

Pediatric Cataract Surgery and IOL Implantation

A Case-Based Guide
Courtney L. Kraus
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ISBN 978-3-030-38937-6 e-ISBN 978-3-030-38938-3

<https://doi.org/10.1007/978-3-030-38938-3>

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This Springer imprint is published by the registered company Springer Nature Switzerland AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Foreword

Cataracts in children are common enough so that every pediatric ophthalmologist sees them and yet they are rare enough to create anxiety for the clinician who is trying to stay up on all of the latest evidence-based trends. Properly timed and expertly performed cataract surgery can bring sight to a child who would otherwise be blind. When the number of blind-years prevented is taken into account, pediatric cataract surgery may be the most cost-effective procedure in all of ophthalmology. However, unlike cataract surgery in an elderly adult, lens replacement in childhood removes youthful accommodation and derails emmetropization by removing the eye's natural offset to axial growth of the globe. As we commonly say: "Kids are not just small adults."

In this important book, Dr. Courtney Kraus has assembled an impressive group of experts and has chosen a case-based approach as an efficient and effective way to transfer knowledge. It should be on the required reading list of every pediatric ophthalmology fellowship program and every clinician who operates on children.

In Part I: Approach to Lens Opacities, the readers will be able to refresh their knowledge about how to think simultaneously like a developmentalist, a geneticist, and a surgeon. Cataracts can appear at any age and in an endless variety of forms. For some visually insignificant opacities, surgery is not recommended but change is always possible as the child grows. Illustrative cases are used to guide our recognition of random unilateral developmental missteps, familial bilateral progressive opacities, and cataracts secondary to systemic diseases and disorders. Pattern recognition is emphasized and a directed specific workup is preferred over a "shotgun" approach.

In Part II: Surgery, the readers will enjoy the practical step-by-step guidance that is provided for the surgical procedure, the implant power decisions, and the care of the child's eye during healing. Surgeons who operate on children and adults will be able to fully understand the stark differences between the needed steps in children compared to what is commonly done in adults. In Part III: Correcting Surgically-Induced Aphakia, 15 chapters are presented to guide surgeons through complex settings and associations. These chapters describe the pros and cons of the many options we have when faced with a decision about what is best for an individual child or an unusual situation.

I congratulate Dr. Kraus for assembling this guide that so successfully presents a complex topic in a format that is so easy to read and understand. The children are the future and the future for children with cataracts is brighter when we are all informed and when we adopt new innovations while still remaining cautious and careful. In short, we treat our patients the way we would want our own children to be treated.

M. Edward Wilson

Preface

The presence of a lens opacification in childhood requires special considerations and nuanced care. For those ophthalmic surgeons working to identify and treat pediatric cataracts, surgical technique has progressed dramatically over the last decade with advancements in surgical tools and diagnostic devices. Through this text, the latest technology in lens implantation will be presented, but it remains screening, prompt identification, and consistent follow-up and amblyopia management that are the real determinants of visual acuity outcomes.

The goal of this textbook is to give the reader an overview of pediatric cataract surgery, with a focus on the use of intraocular lenses. By using the format of a case-based guide, it is hoped that the reader will consult each chapter as those unique and complex patients present themselves. Furthermore, for those still in training or looking to complement their education, the systematic progression through case scenarios will ideally form a strong curriculum with which to supplement those cases encountered in clinic and the operating room.

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Acknowledgments

This book represents the culmination of the collective efforts of 47 authors, some at the very beginning of their careers in ophthalmology and others with decades of experience. They span a multitude of institutions, academic and private practice, four countries, and three continents. I consider many dear friends and all remarkable authorities on the topics presented. To each individual, who took time out of a busy practice or training experience, time away from family and friends, and instead focused on authoring a carefully researched and thoughtfully presented chapter, I am tremendously grateful. Because of the great variety in backgrounds, quality of content, and clarity in the provided expertise, I truly believe this book can sit alongside many of the great texts in pediatric ophthalmology. It will hopefully offer trainee and established surgeon pearls, tips, and additional insight.

