47th Annual Residents’ Days

June 17-18, 2011
Retter Educational Center
Bascom Palmer Eye Institute
Miami, Florida

Presented by
Bascom Palmer Eye Institute Alumni Association
Department of Ophthalmology
University of Miami Miller School of Medicine

Sponsored by the
University of Miami Miller School of Medicine
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XXXIII Inter-American Course in Clinical Ophthalmology  
Date: October 30- November 2, 2011  
Location: Intercontinental Hotel, Miami, FL  
Course Directors: Francisco Fantes, MD, Eduardo Alfonso, MD, Paul Palmberg, MD, PhD, and Victor Perez, MD  
CME Credits: N/A

Ophthalmic Imaging 2012: Optical Coherence Tomography (OCT) Applications and Future Technology  
Date: December 3, 2011  
Location: The Breakers Hotel, Palm Beach, FL  
Course Directors: Donald L. Budenz, MD, MPH and Carmen A. Puliafito, MD, MBA  
CME Credits: TBD

50th Anniversary of Bascom Palmer Eye Institute Scientific Meeting  
Date: February 2-4, 2012  
Course Director: Eduardo C. Alfonso, MD  
Location: BPEI Retter Educational Center & The Biltmore Hotel, Coral Gables, FL  
CME Credits: TBD

48th Annual Residents’ Days  
Date: June 15-16, 2012  
Location: Bascom Palmer Eye Institute, Retter Educational Center Miami, FL  
Course Director: Patrick Rubsamen, MD and George Corrent, MD  
CME Credits: TBD
47th Annual Residents’ Days
June 17-18, 2011
Bascom Palmer Eye Institute
Miami, Florida

ACCREDITATION
The University of Miami Leonard M. Miller School of Medicine is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing education for physicians.

CREDIT DESIGNATION
The University of Miami Leonard M. Miller School of Medicine designates this live activity for a maximum of 9.75 AMA PRA Category 1 Credits™. Physicians should only claim credit commensurate with the extent of their participation in the activity.

LEARNING OBJECTIVES
Upon completion of the course, participants will be able to:

• Compare indications and techniques for vitreoretinal surgical procedures

• Diagnose ocular infectious diseases through the use of microbiology

• Identify ocular neoplasms and other corneal conditions

• Determine appropriate use of intraocular injections

• Examine diagnostic capabilities of imaging for glaucoma and formulate treatment plans based on imaging data

DOCUMENTATION OF ATTENDANCE FOR CME
1. Complete Credit Adjustment Form.
2. Certificates of Attendance will be emailed to attendees approximately 4 to 6 weeks after the conference.

EVALUATIONS
Conference evaluations are a valuable tool in assisting to better serve you. Please remember to complete the evaluation forms and submit them at the registration desk. We welcome your comments and suggestions. An outcome evaluation will be conducted 2 to 3 months following the course to measure the impact this activity has had in changing performance and patient outcomes. We encourage and appreciate your participation.

ACKNOWLEDGEMENT
This CME activity is partially supported by:

Commercial Supporters:
Alcon Laboratories, Inc.
Allergan, Inc.
Genentech, Inc.
Synergetics, Inc.
The following speakers and planners have indicated that they do not have relevant financial interests with commercial interests:

- Ashkan M. Abbey, MD
- Mohamed F. Abou Shousha, MD
- Guillermo Amescua, MD
- Ahmad A. Aref, MD
- Susan E. Azar, MD
- Audina M. Berrocal, MD
- Kara M. Cauvuto, MD
- Jonathan S. Chang, MD
- Gabriel T. Chong, MD
- George F. Corrent, MD, PhD
- Derek W. DelMonte, MD
- Avnish A. Deobhakta, MD
- Daniel B. Driscoll, MD
- Andres Emanuelli, MD
- Jonathan Erickson, MD
- Jane Fishler, MD
- Jeffrey L. Goldberg, MD, PhD
- Roger A. Goldberg, MD, MBA
- Marco A. Gonzalez, MD
- Nishi Gulati, MD
- Luis J. Haddock, MD
- Christopher R. Henry, MD
- Samuel K. Houston, III, MD
- Maggie B. Hymowitz, MD
- Ryan F. Isom, MD
- David J. Jacobs, MD
- Hong Jiang, MD, PhD
- Thomas E. Johnson, MD
- Elma E. Kim, MD
- Andrea Kossler, MD
II. The following speakers and planners have indicated relevant financial relationships with the following commercial interests:

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All Conflicts of Interest have been resolved.
47th ANNUAL RESIDENTS’ DAYS
June 17-18, 2011

Course Co-Directors

George F. Corrent, MD, PhD
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University of Miami Miller School of Medicine
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Jeffrey L. Goldberg, MD, PhD
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Thomas E. Johnson, MD
Professor of Clinical Ophthalmology

Craig A. McKeown, MD
Professor of Clinical Ophthalmology

Amy C. Schefler, MD
Assistant Professor of Clinical Ophthalmology

Bascom Palmer Eye Institute Residents

FIRST YEAR
Ashkan M. Abbey, MD
Marco A. Gonzalez, MD
Christopher R. Henry, MD
Samuel K. Houston III, MD
Bradford W. Lee, MD
Benjamin J. Thomas, MD
Jonathan H. Tzu, MD
SECOND YEAR
Jonathan S. Chang, MD
Avnish A. Deobhakta, MD
Roger A. Goldberg, MD, MBA
Luis J. Haddock, MD
Aleksandra V. Rachitskaya, MD
Ruwan A. Silva, MD
Matthew J. Weiss, MD

THIRD YEAR
Kara M. Cavuoto, MD
Jane Fishler, MD
Ryan F. Isom, MD
Lejla Mutapcic, MD
David Wilkin Parke III, MD
David B. Samimi, MD
Justin H. Townsend, MD

CHIEF RESIDENTS
Lisa C. Olmos, MD, MBA
Charles C. Wykoff, MD, D.Phil

Bascom Palmer Eye Institute Fellows

Mohamed F. Abou Shousha, MD (Cornea)
Guillermo Amescua, MD (Cornea)
Ahmad A. Aref, MD (Glaucoma)
Susan E. Azar, MD (Pediatrics)
Gabriel T. Chong, MD (Glaucoma)
Derek W. DelMonte, MD (Cornea)
Daniel B. Driscoll, MD (Cornea)
Andres Emanuelli, MD (Retina)
Jonathan Erickson, MD (Glaucoma)
Nishi Gulati, MD (Medical Retina)
Maggie B. Hymowitz, MD (Glaucoma)
David J. Jacobs, MD (Retina)
Hong Jiang, MD, PhD (Neuro-ophthalmology)
Andrew A. Kao, MD (Pathology)
Elma E. Kim, MD (Glaucoma)
Andrea Kossler, MD (Oculoplastics)
Brandon W. Lee, MD (Medical Retina)
Rumya R. Rao, MD, MPH (Medical Retina)
Hady Saheb, MD, CM (Glaucoma)
Andrew M. Schimel, MD (Retina)
Milan Shah, MD (Medical Retina/Uveitis)
Thomas S. Shane, MD (Retina)
Anita R. Shirodkar, MD (Retina)
Natalie A. Stanciu, MD (Neuro-ophthalmology)
Kevin K. Suk, MD (Retina)
Anil S. Vedula, MD (Cornea)
Shalini Yalamanchi, MD (Uveitis)
Zohar Yehoshua, MD, MHA (Medical Retina)
Chad C. Zatezalo, MD (Oculoplastics)

**Neuro-Ophthalmology Session: Tribute to Drs. Joel S. Glaser and J. Lawton Smith Speakers**

*No CME credit offered for this session*

Robert B. Daroff, MD
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Case Western Reserve University School of Medicine
Cleveland, Ohio

