to discuss controversial subjects in a reader friendly format There is balanced coverage of all of the available refractive IOLs as well as those that may become available in the near future A major emphasis is placed on avoiding and managing complications or potentially dissatisfied patients There are more than 200 chapters that are organized into 14 major sections over 300 images 100 tables and 12 sidebars that cover every aspect of refractive IOL clinical practice This is a comprehensive educational resource addressing the most demanding and rapidly evolving area in cataract and refractive surgery today and the first book to cover both the clinical and nonclinical aspects of offering refractive IOL services **IOL Power** Kenneth Hoffer, 2024-06-01 IOL Power by Kenneth J Hoffer MD will be the definitive resource worldwide for ophthalmologists who strive to increase the accuracy for all IOL calculations especially for multifocal IOLs and overcoming the challenges that arise when treating patients that have had laser refractive surgery such as RK PRK LASIK and LASEK Inside the pages of IOL Power Dr Hoffer is joined by some of the most respected international physicians and physicists in the field of IOL power such as Aramberri Haigis Norrby Olsen and Shammas Together their expertise spanning over 35 years makes even the most difficult subjects easy to understand This volume will become the definitive reference source on the subject of IOL power calculation Some topics include Ultrasound velocities for axial length measurement Optical AL IOLMaster and Lenstar in difficult eyes Manual and automatic keratometry and instrumentation Topography Scheimpflug camera corneal power Value of theoretic formulas Formula personalization Multifocal and toric IOLs Aspheric IOLs Effect of IOL tilt on astigmatism Chapters Cover All aspects of obtaining the most accurate biometry Available modern calculation formulas Latest instruments Problems that can arise how to prevent and repair them IOL Power by Kenneth J Hoffer MD is structured in a logical manner so as to cover every facet of IOL power from the basics to the most complicated subjects to achieve the most accurate and precise calculations and should be in the hands of all ophthalmic surgeons technicians residents and students **Moorfields Manual of Ophthalmology** Timothy L Jackson, 2019-11-30 This third edition expands on the success of the best selling second edition to create the most practical and accessible ophthalmology manual for trainees With its succinct practical text profusion of clinical photos and descriptions of procedures the Moorfields Manual of Ophthalmology has established itself as one of the most popular and recognisable clinical resources available to ophthalmologists and optometrists Trainee reviewers provided feedback on the second edition that guided improvements to the third edition DESIGN Colour coded chapter tabs to improve navigation Descriptions of common procedures appear in

discrete boxes making them more prominent and accessible STRUCTURE New Triage chapter provides 15 algorithms based on common signs and symptoms and refers readers to the relevant sections on management CONTENT All content updated in line with current best practice Key Studies sections summarising landmark trials and their relevance to clinical practice Additional and replacement photos showing better clearer examples of clinical signs Additional colour diagrams depicting anatomic structures and procedures Selective inclusion of less common diseases and treatments *LASIK (Laser in Situ Keratomileusis)* Dimitri T. Azar, Douglas Koch, 2002-11-26 LASIK is a timely and authoritative source for refractive corneal and cataract surgeons ophthalmologists optometrists ophthalmic surgeons and upper level undergraduate graduate and medical students in these disciplines This guide emphasizes the latest tools and step by step procedures to increase the safety predictability and long term s **Cataract Surgery: Maximizing Outcomes Through Research** Hiroko Bissen-Miyajima, Douglas Donald Koch, Mitchell Patrick Weikert, 2014-09-22 Cataract Surgery Maximizing Outcomes Through Research provides cataract surgeons with helpful information about cataract operations based on the latest fundamental and clinical research This book comprehensively covers a wide range of topics from the basic principles of each treatment to today s hot topics such as femtosecond laser application cataract surgery and new intraocular lenses IOLs with accommodating or light adjustable function Detailed cutting edge discussion is provided in each chapter with the addition of diagrams photographs and tables to help readers better understand the subject Authored by leading international experts the book covers topics from preoperative evaluations to postoperative care including evaluation of accommodation and pseudo accommodation glistening and visual function the eye s image quality with a premium IOL IOL power calculations pupil size and postoperative visual function posterior capsular opacity corneal astigmatism femtosecond laser techniques and more Cataract Surgery Maximizing Outcomes Through Research is the perfect book for cataract surgeons and general ophthalmologists who wish to update their knowledge and make use of it in their everyday medical practice