As I now have the privileged position to provide advice and guidance to my own trainees, I think my most oft-repeated advice when asked about fellowship is to seek out your mentor. Surgical fellowship is one of the last true apprenticeships, where master craftsman imparts upon novice the subtleties and wisdom that sets his/her practice apart from the next. In doing so, friendship and respect form, and for many, a lasting bond. It has been a great privilege to call Dr. M. Edward Wilson my mentor. In my time in fellowship, and through continued advice and guidance in the years that have followed, I have truly benefited from his knowledge, skill, mastery, care, and respect. For this I am tremendously grateful. I must also extend my thanks to the others that mentored me in my career in pediatric ophthalmology: Drs. Michael Repka, David Guyton, Edward Cheeseman, Richard Saunders, M. Millicent Peterseim, Lawrence Tychsen, Gregg Lueder, and especially Susan Culican.

I would also like to specifically thank Drs. Brita Rook and Jennifer Davidson. Co-fellows are often very special partners in crime while in training, but these two have become two of my greatest friends, and trusted advisors, in all things eye- and non-eye-related. There are too many friends along my career, be it in undergraduate, medical school, residency, fellowship, or beyond to call out by name. But to each, I promise to find and share a hug of appreciation and celebration the next time we see each other at a meeting.

And finally, to the people without whom I could never be in the fortunate position I am today – my family. To my newest family, the Desais, may we all be so fortunate to have in-laws as caring and full of love as you. You celebrated my work on this book and its completion. To my parents – where to begin – I really cannot imagine two more supportive people. Your love, understanding, and unconditional support started from the beginning and never wavered. Mom, you reviewed every paper I wrote for years, and for that, I spared you having to proofread these 25 chapters. And Dad, your hard work and attention to detail are attributes I am still trying to master, but I called on both many a time as this project neared completion. And to my brother Alex, thanks for keeping me in the loop on Duke basketball scores when time would not allow me to catch games in full.

To my person, my husband, Shaun Desai, thank you for being you. You are my biggest cheerleader and best friend. You know more about pediatric cataracts than some who may consider reading this book. And this is because you know to love me means to love what I love. You never questioned that this project was within my reach and pushed and supported me right to the end. Thank you for walking me outside of my comfort zone and holding my hand the entire way.

Finally, the preliminary discussions outlining this book first came about when my daughter was 10 weeks old. She is now 19 months. To Isla, your first year and half of life was delightful, joyful, funny, and all too quick. I will treasure this book as the other creation that grew to life over the course of the last year.

Thank you everyone.

Courtney L. Kraus

Overview of Structure

This book is divided into four parts.

- *Part I: Approach to Lens Opacities* provides an overview of lens opacities in childhood, providing a framework for evaluation, nonsurgical management, and preoperative planning. Here, the basics differentiating unilateral from bilateral cataracts, as well as epidemiology and genetics, are reviewed. Preoperative examination and counseling is reviewed.
- *Part II: Surgery* gives the reader an overview of surgical steps, IOL calculations, and postoperative considerations. Case-based presentations assist in illustrating surgical techniques and IOL selection.
- *Part III: Correcting Surgically Induced Aphakia* remains critical for visual rehabilitation following cataract surgery. Options include aphakic glasses, contact lenses, and intraocular lens implantation. The later chapters in this section present unique approaches and in-depth discussion of IOL implantation. Less common lens selections, such as multifocal and accommodative IOLs, and techniques, such as poly-pseudophakia and IOL exchange, are presented.
- *Part IV: Special Considerations in IOL Implantation* concludes the textbook. Within this section, seven situations requiring careful preoperative planning, innovative surgical technique, and special postoperative care are reviewed. Standing alone, this section provides a quick consultation for challenging cases.

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