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University of Miami Miller School of Medicine
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Adjunct Professor, Departments of Neurology and Neurosurgery
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Oklahoma City, Oklahoma

Lanning Kline, MD
Endowed Chair, EyeSight Foundation of Alabama
Professor and Chairman, Department of Ophthalmology
University of Alabama at Birmingham
Birmingham, Alabama

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Bascom Palmer Eye Institute
University of Miami Miller School of Medicine
Miami, Florida

Grant T. Liu, MD
Professor of Neurology, Hospital of the University of Pennsylvania
Professor of Ophthalmology, University of Pennsylvania School of Medicine
Philadelphia, Pennsylvania
Sreedhar Potarazu, MD, MBA
President, CEO
VitalSpring Technologies
McLean, Virginia

Norman J. Schatz, MD
Owner, Neuro-Ophthalmology Associates
Voluntary Professor of Ophthalmology
Bascom Palmer Eye Institute
University of Miami Miller School of Medicine
Miami, Florida

Robert L. Tomsak, MD, PhD
Professor, Departments of Ophthalmology and Neurology
Kresge Eye Institute, Wayne State University School of Medicine
Detroit, Michigan
Friday, June 17, 2011

7:30  Registration and Continental Breakfast

8:00  Introduction/Welcome
      Eduardo C. Alfonso, MD and Patrick E. Rubsamen, MD

Session I
Moderator: Audina M. Berrocal, MD

8:10  The Effect of Resistance Training on Microsurgical Tremor, Phase II, Pharmacologic Intervention
      Daniel B. Driscoll, MD

8:22  A Retrospective Analysis of Primary Tube Results
      Elma E. Kim, MD

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      Bradford W. Lee, MD

- 17 -
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Jane Fishler, MD

9:46  **Randomized Controlled Electron Microscopy Study of Infected Lacrimal Silicone Stent Biofilms**  
David B. Samimi, MD

9:58  **Break**

**Session II**  
Moderator: Amy C. Schefler, MD

10:20  **Epithelial Irregularity Factor (EIF): A Novel Technique for the Management of Dry Eye Syndrome**  
Mohamed F. Abou Shousha, MD

10:32  **Elimination of Post-Injection Topical Antibiotics After Intravitreal Injections**  
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D. Wilkin Parke, III, MD

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Justin H. Townsend, MD

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Moderator: Thomas E. Johnson, MD

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Chad C. Zatezalo, MD

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4:32  *Modern Diagnostic Techniques: Flow Cytometry and Gene Rearrangement in the Diagnosis of Intraocular Lymphoma*
Milan Shah, MD

4:44  *The Impact of Surgical Intraocular Pressure Reduction on Visual Function Using Various Criteria to Define Visual Field Progression*
Maggie B. Hymowitz, MD

4:56  **Adjourn**
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Gabriel T. Chong, MD

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Ryan F. Isom, MD

11:00  **A Novel SD-OCT Algorithm for Measuring Retinal Pigment Epithelial Detachments in Eyes Undergoing Anti-VEGF Therapy**
Nishi Gulati, MD

11:12  **Scientific Session Adjourns**

**Neuro-Ophthalmology Session:**

11:15  **Introduction**
Byron L. Lam, MD

11:20  **Joel S. Glaser “A Scholar’s Scholar”**
Lanning Kline, MD

11:35  **J. Lawton Smith “Neuro-ophthalmology Icon”**
Bradley K. Farris, MD

11:50  **Remembrances and Tributes**
Robert B. Daroff, MD
Noble J. David, MD
Grant T. Liu, MD

-22-
Norman J. Schatz, MD
Robert L. Tomsak, MD, PhD

12:20 pm  Special Presentation
          Sreedhar Potarazu, MD, MBA

12:30 pm  BPEI ALUMNI ASSOCIATION BUSINESS MEETING

7:00 pm   COCKTAILS/DINNER
          LA GORCE COUNTRY CLUB
PRESENTATIONS
The Effect of Resistance Training on Microsurgical Tremor:
Phase II, Pharmacologic Intervention

Daniel B. Driscoll, MD

Primary Supervisor: Byron L. Lam, MD
Co-Authors: N/A

Purpose: The purpose of this study is to investigate whether or not an oral beta-blocker is able to attenuate micro-surgical tremor due to resistance training.

Methods: Similar methods were used for this phase of the trial as during phase I. Study subjects were first checked for baseline tremor by performing a surgical simulation and then for additional tremor and time for attenuation immediately after engaging in a series of resistance training exercises. Subjects were then given at least twenty four hours of rest and then asked to return for a second trial. During the second trial, subjects were given either placebo or ten milligrams of oral propranolol at the beginning of the resistance training exercises. The groups were then compared to see if there was a statistically significant effect of oral propranolol on attenuation of micro-surgical tremor due to the resistance training exercises.

Results: To be presented at the meeting

Conclusion: To be presented at the meeting

References:


A Retrospective Analysis of Primary Tube Results

Elma E. Kim, MD

Primary Supervisor: Michael Banitt, MD

Co-Authors: N/A

Purpose: To evaluate the results from primary glaucoma drainage implantation.

Methods: Retrospective review of results from primary tube surgeries. This study analyzes data from BPEI patients who underwent a primary tube surgery. Baseline characteristics of the study population will be tabulated for each treatment group. Patients in this retrospective data collection underwent placement of a 350mm2 Baerveldt glaucoma implant as a primary surgery. Outcome results include IOP, surgical complications, visual acuity, visual fields, glaucoma reoperation, and need for supplemental medical therapy. Data will be collected at the normal postoperative visits at 1 day, 1 week, 1 month, 3 months, 6 months, 1 year, 18 months, 2 years, 3 years, 4 years, and 5 years after surgery.

Results: TBD

Conclusion: TBD

References:


Side Cut Only Femtosecond LASIK for Treatment of Residual Refractive Errors Following LASIK

Luis J. Haddock, M.D.

Primary Supervisor: Sonia H. Yoo, M.D.

Co-Authors: Vaddavali, Pravin M.D.; Canto, Ana P. M.D.

Purpose: To evaluate the feasibility of performing a side cut only with the femtosecond laser in a previous LASIK flap to treat residual refractive errors.

Methods: A side cut only within the old LASIK flap was made with the femtosecond laser in 13 eyes of 8 patients undergoing LASIK retreatment.

Results: Mean time to retreatment was 71.3 months, average diameter of the side cut was 7.55mm (SD 0.9) within an average flap diameter of 8.87mm (SD 0.44). Mean pre operative spherical equivalent was -1.11D (SD 0.29). Mean post-operative UDVA was 0.031 (SD 0.12). No epithelial ingrowth was seen over a mean follow up period of 4.7 months

Conclusion: Side cut only femtosecond LASIK is a feasible technique to treat residual myopic refractive errors following primary LASIK.

References:
Review of Unoperated Cases with Vitreomacular Traction Syndrome at University Teaching Hospital

Lejla Mutapcic, M.D.

Primary Supervisor: Harry W. Flynn, M.D.
Co-Authors: William E. Smiddy, M.D.

Purpose:
To study the clinical course of eyes with vitreomacular traction syndrome using optical coherence tomography (OCT).

Methods:
Retrospective review.

Results:
Many studies are currently underway evaluating treatment with microplasmin vs. saline for vitreomacular traction. In contrast, most patients in our study developed complete vitreomacular separation without treatment allowing for resolution of OCT findings and improvement of visual acuity.

Conclusion:
OCT is useful tool for making the diagnosis of vitreomacular traction syndrome and demonstrating the effect of spontaneous vitreomacular traction release with resolution of cystoid macular changes as evident in most cases in our study.

