

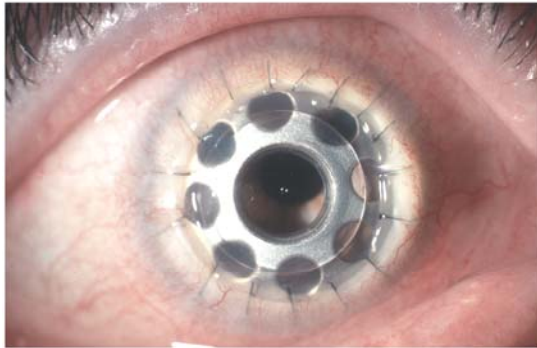


## *Boston Keratoprosthesis Update*

Newsletter V: 2008

Editor: Larisa Gelfand, COT, MAEd

<http://www.meei.harvard.edu/shared/ophtho/cornea2.php>



Titanium back plate.  
Is it more tissue friendly?  
Probably, but not fully tested yet.  
Can be a cosmetic problem.

### ***SAFETY FIRST ...***

Do we need prophylaxis against fungal infections?

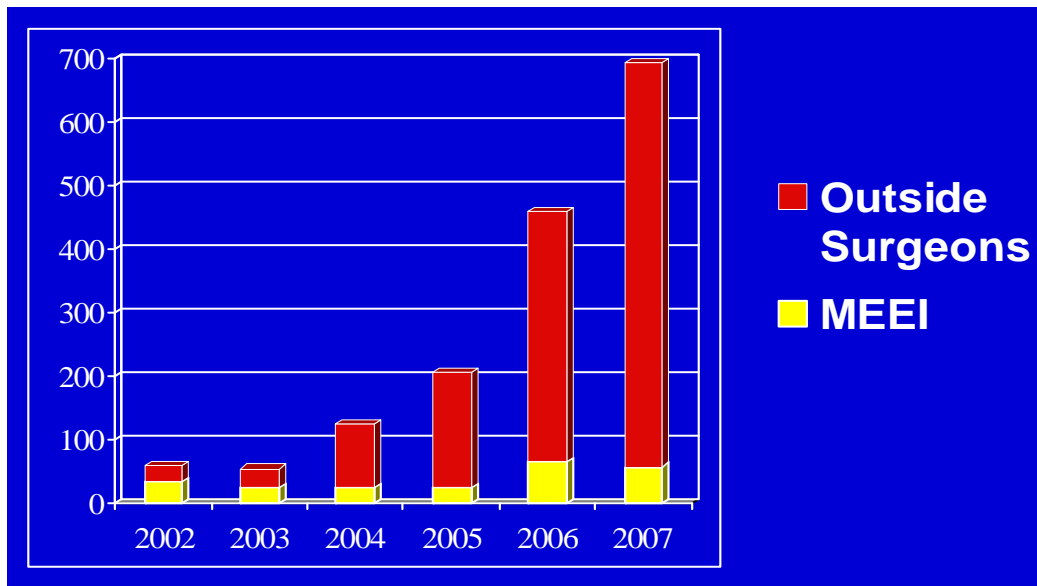
Prophylactic drops of antibiotics have worked remarkably well in preventing bacterial endophthalmitis in KPro eyes. Vancomycin drops (14 mg/ml plus 0.005% BAK), together with a fourth generation fluoroquinolone, are recommended once daily in our post KPro patients. In autoimmune diseases (SJS, OCP), we recommend a twice daily regimen. In Boston, no acute bacterial endophthalmitis has occurred during 9 years of use of Vancomycin, not even in the vulnerable autoimmune diseases. The vancomycin will have to be compounded but it is stable at room temperature for at least 2 months. In countries outside the US, there may be reasons for substituting the fluoroquinolone for Polytrim or chloramphenicol.

Fungal infections are rare in the US Northeast and we do not give antifungals routinely as prophylaxis. In other parts of the world, however, fungal keratitis is frequent and fungal infections around KPros have been reported to us. After reviewing prevalence and types of fungal infections in various parts of the world, we would like to recommend short "bursts" of antifungal prophylaxis for such areas that are particularly susceptible. Thus Natamycin 5% suspension can be given twice daily for a week, every 2-3 months. Amphotericin B 0.15% is less stable and must be compounded. The efficacy of this addition is still unknown but it ought to be helpful in more fungal susceptible areas.