Keratoconus Ashraf Armia, Cosimo Mazzotta, 2021-11-20 This book provides a practical guide to the most recent advances in the diagnostic management of corneal ectasia Clear concise chapters address new standardized nomograms of treatment of early progressive ectasia new epithelium on future crosslinking with and without oxygen supplement customized protocols laser assisted corneal regularization protocols and the new femtolaser assisted lamellar corneal transplant Clinicians and surgeons seeking a go to guide on the topic of corneal ectasia will find this book to be an essential resource for the latest developments and predicted future trends in the field Ophthalmology Myron Yanoff, Jay S. Duker, 2009-01-01 Based on feedback the authors have streamlined their bestselling reference to zero in on just the clinical answers ophthalmologists need in day to day practice This new edition presents unparalleled guidance on nearly every ophthalmic condition and procedure Refractive Lens Surgery Howard Fine I, Mark Packer, Richard Hoffman, 2005-07-07 Compiles the best cutting edge practices for achieving success with refractive lens exchange Features the latest micro

incision lens extraction techniques Well known group of authors with Fine and Packer being especially famous in the US Serves as textbook and reference guide for Ophthalmologists Clearly structured and richly illustrated Refractive Cataract Surgery John Hovanesian,2024-06-01 Updated and expanded this Second Edition of Refractive Cataract Surgery Best Practices and Advanced Technology is a practical guide for cataract surgeons and general ophthalmologists who wish to take their practices to a new level by offering refractive solutions to their cataract patients All chapters have been updated to provide the latest information on premium surgery including how to chapters on extended depth of focus implants intraoperative aberrometry and femtosecond laser surgery Both well established and cutting edge implants and techniques are presented in chapters that are organized by topic and detailed step by step Dr John A Hovanesian and his contributors include enhancement strategies such as piggyback lenses laser enhancement and incisional surgery which are presented as separate and complete solutions In addition to surgical strategies Refractive Cataract Surgery Second Edition explains the psychology of creating a premium practice Non technical matters such as patient screening ethics communicating the value of lenses and managing the unhappy patient are thoroughly presented with easy to adopt ideas New in the Second Edition Intraoperative aberrometry Femtosecond laser cataract surgery Diagnostic and management tools for ocular surface disease Extended depth of focus implants Updated information on Tecnis toric Trulign and other accommodating IOLs Advice on various pricing models Refractive Cataract Surgery Best Practices and Advanced Technology Second Edition explores every angle of premium surgery and practice and offers improvements for all levels of surgeons from the resident to the experienced physician resulting in a top experience and a lifetime of premium vision for the patient Surgical Correction of Astigmatism Jean-Luc Febbraro,Hamza N. Khan,Douglas D. Koch,2017-11-24 This book reviews the surgical techniques currently employed for the management of astigmatism with the aim of providing a clear comprehensive step by step guide that will help practitioners to optimize outcomes The book is divided into two sections covering the cutting edge surgical approaches in cataract and refractive patients Renowned experts with many years of clinical experience describe options such as incisional techniques toric intraocular lenses femtosecond and excimer laser technology In addition guidance is offered on preoperative evaluation of astigmatism candidate identification and classification and surgical management following penetrating keratoplasty Supplementary videos of informative sample cases are included to further aid everyday practice *Pathologic Myopia* Richard F. Spaide,Kyoko Ohno-Matsui,Lawrence A. Yannuzzi,2013-12-04 Pathological Myopia is a major cause of severe vision loss worldwide The mechanisms for vision loss include cataract glaucoma retinal detachment and above all degeneration of the macula within the posterior staphyloma Pathological Myopia is one of the only current books to specifically address this disease and discusses recent developments in imaging technologies and various approaches to treatments such as laser photocoagulation photodynamic therapy pharmacologic therapeutic injections in the vitreous and surgery Complete with high quality color images this book is written and edited by leaders in the field and is

geared towards ophthalmologists including residents and fellows in training glaucoma and cataract specialists and vitreoretinal macula experts **Cataract Surgery from Routine to Complex** Randall Olson, George Jin, Ike Ahmed, Alan Crandall, 2024-06-01 *Cataract Surgery from Routine to Complex* A Practical Guide provides eye care professionals guidance on what to do and how to avoid potential complications in all aspects of cataract surgery just as if the world's experts were by your side Drs Randy Olson George Jin Ike Ahmed Alan Crandall Robert Cionni and Jason Jones concisely provide a wealth of information including a detailed list of key issues and considerations for virtually all the possible contingencies of the procedure Some Topics and Sections Include Examination Pupil size ocular dominance biometry and more IOL Choice Monofocal aspheric vs traditional presbyopia correcting multifocal vs accommodating toric and more Routine Cataract Surgery Microincision cataract surgery OVD selection current phacoemulsification techniques and more Complex Cataract Surgery Hypermature cataract small pupil pseudoexfoliation nanophthalmos pediatric cataract and more Intra Operative Complications Wound burn posterior capsular rupture shallow anterior chamber and more Patient Assessment Visual acuity refraction visual quality and more Postoperative Complications Endophthalmitis toxic anterior segment syndrome IOL dislocation and more *Cataract Surgery from Routine to Complex* also includes a companion website that provides more than 2 hours of learning with 38 edited and narrated video presentations perfectly complementing the procedures discussed inside the text *Cataract Surgery from Routine to Complex* is the combination of a practical guide with broad academic underpinnings along with current controversial subjects on cataract surgery making it ideal for eye care professionals who wish to update their knowledge and translate it into improved surgical techniques and better cataract patient education