References: N/A
Simultaneous Fluorescein and Indocyanine Green Angiography in The Diagnosis of Posterior Uveitis

Shalini Yalamanchi, MD

Primary Supervisor: Janet L. Davis, MD

Co-Authors: Javier Zarranz-Ventura, MD, Brenda J. Fallas, Thomas A. Albini, MD

Purpose: To evaluate the diagnostic utility of simultaneous fluorescein and indocyanine green angiography for posterior segment uveitis.

Methods: Retrospective review of uveitis patients that underwent simultaneous fluorescein and indocyanine green angiography in the uveitis clinic at Bascom Palmer Eye Institute between November 2008 through April 2010.

Results: A total of forty two patients were evaluated; thirteen males and twenty nine females. Anatomic location of uveitis included anterior/intermediate (2), intermediate (3), posterior (19) and panuveitis (18). Visual acuity was < 20/40 in 20 patients. The specific diagnoses imaged were 7 birdshot chorioretinitis, 5 Vogt Koyanagi Harada syndrome, 3 sarcoid panuveitis, 3 sympathetic ophthalmia, 2 intraocular lymphoma, 2 serpiginous choroidopathy, 2 tuberculosis uveitis, 2 benign lymphoid hyperplasia, 2 autoimmune retinopathy, 1 multifocal choroiditis, 1 punctate inner choroiditis, 1 APMPPE, and 11 miscellaneous. Fluorescein angiography was positive in 88% (37) of patients, including 38% (14) retinal vascular leakage, 57% (21) staining/leakage at lesions, 24% (9) macular leakage, 22% (8) optic nerve leakage, .08% (3) associated CNVM. ICG findings were present in 83% (35) patients, including 86% (30) hypofluorescent choroidal lesions, and .11% (4) with choroidal vascular leakage. FA and ICG were both abnormal in 76% (32) of patients, and were discordant in 53% cases. In 4 cases, lesions were present only on FA or ICG and not evident clinically. Both FA and ICG were abnormal primarily in the diagnostic categories of posterior uveitis and panuveitis (71%).
Conclusion: Simultaneous FA/ICG provides conjunctive diagnostic information in over seventy five percent of cases. In half of these cases, ICG revealed active choroidal disease that was not evident on FA. Future studies will be useful to assess the utility of angiographic changes with disease progression and response to therapy.

References:
Management Options for Submacular Perfluorocarbon Liquid

Kevin K. Suk, M.D.

Primary Supervisor: Harry W. Flynn, Jr., M.D.

Co-Authors: Harry W. Flynn, Jr. M.D.

Purpose: To report the anatomic and visual outcomes of patients with retained submacular perfluorocarbon liquid (PFCL).

Methods: Retrospective observational case series of patients with retained submacular PFCL.

Results: Eight eyes of 8 patients had retained submacular PFCL after complex retinal detachment repair. The submacular PFCL was observed without surgery 7 eyes and was surgically removed in one eye. In the surgical eye, the PFCL was juxtafoveal in location and had associated cystic macular edema. After surgical removal of the PFCL, visual acuity improved from 20/200 to 20/125 with resolution of the macular edema. The remaining 7 eyes were observed without surgery. Follow-up ranged from 10 months to 9 years, with a mean of 4.3 years. Six eyes had extrafoveal PFCL, with visual acuity ranging from 20/25 to 20/200 and 1 eye had subfoveal PFCL with 20/25 vision. Overall, the visual acuity either improved or remained stable in all 7 eyes. The anatomy of the retina and the location of the PFCL also remained stable, although in one case, a small PFCL bubble coalesced with a more posteriorly located bubble.

Conclusion: Patients with submacular PFCL can remain stable for many years. In patients with significant visual loss, surgical removal of subfoveal PFCL can be considered.

References: N/A
Agreement Between Scheimpflug Camera Imaging and Conventional Automated Keratometry in Patients Undergoing Toric Intraocular Lens Implantation

Bradford W. Lee, MD, MSc

Primary Supervisor: Anat Galor, MD

Co-Authors: Benjamin T. Lemelman, Anat Galor, MD, William J. Feuer, MS, Bozorgmehr Pouyeh, MD, Jesse S. Pelletier, MD, Pravin Vaddavalli, Sonia H. Yoo, MD

**Purpose:** To investigate agreement between Scheimpflug camera imaging (Pentacam) and conventional automated keratometry (IOL Master) in measuring corneal power, astigmatism, and axis of astigmatism in eyes undergoing toric intraocular lens (TIOL) implantation

**Methods:** Corneal power, astigmatism, and axis were pre-operatively measured in 41 subjects (49 eyes) by Pentacam and IOLMaster. Mean corneal power and astigmatism values were calculated for both technologies and Bland-Altman plots were used to investigate agreement. Mean axis measurements and mean absolute difference in axis measurements between technologies were calculated. Additionally, accuracy of prediction of spherical equivalent was compared between the two technologies.

**Results:** Mean keratometry values for Pentacam and IOLMaster (43.3D±1.6 and 43.2D±1.6, respectively) demonstrated no statistically significant difference (p=0.68). The 95% limits of agreement were moderate at -1.02 to +1.13 with a mean difference of 0.05±0.55 (SD). Mean corneal astigmatism values also demonstrated no statistically significant difference (Pentacam: 2.29D ±0.79, IOLMaster: 2.43D±0.83, p=0.12) but showed wide 95% limits of agreement ranging from -1.37 to +1.09 and a mean difference of -0.14±0.63 (SD). Mean absolute difference in axis measurements was 8.9 degrees (range: 0.3 to 37.7, SD 8.79). Thirty percent of patients had a 10 degree or greater difference in axis measurements, and 13% of patients had a 20 degree or
greater difference in measurements. There was no significant difference in mean absolute deviation from the targeted spherical equivalent of 0.65 with Pentacam and 0.58 with IOLMaster (p=0.55)

**Conclusion:** Although Pentacam and IOLMaster provide similar mean values for corneal keratometry, astigmatism, and axis in patients undergoing toric IOL implantation, they cannot be used interchangeably due to relative lack of agreement between the two modalities, particularly for astigmatism and axis. Since neither modality is currently accepted as a “gold standard” of measurement, further studies are needed to determine which device results in superior post-surgical refractive outcomes.

**References:**
Comparison of Thickness of DSAEK Lenticule in Two Different Corneal Graft Preservation Solutions

Jane Fishler, MD

Primary Supervisor: Sonia H. Yoo, MD

Co-Authors: Pravin Vaddavali, MD; Jean-Marie A. Parel, PhD

Purpose: The purpose of the study is to compare two cornea storage solutions and evaluate their effect on DSAEK lenticule thickness and endothelial cell viability.

Methods: Five paired corneas from five donors, with negative ophthalmic history but positive serologies underwent lamellar dissection with a microkeratome using a 300 micron head and an artificial anterior chamber to create a DSAEK lenticule. One donor cornea was assigned to Group A and a contralateral cornea was assigned to group B. Corneal button thickness was measured using the OCT at hour 0, 6, 12, 24, 48 and 72. Endothelial cell viability was assessed using trypan blue staining just before the processing of the cornea, immediately after and at 72 hours post-lenticule creation. The endothelium was quantitatively analyzed for percentage cell loss.

Results: The thickness of the DSAEK lenticules in each solution was analyzed at each time interval. Central and peripheral thickness was measured. The difference in corneal swelling at each time interval was plotted on a graph to determine whether one solution maintains a thinner bed of tissue over the other. The percentage of endothelial cell loss was calculated and analyzed at each time interval to determine whether handling of the tissue as well as storage of the tissue in two different storage media has an effect on the endothelial cell viability. Two different storage solutions were compared to determine whether one is more advantageous for storage of DSAEK lenticules prior to the surgery.