Thus, with such prophylactic regimens as described above, and if complied to, infections around the KPro should be very rare. To protect the inevitable noncompliant patient, often far-away from physician, pharmacy and other support services, the junction between corneal stroma and plastic must be made as tight and resistant to microbial invasion as possible. Work toward that such goal is progressing in our laboratories but it is unlikely to give fast results. In the meantime we have to impress on our patients the need for disciplined lifelong use of prophylactic drops. **Safety first!**

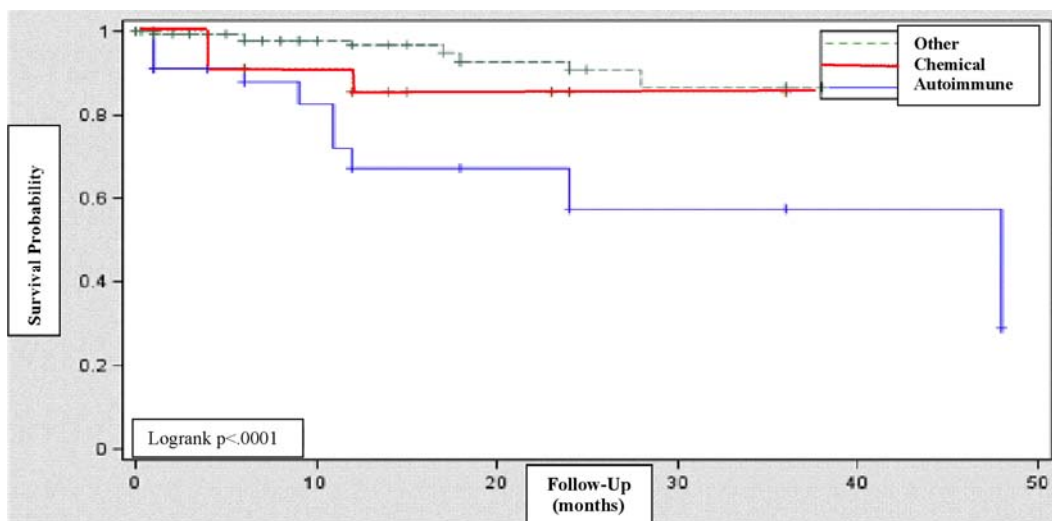
- Claes Dohlman, MD, PhD    Irmgard Behlau, MD

## Over 2000 Boston KPros Implanted...



Demand for the device continues to increase.

## Update on the Multi-Institutional Retention Study: Boston KPro Survival (252 Total)



Data from 21 centers compiled by the Multicenter KPro Study Group led by Drs. Belin, Ciolino, Zerbe, Ament and Todani (ARVO poster 2008, with permission). 43 eyes had diagnosis of autoimmune disease (SJS, OCP, etc.). 28 eyes were chemical burns, and the majority, 181 eyes were “others” with adequate tear and blink function. The vast majority had previous standard graft failure. KPro is not recommended in autoimmune diseases.

## ***Boston Keratoprosthesis in Ethiopia***

The WHO estimates that over 8 million people are bilaterally blind due to corneal disease, 5 million related to trachoma alone. Most of these people live in developing nations.



*Roberto Pineda, MD, Attending in the Cornea Service, MEEI and Jared Ament, MD, Research Fellow, with Boston KPro patient during their Ethiopian mission.*

The purpose of this mission was to determine whether the Boston KPro is a sustainable ophthalmic procedure even in countries with very limited health resources.

Careful patient selection, standardized protocol implementation, and meticulous post-operative follow-up and surveillance are necessary for long-term evaluation.

The project is expected to be continued for many years.

## ***Boston Keratoprosthesis in the care of children***



*Dr. Kathryn Colby with 4-year-old Nathan Lewis and his parents.*

Nathan was born on the small Caribbean island of Barbados with Peter's Anomaly.

Dr. Colby implanted a Boston KPro in March 2008.

After the operation, Nathan began to walk on his own for the first time. The entire team was thrilled with Nathan's progress.

"This is truly a major advance in the care of children with corneal disease such as Peter's Anomaly," said Dr. Colby.

*Profile of a KPro surgeon:*

**Sadeer B. Hannush, M.D.**



Sadeer B. Hannush, M.D. is Attending Surgeon on the Cornea Service at Wills Eye Institute and Assistant Professor of Ophthalmology at the Jefferson Medical College in Philadelphia. He earned his Doctor of Medicine degree from Wayne State University in Detroit, Michigan, and completed his Ophthalmology Residency at George Washington University in Washington, D.C. He then went on to fellowship training in Corneal and Refractive Surgery at Emory University in Atlanta, Georgia.