Essentials of Ophthalmology Samar K Basak, 2019-06-30 The seventh edition of this manual has been fully revised to provide trainees in ophthalmology with the latest advances in their field Divided into 28 chapters the book begins with discussion on ocular embryology and anatomy physiology neurology pharmacology refraction and history taking and physical examination Each of the following chapters is dedicated to the diagnosis and management of disorders and diseases in different parts of the eye lens uvea retina optic nerve vitreous and more The book concludes with sections on ocular injuries blindness common surgeries and surgical instruments The comprehensive text is further enhanced by nearly 1200 ocular images figures and tables Key points Comprehensive guide to diagnosis and management of ocular diseases and disorders for trainees Fully revised seventh edition providing latest advances in the field Highly illustrated with nearly 1200 images figures and tables Previous edition 9789352501601 published in 2015 *Optics for the New Millennium* Kamran M. Riaz, G. Vike Vicente, Daniel Wee, 2022-08-25 This textbook serves as a comprehensive manual on Optics that includes both didactics and assessment questions in an easy to read format It provides an educational and entertaining resource that reinforces the relevance of the subject matter to modern clinical and surgical ophthalmology practice The book offers a one stop compendium for students studying for certification exams and for practicing ophthalmologists to review and learn Optics that

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Cataract Surgery in the Glaucoma Patient Sandra M. Johnson, 2025-02-06 Managing cataracts to the best advantage of the glaucoma should result in the best long term visual outcomes for patients Cataract surgery is one of the most frequently performed procedures in the United States Notably cataracts are a leading cause of visual impairment in the world and glaucoma is a leading cause of irreversible blindness The coexistence of these two diseases is not uncommon and management of the cataract in the context of glaucoma can have significant impact on the glaucoma status of a patient and preserve vision This second edition book focuses on the treatment of cataract in the setting of glaucoma using an evidence based medicine approach This new edition includes updates to all chapters from the previous edition plus new chapters on combined cataract and express surgery and non penetrating deep sclerectomy as well as expanded chapters on new minimally invasive approaches to managing glaucoma along with cataract Cataract Surgery in the Glaucoma Patient is a valuable resource for general ophthalmologists and residents as well as glaucoma fellows

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Essentials of Cataract Surgery Bonnie Henderson, 2024-06-01 The straightforward concise and easy to read reference manual which is equivalent to having the best instructor offering guidance on what to do next and how to avoid potential complications is now available in an updated Second Edition **Essentials of Cataract Surgery Second Edition** comprehensively details every step of phacoemulsification cataract extraction surgery from preoperative evaluation to intraoperative instruction to postoperative care The basic elements of cataract surgery are presented in a clear and easy to read format Dr Bonnie An Henderson brings together advice and teaching techniques from the Harvard Intensive Cataract Surgical Training Conference at the Massachusetts Eye and Ear Infirmary The book provides both beginning and practicing surgeons with personal tips and expert advice from leading cataract mentors of top US ophthalmology residency programs Inside **Essentials of Cataract Surgery Second Edition** are detailed chapters covering fluidics IOL calculations and design capsular complications and management and the latest phaco technology including femtosecond cataract surgery Each chapter contains a summary box highlighting the key points of each topic discussed Additionally the included images diagrams photographs and tables enhance understanding of specific topics With detailed information and expert pearls in a user friendly format **Essentials of Cataract Surgery Second Edition** is perfect for residents fellows medical students and practicing ophthalmologists looking to improve their surgical techniques

Ophthalmology Bruce James, Larry Benjamin, 2007 Clear concise and clinical this unique reference offers a comprehensive overview of the basic techniques needed for ocular examination and diagnosis Abundantly illustrated it presents the principles of each technique provides guidance on choosing the appropriate approach explains how to perform them offers examples of when each technique should be used and lists their common indications and potential pitfalls Offers a full chapter covering new imaging techniques for the retina and optic nerve Features abundantly illustrated guidance in a clear format for a quick visual reference Explores standard assessment procedures as well as microbiological examination and investigation ultrasound and radiological evaluation clinical visual electrophysiology and fluorescein angiography

Evidence-based Approach in Cataract Surgery Jay Bhopi, 2004-10-14 It is absolutely necessary that the practising ophthalmologist bases clinical and surgical decisions on valid data rather than simply on intuition hearsay or peer practice although this is not to denigrate either one's own opinion or those of colleagues Evidence based medicine helps to improve clinical or surgical practice by

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