Conclusion: To be presented

References: N/A
Randomized Controlled Electron Microscopy Study of Infected Lacrimal Silicone Stent Biofilms

David B. Samimi, MD

Primary Supervisor: Thomas E. Johnson, MD

Co-Authors: Brett P Bielory, MD, Darlene Miller, DHSc, Wendy W. Lee, MD, Jennifer I. Hui, MD

Purpose: To correlate the presence of biofilm with clinically significant lacrimal silicone stent infection.

Methods: Lacrimal silicone stents removed early for clinically significant infection were sent to the University of Miami Center for Advanced Microscopy for scanning electron microscopy. Routinely removed, clinically non-infected implants were sent as normal controls. Images were randomized and graded by a masked observer in three categories, looking for: 1) organisms 2) matrix deposits 3) organisms within matrix. A numerical scale 0, 1, 2, 3 was used to signify none, few, moderate and heavy respectively. An overall impression of the likelihood of significant biofilm was graded in a yes or no fashion. Univariate comparison between infected and non-infected groups were performed using two sided student t-test for continous variables and chi-square test for categorical variables.

Results: Four infected and 6 non-infected stents were imaged. Average grading of organisms present were moderate-heavy (2.5) for infected stents versus none-few (0.8) for the control group (p-value 0.05). Matrix deposits were heavy (3) in infected stents and few-moderate (1.8) amongst controls (p 0.03). Organisms seen within matrix were moderate-heavy (2.3) in infected versus none-few (0.8) in controls (p 0.01). One-hundred percent (4/4) of infected implants had likely significant biofilm versus 33% (2/6) of controls (p 0.04).

Conclusion: The presence of biofilm on lacrimal silicone stents correlates with clinically significant infection leading to early stent removal.

References: N/A
Epithelial Irregularity Factor (EIF): A Novel Technique for the Management of Dry Eye Syndrome

Mohamed Abou Shousha, MD, MSc

Primary Supervisor: Victor L. Perez, MD

Co-Authors: Perez VL, MD, Feurer W, MSc, Canto AP, MD, Hoffman R, MD and Wang J, MD, PhD

Purpose: To evaluate the use of Epithelial Irregularity Factor (EIF) obtained using ultra high resolution optical coherence tomography (UHR-OCT) as a criterion to manage dry eye syndrome (DES) and detect response to treatment.

Methods: Using custom made software ocular surface irregularities of 44 eyes of 25 DES patients and 20 eyes of 13 controls were quantified and described using EIF. EIF was defined as the standard deviations of the epithelial thickness of the central 3 mm of the cornea calculated along a horizontal and vertical frame of the UHR-OCT image. Statistical differences between EIF of DES patients and control group were determined. Subjective symptoms of 36 eyes of 21 DES patients were quantified by symptoms questionnaire scores and correlated to EIF, corneal and conjunctival fluorescein staining scores, TBUT and Schirmer test. Modification of EIF by autologous serum tears therapy was tested in 16 eyes of 10 DES patients.

Results: Analysis of the corneal epithelium showed that DES patients had an irregular ocular surface that is translated to a high EIF (mean=2.41, SD=0.49) which is significantly different from that of normal subjects (mean 0.93, SD=0.24) (p<0.001). Pilot studies to test EIF reproducibility and operator dependency have shown excellent intraclass correlation coefficient of 0.94 (95% confidence interval: 0.75-0.99) and 0.96 (95% confidence interval: 0.91 – 1.00), respectively. EIF was highly significantly correlated with patients' questionnaire scores than any of the other physiological measurements studied (r=0.88; p<0.001). Multiple regression model showed that EIF alone explained 77% of the variance in the questionnaire. In an experiment to test modification of EIF by
DES therapy, EIF showed a statistically significant reduction in 16 eyes of 10 DES patients treated by autologous serum tears (p<0.001, mixed model repeated measures analysis of variance).

Conclusion: Epithelial Irregularity Factor (EIF) is a novel quantitative and qualitative criterion for the management of dry eye syndrome that correlates accurately with patients' subjective symptoms and could be used to follow up patients and detect their response to treatment.

References: N/A
Elimination of Post-Injection Topical Antibiotics After Intravitreal Injections

Rumya R. Rao, MD, MPH

Primary Supervisor: Philip J. Rosenfeld, MD, PhD

Co-Authors: Golnaz Javey, MD, Philip J. Rosenfeld, MD, PhD, William J. Feuer, MS

Purpose: To determine if the elimination of post-injection daily topical antibiotics resulted in an increase in the expected rate of endophthalmitis.

Methods: The incidence of endophthalmitis was assessed following intravitreal injections performed by one physician (PJR), who stopped the use of daily post-injection topical antibiotics following intravitreal injections on April 1, 2008. A standard protocol was used for all injections. Topical proparacaine was applied followed by a povidone-iodine (10%) scrub of the lids and lashes. A sterile lid speculum was placed, and povidone iodine (5%) drops were applied over the ocular surface three times several minutes apart. Between povidone-iodine drops, a sterile cotton swab soaked in sterile 4% lidocaine was applied to the area designated for injection in the infero-temporal quadrant. Povidone iodine 5% solution was applied to the site just prior to injection. Immediately after the injection, one drop of topical 0.5% moxifloxacin (Vigamox, Alcon Pharmaceuticals, Fort Worth, Texas) was placed into the inferior fornix in all patients injected between April 1, 2008 until June 30, 2009. Thereafter, the one drop of antibiotic was replaced with one drop of povidone iodine 5%. Following the injection, none of the patients received any additional topical antibiotics.

Results: From April 2008 through March 2011, a total of 10,332 injections were performed without the use of daily post-injection topical antibiotics. The injected medications included ranibizumab, bevacizumab, and triamcinolone acetonide. The clinical indications for injections included neovascular age-related macular degeneration, choroidal neovascularization from other causes, retinal vein occlusions, proliferative diabetic retinopathy, diabetic macular edema, cystoid macular edema, and neovascular
glaucoma. Patients were followed from 4 to 144 weeks. No cases of endophthalmitis were identified in this series. The 95% confidence interval for the true rate of endophthalmitis ranged from 0% to 0.036%.

**Conclusion:** The absence of daily post-injection topical antibiotics did not result in any cases of endophthalmitis. The rate of endophthalmitis in this series is not increased and is similar to the rates reported in the literature when topical antibiotics were used after intravitreal injections. A future clinical trial comparing endophthalmitis rates in post injection patients with and without topical antibiotics would require 85,000 injections in each group to rule out an increase in endophthalmitis rate to 0.1% (assuming a 0.06% rate for the control group using post-injection antibiotics). Given an average cost of $80 per 3-ml bottle of Vigamox, a total of $826,560 was saved during the study period. It seems as though topical betadine is adequate to prevent endophthalmitis, and the use of topical antibiotics may not be justified based on their cost and the growing epidemic of antibiotic resistant organisms.

**References:**
Retained Intraocular Foreign Bodies: Prognosis, Management, and Visual Outcomes

D. Wilkin Parke III, M.D.

Primary Supervisor: Harry W. Flynn, Jr., M.D.

Co-Authors: N/A

Purpose: To review the experience with traumatic intraocular foreign bodies at BPEI

Methods: Retrospective, consecutive series of traumatic retained IOFBs treated at BPEI between 1999 and 2008

Results: To be presented

Conclusion: To be presented

References:
Cataract Surgery and Diabetic Macular Edema: A Retrospective Analysis Using Optical Coherence Tomography

Marco A. Gonzalez, MD

Primary Supervisor: Ninel Z. Gregori, MD
Co-Authors: Anna K. Junk, MD

**Purpose:** The goal of this project is to assess the effect of simple extra-capsular cataract extraction on diabetic patients with and without diabetic macular edema.