Dr. Hannush's areas of interest are full and partial thickness corneal transplantation (endothelial replacement), complex cataract and anterior segment reconstructive procedures, including permanent keratoprosthesis surgery and laser vision correction. He lectures nationally and internationally on these topics. He has multiple publications in the peer-reviewed literature and chapters in ophthalmology texts.

For the past seventeen years, Dr. Hannush has been chosen to teach at the American Academy of Ophthalmology's Annual Meetings on the subjects of corneal transplantation, keratoprosthesis surgery, intraocular lens management etc.

We are very grateful to Dr. Hannush for his continuing pioneering effort in the clinical testing of various types of Boston Keratoprosthesis over many years.

## *New KPro leader recruited to Boston...*

### *James Chodosh, M.D., M.P.H.*



Dr. Chodosh is a native of Elizabeth, New Jersey. He graduated from Hampshire College with a degree in filmmaking, but went on to pursue premedical studies at New York University prior to his medical education at Baylor College of Medicine.

He completed residency training in Ophthalmology at Baylor, clinical fellowship training in Corneal and External Diseases and Surgery at the Bascom Palmer Eye Institute, and a postdoctoral research fellowship in Virology & Molecular Biology and Infectious Diseases at St. Jude Children's Research Hospital in Memphis.

He was awarded his Masters of Public Health (Biostatistics) in 2007 from the University of Oklahoma College of Public Health.

Dr. Chodosh served as Assistant Professor of Ophthalmology at the University of Tennessee College of Medicine from 1993 to 1995, and worked

at the Dean A. McGee Eye Institute, University of Oklahoma College of Medicine for the next 13 years, where he was appointed Professor of Ophthalmology, and Adjunct Professor in the Departments of Cell Biology and Microbiology & Immunology in 2005. He held the M.G. McCool Chair in Ophthalmology, and was Residency Program Director for the Department of Ophthalmology, and Fellowship Director and Chief of Cornea & External Diseases. He was Vice-Chief of the Ophthalmology Clinical Service at OU Medical Center, and Full Member of the Graduate Faculty.

Dr. Chodosh's primary clinical and research interests include medical and surgical treatment of infectious and neoplastic disorders of the ocular surface, and the visual restoration of "hopeless" cases. He has been funded by the National Eye Institute for his research on ocular adenovirus infection for over 14 years consecutively. He is a founding member of the Molecular Pathogenesis of Eye Infection Research Center, and organizer of the Public Health Working Group in Ophthalmology.

He is an Editorial Board Member of the American Journal of Ophthalmology, and performs peer review on a regular basis for 17 additional journals.

Dr. Chodosh has during the last few years taken a very strong interest in keratoprosthesis biology, and he is a very welcome addition to our group.

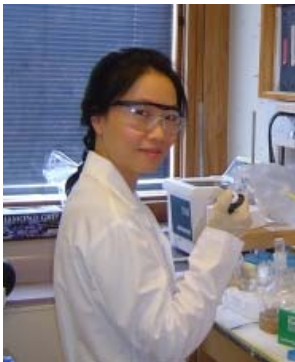
## Meet Other New Members of the Boston KPro Team:



Ilene Gipson, PhD  
Professor of Ophthalmology, HMS  
Senior Scientist  
Schepens Eye Research Institute



Liqiang Wang, M.D.,  
PhD Research Fellow  
Beijing, China



Hyeran Noh, PhD  
Research Fellow  
working in Drs. Langer's  
and Kohane's laboratory at MIT



Vandana Jain, M.D.  
Visiting surgeon  
Mumbai,  
India



Mary Lou Moar  
Consulting KPro Administrator  
A veteran from the development  
of the Boston KPro.



Suksri Chotikavanich, M.D.  
Visiting surgeon  
Bangkok, Thailand

## **Recent Boston KPro Literature – 2007 to present**

Barnes SD, Dohlman CH, Durand ML. Fungal colonization in the Boston Keratoprosthesis. *Cornea* 2007;26: 9-15

Waller S., Dohlman CH. The Boston keratoprosthesis. In: Brightbill, F. ed. *Corneal Surgery: Theory, Technique and Tissue*. 4th ed., Mosby, in press

Khan BF, Harissi –Dagher M, Dohlman CH. Keratoprosthesis. Albert DM, Miller JW, eds, Azar DT, Blodi BA, assoc. eds. In: Albert and Jakobiec's Principles and Practice in Ophthalmology, 3rd Edition. London: Elsevier, December 2007

Harissi-Dagher M, Khan BF, Dohlman CH. The Boston Keratoprosthesis. In: *Corneal transplantation*. Rasik B Vajpayee, ed, Namrata Sharma, Geoffrey C Tabin and Hugh R Taylor, co-editors. Vajaypee Brothers Medical Publishers. New Delhi, in press.