**Methods:** We utilized ICD-9 codes for diabetes mellitus and cataract extraction to attain a database of representative patients at a teaching institution. Patients were excluded from the study if they had comorbid conditions that were deemed to exacerbate pre-existing macular edema (vein occlusion, neuroretinitis, history of radiation exposure) or if surgical extraction was deemed complicated (rupture posterior capsule, use of iris hooks). A total of 30 patients were reviewed gathering baseline characteristics, clinical endpoints and OCT parameters pre and post cataract surgery for a time period 3 months to 6 months post cataract extraction.

**Results:** All patients undergoing cataract extraction received a monthly taper of topical prednisilone and keterolac post cataract surgery. In addition, patients with more advanced maculopathy at baseline tended to receive intra-operative subconjunctival or intravitreal steroid injections. Post operative course of patients tended to vary based on pre-existing degree of maculopathy. Complete results to be presented during Residents' Days.

**Conclusion:** Mild diabetic maculopathy does not appear to worsen after simple cataract extraction. However, patients with more advanced maculopathy tend to have a more aggressive clinical course that necessitates more frequent intervention in the post-operative period.
References:
Vision Outcomes of PRK with Mitomycin C After Penetrating Keratoplasty in Adults

Guillermo Amescua, MD

Primary Supervisor: Sonia H. Yoo, MD

Co-Authors: Ana P. Canto, MD, Pravin Vaddavali, MD

Purpose: Review the results of adult patients that had PRK with Mitomycin C after Penetrating keratoplasty

Methods: Retrospective review of all patients that had PRK after PK at Bascom Palmer Miami and Bascom Palmer Palm Beach.

Results: The average interval between PKP and PRK was 56 months. The average spherical equivalent (SE) was -5.3 diopters (D); refractive cylinder +4.5D, keratometric cylinder 4.9D. The average UDVA was 1.76 logMAR and CDVA was 0.13 logMAR. A paired student t-test was performed and demonstrated a non statistically significant improvement in refractive cylinder (p=0.06), keratometric cylinder (p=0.09), and a statistically significant improvement in UDVA (p=0.02). No complications

Conclusion: PRK with Mitomycin C is a safe procedure and a good option for patients with anisometropia or high astigmatism that are intolerant to contact lenses after Penetrating keratoplasty.

The Impact of Early Cataract Grade on Ocular Imaging Scan Quality

Jonathan P. Erickson, MD

Primary Supervisor: David S. Greenfield, MD

Co-Authors: Mitra Sehi, PhD, Namita Bhardwaj, MD, Maria Cecilia Reyes, MD

Purpose: To examine the impact of crystalline lens opacity on image quality using time-domain optical coherence tomography (TDOCT), scanning laser polarimetry (SLPVCC and SLPECC), Fourier-domain OCT (FDOCT), and confocal scanning laser ophthalmoscopy (CSLO; HRT3) in a cohort of normal, glaucoma suspect and glaucoma patients.

Methods: Phakic eyes of normal, glaucoma suspect, and glaucomatous patients meeting eligibility criteria were prospectively enrolled. One eye per subject was studied. Subjects underwent complete ophthalmologic examination, and retinal nerve fiber layer (RNFL) and optic nerve head (ONH) topography measurements using TDOCT, FDOCT, SLPVCC, SLPECC, and CSLO technologies. A trained examiner (MCR) used the Lens Opacification Classification System (LOCS III) to grade cataracts and acquire two high quality images for RNFL and ONH scans. Image quality measures consisted of CSLO pixel standard deviation (SD), typical scan score (TSS) and Quality score (Q) of SLPVCC and SLPECC, signal strength (SS) of TDOCT, and signal strength index (SSI) of FDOCT. The average of two quality scores was used for the analysis. Pearson correlation coefficients were calculated to examine the impact of crystalline lens opacity on the quality of RNFL and ONH images.

Results: Thirty-five eyes of 35 patients (3 normal, 24 glaucoma suspect, 8 glaucoma) were enrolled. The average LOCS III grades for each cataract location were: nuclear 2.4, cortical 0.8, and posterior subcapsular 0.4. There was a significant correlation between nuclear cataract and CSLO pixel SD (r=0.62, p <0.001). The SS, TSS, Q, and SSI were not correlated with cataract grading.
Conclusion: Image quality scores using TDOCT, SLPVCC, SLPECC, and FDOCT are unaffected by early cataract. Mild nuclear cataract reduces the quality of CSLO images.

References:
Clinical Comparison of Two Anesthetic Preparations for Intravitreal Injection

Matthew J. Weiss, MD

Primary Supervisor: Ninel Z. Gregori, MD

Co-Authors: Raquel Goldhardt, MD

**Purpose:** To determine which of two topical anesthetic preparations patients prefer for intravitreal injections of ranibizumab with a 32 gauge needle. One preparation was a topical application utilizing three cotton swabs soaked in 4% lidocaine; the other was application of 3.5% lidocaine hydrochloride ophthalmic gel.

**Methods:** Randomized prospective clinical trial. Patients who had at least 3 previous intravitreal ranibizumab injections were divided into two strata and randomized to receive one of the two anesthetic preparations in each eye (bilateral stratum) or on subsequent visits in one eye (unilateral stratum). Bilateral stratum consisted of patients receiving an injection in each eye on the same day. Patients’ discomfort level, overall satisfaction with the preparation and injection, as well intraocular pressure (IOP), corneal staining, and subconjunctival hemorrhage (SCH) were compared. The patients were also asked which preparation method they preferred.

**Results:** 50 patients were recruited. Patients' discomfort score (1=none to 5=extremely severe) during the preparation was 2.0 (s.d.=1.1) vs 1.9 (s.d.=0.8) in the cotton swab vs gel group, respectively (P=0.4, paired t-test). Discomfort score during the injection was 1.7 (s.d.=1.0) in the cotton swab group vs 2.0 (s.d.=0.9) in the gel group (P=0.058, paired t-test.) Mean IOP immediately after injection was 41.1 mmHg (s.d.=8, range=21 to 68) vs 46 (s.d.=10, range=29 to 69) in the cotton swab vs gel eyes respectively (P=0.002). There was significantly less SCH (P=0.031, paired t-test) and corneal staining (P=0.001, paired t-test) in the gel group. When asked the next day, patients reported significantly less discomfort in the gel group vs the cotton swab group (1.5 vs 1.8, P=0.036)
**Conclusion:** The data suggest patients prefer the gel preparation, however, the cotton swabs produce a lower IOP elevation.

**References:**


2) Comparative clinical trial of topical anesthetic agents in cataract surgery: lidocaine 2% gel, bupivacaine 0.5% drops, and benoxinate 0.4% drops. Soliman MM, Macky TA, Samir MK. J Cataract Refract Surg. 2004 Aug;30(8):1716-20.


4) Comparative study of analgesic effectiveness using three different anesthetic techniques for intravitreal injection of bevacizumab. Cintra LP, Lucena LR, Da Silva JA, Costa RA, Scott IU, Jorge R.


Clinical Outcomes of Same-Day Versus Delay Pars Plana Vitrectomy for Retained Lens Fragments

Justin H. Townsend, MD

Primary Supervisor: Harry W. Flynn, MD

Co-Authors: Lisa C. Olmos, MD, MBA, William E. Smiddy, MD, Timothy G. Murray, MD, MBA

Purpose: To investigate the clinical features, visual acuity (VA) outcomes, and retinal detachment (RD) rates in patients with retained lens fragments (RLF) managed by pars plana vitrectomy (PPV) on the same day as initial cataract surgery. To compare the clinical outcomes of patients who underwent same-day PPV versus delayed PPV.