Harissi-Dagher M, Khan BF, Dohlman CH. The importance of nutrition to corneal grafts when used as a carrier of the Boston Keratoprosthesis. *Cornea* 2007;26:564-568

Khan BF, Harissi -Dagher M, Dohlman CH. Advances in Boston Keratoprosthesis: Enhancing Retention and Prevention of Infection and Inflammation. *Int Ophthalmol Clin* 2007; 47:61-71

Khan BF, Harissi-Dagher M, Langston DP, Aquavella J, Dohlman CH. The Boston Keratoprosthesis in Herpes Simplex Keratitis. *Arch Ophthalmol* 2007;125:745-749

Kocaturk T, Dohlman CH. Keratoprotez Cerrahisi. *Turkiye Klinikleri J Ophthalmol* 2007;16:47-55

Harissi-Dagher M, Colby KA. Cataract extraction after implantation of a Type I Boston keratoprosthesis. *Cornea* 2008; 27 : 220-222

Sayegh RR, Ang LPK, Foster CS, Dohlman CH. The Boston Keratoprosthesis in Stevens-Johnson Syndrome : An Update. *Am J Ophthalmol* 2008 ;145: 438-444

Akpek E, Harissi-Dagher M, Petrarca R, Butrus S, Pineda R, Aquavella J, Dohlman CH. Outcomes of Boston Keratoprosthesis in aniridia. A retrospective multicenter study. *Am J Ophthalmol* 2007;144 :227-231

Sa-ngiampornpanit T, Thiagalingam S, Dohlman CH. Boston Keratoprosthesis in epithelial downgrowth. Submitted to *DJO*

Pavan-Langston D, Dohlman CH. Boston Keratoprosthesis:treatment of herpes zoster neurotrophic keratopathy. *Ophthalmology* 2008;115:321-323

McLellan CL, Ngo V, Pasedia S, Dohlman CH. Long-term stability of vancomycin ophthalmic solution. *Int J Pharm*, 2008, Vol.#12; 456-459

Saad CG, Ayres BD, Cohen EJ. The Boston Keratoprosthesis in Patients with Autoimmune Polyendocrinopathy. Submitted to *Arch Ophthalmol*

Dohlman CH, Harissi-Dagher M, Graney J. The Boston Keratoprosthesis: A New Threadless Design. *DJO*, 2007, Vol.13 #3

Aquavella JV, Gearinger MD, Akpek EK, McCormick GJ. Pediatric keratoprosthesis. *Ophthalmology* 2007;114:989-994

Harissi-Dagher M, Beyer J, Dohlman CH. The role of soft contact lenses as an adjunct to the Boston Keratoprosthesis. *Int Ophthalmol Clin*, 2008, 48

Ciolino JB, Dohlman CH. Biological keratoprosthesis materials. *Int Ophthalmol Clin*, in press

Garcia JPS, delaCruz, J, Rosen RB, Buxton G. Imaging implanted keratoprosthesis with anterior-segment optical coherence tomography and ultrasound biomicroscopy. *Cornea* 2008; 27: 220-222

Aquavella JV. Keratoprosthesis revisited – Current status of keratoprosthesis surgery. *Contemporary Ophthalmology* 2008 7;1-8

Aquavella JV. Keratoprosthesis in the treatment of congenital cornea opacity. *Contemporary Ophthalmology* 2008 7;1-6

Harissi-Dagher, M, Dohlman CH. The Boston Keratoprosthesis in severe ocular trauma. *Can J Ophthalmol*. 2008, 42 :165-169

Rivier D, Paula JS, Kim E, Dohlman CH, Grosskreutz CL. Glaucoma and keratoprosthesis surgery : role of adjunctive cyclophotocoagulation. Submitted to *Glaucoma*

Durand ML, Dohlman, CH. Successful prevention of bacterial endophthalmitis in eyes with the Boston Keratoprosthesis. *Cornea*, in press.