Methods: A computerized search of medical records was carried out to identify consecutive cases of RLF that underwent PPV over a 20-year period (1990-2009) at a single institution. An IRB-approved review of clinical features including VA, presence of postoperative RD and long-term complications was carried out on all patients identified meeting inclusion criteria. Cases were divided into three groups: 1) those in which PPV was performed on the same day as cataract surgery; (2) those in which PPV was performed between one day and one week of cataract surgery; and 3) those in which PPV was performed greater than one week after cataract surgery. To assess for affect of evolving surgical techniques, the 3 groups were further divided into 2 sub-groups: A) cases presenting 1990-1999; and B) cases presenting 2000-2009.

Results: To be presented at Residents' Days

Conclusion: To be presented at Residents' Days

References: N/A
Comparison of Postoperative Pain Using Frontal Block or Subconjunctival Injection for Conjunctival Muellerectomy

Chad C. Zatezalo, MD

Primary Supervisor: Wendy W. Lee, MD

Co-Authors: N/A

Purpose: To evaluate post operative pain with two different types of anesthesia.

Methods: To be presented

Results: To be presented

Conclusion: To be presented

References: To be presented
Comparison of Geographic Atrophy Measurements Obtained Using Two Different Spectral Domain OCT Imaging Strategies

Brandon W. Lee, MD

Primary Supervisor: Philip J. Rosenfeld, MD, PhD

Co-Authors: Zohar Yehoshua, MD, MHA; Carlos Alexandre Garcia Filho, MD; Fernando Penha, MD, PhD; Giovanni Gregori, PhD; Paul Stetson, PhD; William Feuer, MS

Purpose: To compare the measurement of geographic atrophy (GA) measured using spectral domain optical coherence tomography (SDOCT) with two methods of en face imaging.

Methods: SDOCT was used to scan 50 eyes of 50 patients with age-related macular degeneration (AMD) in a 200 A-scan by 200 B-scan raster pattern. The OCT fundus image (OFI) resulting from the summation of each A-scan viewed en face was compared to an enhanced OFI using only information from below the retinal pigment epithelium (RPE). The area of GA contained within the 6 x 6 mm scan area of the OFI centered on the fovea was quantified manually using a digitizing tablet by three graders. An automated algorithm was used to measure the GA area from the enhanced OFI.

Results: The agreement between the three graders with the enhanced OFI measurements was excellent (ICC = 0.999) and comparable to that between graders on the regular OFI (ICC = 0.998). The agreement was reduced, but still very good between each grader and the automated result from enhanced OFI (Grader 1: ICC = 0.794; Grader 2: ICC = 0.791; Grader 3: ICC = 0.798; Average graders: ICC = 0.795). The mean area (SD) from the enhanced OFI measurements was 6.41 mm² (4.88) and the measured area (SD) from the automated measurements was 5.27 (3.69). The automated algorithm clearly identified the boundaries of the GA in 92% of cases. In four cases, the algorithm provided an incorrect measurement of the total GA area.
Conclusion: The OFI and enhanced OFI proved to be useful in identifying and measuring GA in AMD. Automated GA measurements using the enhanced OFI provided very similar measurements when compared with manual segmentation. Both strategies are useful for following patients with GA over time and for future clinical trials on dry AMD.

References:
Intravitreal Dexamethasone in the Management of Delayed-Onset Bleb-Associated Endophthalmitis

David J. Jacobs, MD

Primary Supervisor: Harry W. Flynn, Jr, MD

Co-Authors: Avinash Pathengay, FRCS; Theodore Leng, MD, MS; Wei Shi, MS

Purpose: To report the visual acuity (VA) outcomes of delayed-onset bleb-associated endophthalmitis (BAE) with and without intravitreal dexamethasone (IVD).

Methods: Retrospective consecutive case series of BAE at Bascom Palmer Eye Institute between January 1, 1996 and December 31, 2009. VA outcomes and other clinical and microbiological data were compared using the 2-sided Student’s t-test for two groups: patients who received IVD and patients who did not receive IVD. Main outcome measures were mean logMAR change (logMARΔ) at 1 and 3 months after treatment.

Results: 84 eyes of 83 patients were identified. 71/84 (84%) received IVD, and 13/84 (16%) did not receive IVD. Mean VA before endophthalmitis was 20/90 in the IVD group and 20/70 in the group that did not receive IVD (p=0.56). Mean presenting VA was 0.9/200 in the IVD group and 1.7/200 in the group that did not receive IVD (p=0.22). Mean presenting intraocular pressure was 20 mmHg in the IVD group and 19 mmHg in the group that did not receive IVD (p=0.82). Streptococcus sp. was the causative organism in 19/71 (27%) IVD cases and 2/13 (15%) cases that did not receive IVD (p=0.38). Mean VA at 1 month after treatment was 5/200 in the IVD group and 1.8/200 in the group that did not receive IVD, logMARΔ of 0.87 and 1.56 respectively (p=0.03). Mean VA at 3 months after treatment was 7/200 in the IVD group and 3/200 in the group that did not receive IVD, logMARΔ of 0.77 and 1.33 respectively (p=0.17).

Conclusion: In the current small retrospective study, intravitreal dexamethasone resulted in improved short term VA outcomes.
Stenotrophomonas Maltophilia Endophthalmitis Following Cataract Surgery; Clinical And Microbiological Results

Jonathan S. Chang, MD

Primary Supervisor: Harry W. Flynn, Jr., MD

Co-Authors: Darlene Miller, DHSc

Purpose:
To evaluate microbiological sensitivities, clinical characteristics and treatment outcomes in patients with endophthalmitis caused by Stenotrophomonas maltophilia following cataract surgery.

Methods:
Retrospective case review of records from January 1, 1990 - June 30, 2010 at the Bascom Palmer Eye Institute (BPEI). Cases of S. maltophilia endophthalmitis were reviewed based on positive vitreous cultures in the BPEI microbiology records. Polymicrobial cases and cases not related to cataract surgery were excluded.

Results:
Of 1,345 positive vitreous cultures, nine cases of endophthalmitis from S. maltophilia were identified. Seven met inclusion criteria. In these cases, initial visual acuity ranged from 20/200-LP. Time to diagnosis was 2 to 118 days.
Treatments were either tap and inject (5) or pars plana vitrectomy with intravitreal antibiotics (2) as per the EVS. All seven isolates were sensitive to ceftazidime, and resistant to gentamicin and imipenem.
Five of seven isolates were sensitive to ciprofloxacin and four of seven were sensitive to tobramycin. Two of four tested isolates were sensitive to trimethoprim-sulfamethoxazole.
All patients received intravitreal ceftazidime as part of the initial treatment regimen. Five of the seven patients received dexamethasone. Two patients developed recurrent infections.
Final visual acuity ranged from 20/25 to 4/200 (five patients with vision 20/150 or better, one with 20/300 and one with 4/200). The patients who underwent vitrectomy had final vision 4/200 and 20/30. The five tap and inject patients had final visual acuity between 20/25 to 20/300.

**Conclusion:** We report a series of endophthalmitis from S. maltophilia, a rare source of infection following cataract surgery. Antimicrobial resistance profiles in these cases showed sensitivity to ceftazidime and mixed sensitivity to other antibiotics. Visual outcomes in these cases demonstrated vision better than 20/150 in the majority of cases.

**References:**
RPE  Maculopathy Related to Pediatric Glaucoma

Susan Azar, MD

Primary Supervisor: Audina M. Berrocal, MD
Co-Authors: Amany Hassan, MD

Purpose: The purpose of this case series is to describe a new finding in the retina in children with presumed hypotony maculopathy after baerveldt tube implantation.

Methods: The study design used for our research was a Retrospective Consecutive Case Series. Clinical notes and retcam photographs of pediatric patients with congenital glaucoma who underwent baerveldt tube implantation at one institution were compiled from 2004 to 2010. Fluorescein angiography was performed on one patient.