John T : Artificial Cornea : Surgical use of Boston Keratoprosthesis. *Ann of Ophthalmol* 2008 ; 40 : 2-7.

Ament JD, Spurr-Michaud S, Dohlman CH, Gipson IK. The Boston Keratoprosthesis: Comparing corneal Cell compatibility with titanium and PMMA Backplates. Submitted to *Cornea*

Ciolino JB, Hoare TR, Iwata NG, Behlau I, Dohlman CH, Langer R, Kohane DS. A drug-eluting contact Lens. Submitted to *IOVS*

Dohlman CH, Grosskreutz CL, Chen TC, Pasquale LR, Rubin PAD, Kim EC, Durand M. Shunt to divert aqueous humor to distant epithelialized cavities after keratoprosthesis surgery. Risk of infection. Submitted to *Glaucoma*.



## Posters

AAO – 2007

Aquavella JV, Plotnik RD, Gearinger MD, Shareef SR, Hindman HB. Keratoprosthesis – Indications for Surgery. Poster #64

Shen TT, Dohlman CD. “Boston KPro for treating corneal blindness in the developing world.” International Society for Refractive Surgery. AAO Joint Meeting, Beijing, People’s Republic of China, May 2007

ASCRS – 2008

Airiani S, Wong S, Wolf EJ, Kleiman L. Endophthalmitis and Intraocular Abscess Following Boston Keratoprosthesis Type 1 Implant: Case Report with Clinicopathologic Correlation. Poster #114

Stasi, K, Pantanelli SM, Ramkumar S, Yoon G, McCormick GJ, Aquavella JV. Evaluation of Higher-Order Aberrations in Eyes with Dohlman/Boston Keratoprosthesis and Comparison with Penetrating Keratoplasty and Normal Eyes. Poster #178

ARVO – 2008

Sheth V, Blair M, De la Cruz J. Macular Optical Coherence Tomography Findings in Boston Type 1 Keratoprosthesis Patients at the Illinois Eye and Ear Infirmary. Poster #5707

Chew HF, Ayres BD, Hammersmith KM, Rapuano CJ, Laibson PR, Myers JS, Cohen EJ. Boston Keratoprosthesis Outcomes and Complications. Poster # 5708

Parikh M, Vajaranant T, De la Cruz J. Retinal Nerve-Fiber Layer OCT as an Adjunct to Glaucoma Monitoring After Boston Keratoprosthesis. Poster #5709

Gupta S, Garcia JP, Ritterband DC, De la Cruz J. Evaluation of Anterior Chamber Depth in Aphakia and Pseudophakic Patients with Boston Type 1 Keratoprosthesis. Poster #5711

Ciolino JB, Ament JW, Zerbe BL, Melin MW. Etiology of Keratoprosthesis Loss: Results from the Boston Keratoprosthesis Multicenter Study. Poster #5712

Ament JD, Spurr-Michaud S, Dohlman CH, Gipson IK. The Boston Keratoprosthesis: Comparing Corneal Cell Compatibility with Titanium and PMMA Backplates. Poster # 5713

Garcia JP, Ritterband DC, Ko A, Seedor JA, Buxton DF, De la Cruz J. Evaluation of the Stability of Boston Keratoprosthesis Type 1-Donor Cornea Interface Utilizing Anterior Segment Optical Coherence Tomography. Poster #5715

## ***Invitation to KPro events at 2008 AAO***

You are cordially invited to attend the “Boston KPro Users Breakfast” to be held during the AAO meeting, Monday, November 10<sup>th</sup>, 2008, 7:30 am – 9:00 am at the Embassy Suites Hotel at Centennial Park ,Legacy Room.

For further information contact mlmoar@verizon.net

There will be a KPro Course entitled: The Boston Keratoprosthesis: What You Don't Know Will Surprise You, on Monday, November 10<sup>th</sup> from 2:00 pm – 4:15 pm in Room B402. Dr. Anthony Aldave will be the moderator.

A breakfast roundtable chaired by Dr. Peter Zloty will take place on Tuesday, November 11<sup>th</sup> from 7:30 am – 8:30 am in Hall A1 (limited to 9 attendees).

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### ***Boston Keratoprosthesis E-Newsletter***

Please let us know if you would like to receive the email version of the newsletter or if your mailing address has changed. Email your contact information to [larisa\\_gelfand@meei.harvard.edu](mailto:larisa_gelfand@meei.harvard.edu) or send Larisa Gelfand via fax, 617-573-4369.

Name: \_\_\_\_\_

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