Results: Four cases exhibited hypopigmented lines and chorioretinal scarring in a concentric pattern to the optic disc after baerveldt tube implantation. A change in axial length was also noted in these patients.

Conclusion: We postulate that the retinal findings in this case series may be a result of macular defects in the retinal pigment epithelium after variation in intraocular pressure. Such findings, to our knowledge, have not yet been reported in pediatric patients. Additionally, our findings are not commonly found in adults with hypotony maculopathy. Increased scleral elasticity in children with hyotony maculopathy may lead to choroidal rupture and scarring.

References: N/A
Visual and Anatomic Outcomes of Epiretinal Membrane Peel After Retinal Detachment Repair in a Teaching Institution

Andrés Emanuelli, MD

Primary Supervisor: Ninel Z. Gregori, MD

Co-Authors: Ninel Z. Gregori, MD

Purpose: To assess visual and anatomic outcomes after epiretinal membrane (ERM) surgery in patients with prior retinal detachment (RD) surgery repair.

Methods: Patients who had undergone vitrectomy/membrane peel for ERM after retinal detachment repair were identified and the charts were reviewed. Information collected includes Snellen BCVA, OCT characteristics at pre-op and post-op visits (1, 3, 6 months), lens status, surgical dates, dates and characteristics of prior retinal detachment repair. Snellen acuities were converted to approximate ETDRS letter scores in order to calculate the median visual improvement at each time point. The OCT obtained at each visit was analyzed to document the presence and location of retinal fluid and to assess the appearance of IS/OS junction. The time course of recovery of the IS/OS junction, central foveal thickness (CFT), macular volume (MV) and best corrected visual acuity (BCVA) during the postoperative period was studied.

Results: Eight patients were identified, 6 with macula-off and 2 with macula-on RD. Median BCVA improved from 20 letters at pre-op to 40, 40, 58 letters at 1, 3, and 6 months, respectively. By 6-months, the CFT and MV improved in all eyes. A normal IS/OS junction and CFT seemed to correlate significantly with BCVA.

Conclusion: VA can improve significantly after ERM peel in patients with history of retinal detachment repair. VA and OCT improvements are seen through at least 6 months after surgery.
References:


Outcomes of Glaucoma Reoperations in the Tube Versus Trabeculectomy (TVT) Study

Hady Saheb, MD,CM

Primary Supervisor: Steve J. Gedde, MD

Co-Authors: Joyce C. Schiffman, MS, William J. Feuer, MS, Fouad El Sayyad, MD, Tube Versus Trabeculectomy Study Group

Purpose: To describe the outcomes of patients who underwent reoperations for glaucoma in the Tube Versus Trabeculectomy (TVT) Study

Methods: The TVT Study enrolled patients with medically uncontrolled glaucoma who had previous cataract and/or glaucoma surgery and randomized them to surgical treatment with a tube shunt (350-mm² Baerveldt glaucoma implant) or trabeculectomy with mitomycin C (MMC) (0.4 mg/ml for 4 minutes). Data were analyzed from patients who failed their assigned treatment and subsequently had additional glaucoma surgery. Outcome measures included intraocular pressure (IOP), visual acuity, use of glaucoma medications, failure (IOP > 21 mm Hg or not reduced by 20%, IOP < 5 mm Hg, reoperation for glaucoma, loss of light perception vision), and surgical complications.

Results: Additional glaucoma surgery was performed in 28% of patients in the TVT Study, including 9% in the tube group and 19% in the trabeculectomy group (p = 0.025). Follow-up (mean ± SD) was 30.0 ± 17.3 in the tube group and 31.1 ± 21.5 in the trabeculectomy group (p = 0.90). After 2 years, IOP (mean ± SD) was 15.0 ± 5.5 mm Hg in the tube group and 15.5 ± 8.3 mm Hg in the trabeculectomy group (p = 0.87). The number of glaucoma medications (mean ± SD) at 2 years was 1.1 ± 1.4 in the tube group and 1.5 ± 1.5 in the trabeculectomy group (p = 0.66). The cumulative probability of failure during the first 2 years of follow-up was 20% in the tube group and 10% in the trabeculectomy group (p = 0.59). Surgical complications developed in 2 (25%) patients in the tube group and 8 (44%) in the trabeculectomy group (p = 0.42). Reoperations to
manage complications were required in 1 (13%) patient in the tube group and 5 (28%) in the trabeculectomy group (p = 0.63).

**Conclusion:** Successful control of IOP was usually achieved in patients who had glaucoma reoperations in the TVT Study. Similar surgical outcomes were observed between the tube group and the trabeculectomy group following additional glaucoma surgery.

**References:**
Outcomes of Delayed-Onset Endophthalmitis After Cataract Surgery Involving Intraocular Lens Implant Removal

Anita R. Shirodkar, MD

Primary Supervisor: Harry W. Flynn, Jr, MD

Co-Authors: None

Purpose: To describe outcomes of delayed-onset endophthalmitis after cataract surgery involving intraocular lens implant removal.

Methods: Retrospective chart review of delayed-onset cases of culture-proven endophthalmitis.

Results: Cases of delayed-onset endophthalmitis managed at Bascom Palmer Eye Institute were identified. Findings of these cases are to be presented.

Conclusion: Many delayed-onset endophthalmitis patients presented with recurrence. Management of such cases is frequently tailored to the individual patient.

References: None
Visual Disability From Transient Diplopia

Kara M. Cavuoto, MD

Primary Supervisor: Craig A. McKeown, MD

Co-Authors: Pittaya Phamonvaechavan, MD, Amany Abdel Aziz, MD

Purpose: Transient diplopia is not generally demonstrated by conventional binocular visual field testing. We strive to develop a method of modified binocular visual field testing that can reliably detect and document the area of transient diplopia.

Methods: The field of single binocular vision can be measured on a Goldmann perimeter. After determining the field of single binocular vision with a slowly moving target, a second target is introduced. Both the primary and secondary targets are placed in the area of single binocular vision as static objects. The subject fixates on the primary object and is then asked to change fixation to the second object. Transient diplopia may occur immediately after the subject refixates on the second target. The area is then plotted by the visual field technician.

Results: We discuss the developed technique for testing and documenting transient diplopia and display the fields for five patients with transient diplopia.

Conclusion: Our study confirms that transient diplopia is a reproducible finding on our newly developed standardized testing method. The finding can be documented independent of the cause or etiology of the strabismus, size of the field of transient diplopia, or duration of symptoms. This may be clinically useful in monitoring a patient's course of disease as well as groups of patients with similar etiologies and provide a meaningful assessment of visual impairment from diplopia on which to base medicolegal judgements, as transient diplopia is not generally demonstrated by conventional binocular visual field testing.
References:


Summers CG, Lavoie JD, Letson RD. Use of a modified binocular visual field to assess cyclodiplopia. Ophthalmology. 1987 Mar;94(3):231-4

Antimicrobial Efficacy of Riboflavin/UVA on Microbes

Derek W. DelMonte, MD

Primary Supervisor: Sonia H. Yoo, MD

Co-Authors: Darlene Miller, DHSc, Jean-Marie Parel, PhD

Purpose: To demonstrate the antimicrobial properties of riboflavin/UVA against common pathogens.

Methods: Three strains of microbes (Pseudomonas aeruginosa, Staphylococcus aureus, and Aspergillus) were plated and then 20ul of (1) control (blank); (2) control (BSS); (3) riboflavin 0.1% (B2); (4) riboflavin 0.1% previously activated by UVA (B2'); (5) UVA alone (UVA); (6) riboflavin 0.1% with UVA exposure (UVA+B2) were placed in six regions of the plate. UVA light was exposed to the appropriate regions for 30 minutes and then the plate was incubated for 24 hours (PA and SA) or for 36 hours (Aspergillus). The mean growth inhibition zone (GIZ) in square millimeters was measured around the discs. All experiments were repeated in triplicate.

Results: Activated B2 (B2') and combination of B2+UVA are effective antimicrobials with a trend toward a more synergistic effect of the combination. B2 and UVA alone were not effective antimicrobials.

Conclusion: Riboflavin and UVA (280-370nm) may damage nucleic acids by direct electron transfer, production of singlet oxygen, and generation of hydrogen peroxide with formation of hydroxyl radicals. The fact that we were able to demonstrate in vitro activity of UVA/riboflavin against these microbes suggests that there may be ways of treating corneal infections using this approach. Since the results obtained in vitro do not always correlate with in vivo efficacy, further animal studies could be used to test the efficacy of this treatment for infectious keratitis.
References:
Fungal Isolates in Culture Proven Exogenous Fungal Endophthalmitis: 20 Year Review of the Clinical Spectrum of Disease

Ruwan A. Silva, MD, MPhil

Primary Supervisor: Harry W. Flynn Jr., MD

Co-Authors: Charles C. Wykoff, MD, PhD; Darlene Miller, DHSc, MPH

Purpose: To report the fungal species isolated from ocular specimens in a large series of patients with exogenous fungal endophthalmitis.

Methods: Retrospective, single institution, consecutive case series. The microbiologic and medical records of all patients treated at the Bascom Palmer Eye Institute between January 1, 1990, and June 30, 2010, for culture-proven exogenous fungal endophthalmitis were reviewed.

Results: From 151 culture proven cases of fungal endophthalmitis, exogenous fungal endophthalmitis occurred in 85 eyes, including 32 cases (38%) associated with fungal keratitis and 38 cases (45%) occurring after penetrating ocular trauma or intraocular surgery. Twenty five distinct species were isolated. Thirty three percent (28/85) of exogenous fungal endophthalmitis cases were caused by yeast species and 67% (57/85) were caused by mold species. In total, 5 yeast species and 20 mold species were isolated. The most common yeasts were Candida albicans (19/28) and Candida parapsilosis (5/28) accounting for 86% (24/28) of cases. The most common molds were Fusarium oxysporum (12/57), Fusarium species (7/57), Aspergillus fumigatus (6/57) and Aspergillus terreus (5/57) accounting for 53% (30/57) of cases.

Conclusion: This report highlights the differences between the clinical categories of exogenous fungal endophthalmitis. Although 76% of all cases were caused by molds,
most commonly Fusarium and Aspergillus, the most common fungal species varied by
clinical category

References:
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Pathologic Characteristics of Ocular Surface Squamous Neoplasms at Bascom Palmer: 2001 - 2010

Andrew A. Kao, MD

Primary Supervisor: Sander R. Dubovy, MD

Co-Authors: Anat Galor, MD; Carol L. Karp, MD

Purpose: The purpose of this study is to review the focality and pathologic grade of ocular surface squamous neoplasms (OSSN) biopsied at Bascom Palmer Eye Institute from 2001 – 2010.

Methods: A total of 711 pathology reports containing a diagnosis of “conjunctival intraepithelial neoplasia” and/or “squamous cell carcinoma” from January 1, 2001, to September 20, 2010, from 623 patients, were retrospectively analyzed. Focality of OSSN lesions and pathologic grade were documented.

Results: OSSN lesions were unifocal in 595 specimens (83.7%) and multifocal in 116 specimens (16.3%). Two-hundred and forty lesions (33.8%) were diagnosed as conjunctival intraepithelial neoplasia, with 60 of these lesions (8.4%) graded as mild, 111 lesions (15.6%) graded as moderate, and 69 lesions (9.7%) graded as severe. Carcinoma-in-situ was present in 360 lesions (50.6%), and squamous cell carcinoma was present in 89 lesions (12.5%). Pathologic grade could not be determined in 22 lesions (3.1%) due to inadequate material, fragmented tissue, or tangential sectioning.

Conclusion: In our experience, a majority of OSSN cases are unifocal, with approximately one-eighth of cases graded as invasive squamous cell carcinoma. Careful orientation and processing of biopsied tissue are important for making a pathologic diagnosis.
References:
"Wide-Field OCT Imaging of the Retina and Choroid in Stargardt Disease"

Benjamin J. Thomas, MD

Primary Supervisor: Byron L. Lam, MD

Co-Authors: Giovanni Gregori, Ph.D

**Purpose:** The aim of this study is to image and then describe the in vivo changes in patients with diagnosed Stargardt disease using the method of wide-field ocular coherence tomography (OCT). Correlations with imaging and potential staging of disease will be explored.

**Methods:** Stargardt maculopathy patients with two allele ABCA4 mutations at the Bascom Palmer Eye Institute were recruited to undergo retinal and choroidal imaging using Spectralis and Cirrus spectral domain OCT. In addition, **patients without known retinal disease were recruited to undergo equivalent testing, serving as a normal population with which to compare observed retinal features of the Stargardt population. The images were analyzed to assess choroidal thickness.**

**Results:** Awaiting full results from imaging studies.

**Conclusion:** Awaiting full results before presentation.

**References:** N/A
Bilateral Findings in Unilateral Coats' Disease

Thomas S. Shane, MD

Primary Supervisor: Audina M. Berrocal, MD

Co-Authors: Ditte J. Hess

Purpose: To describe vascular abnormalities found in the contralateral eye of patients with unilateral Coats' Disease.

Methods: Patients with clinically unilateral Coats' Disease were identified. Bilateral RetCam photography and fluorescein angiography were performed during exams under anesthesia in these patients. Images were reviewed independently by two specialists in pediatric retinal disease. Vascular abnormalities in the contralateral eye were identified and described.

Results: The majority of study subjects were found to have vascular abnormalities in their contralateral eye. These abnormalities were characterized by peripheral avascular retina bordered posteriorly by vessels running parallel to the ora serrata. Peripheral areas of leakage without aneurismal dilation were also found in some patients.

Conclusion: Patients with clinically unilateral Coats' Disease may have an unrecognized bilateral component to their disease. These findings may change our understanding of Coats' Disease and lead to novel genetic explanations for its occurrence.


Natural History of Drusen Morphology in Age-Related Macular Degeneration Using Spectral Domain Optical Coherence Tomography

Zohar Yehoshua, MD,MHA

Primary Supervisor: Philip J. Rosenfeld, MD,PhD

Co-Authors: Fenghua Wang, MD, Philip J. Rosenfeld, MD, PhD, Fernando M. Penha, MD, PhD, William J. Feuer, MS, Giovanni Gregori, PhD

Purpose: To characterize the natural history of drusen using spectral-domain optical coherence tomography (SDOCT) imaging of eyes from patients with non-exudative age-related macular degeneration (AMD).

Methods: One hundred forty three eyes of 100 patients with drusen secondary to non-exudative AMD were scanned using a spectral domain OCT. Patients' eyes were imaged using the 200X200 A-scan raster pattern contained within a 6X6mm area. Custom software was used to quantify volumetric changes in drusen over a period of at least 6 months and for as long as 24 months. Drusen volume and drusen area were measured within circular regions centered at the fovea having diameters of 3mm and 5mm. The measurements were analyzed using a suitable scale transformation. For drusen volume, a cube root transformation strategy was used.

Results: One hundred forty three eyes of 100 patients were analyzed with 69 eyes followed for 6 months, 106 eyes followed for 12 months, 48 eyes followed for 18 months, and 48 eyes followed for 24 months. The 3mm circle baseline drusen volume ranged from 0.0009mm³ to 0.7479mm³ or 0.10mm to 0.91mm using the cube root scale. On average, drusen volume and drusen area increased over time with the magnitude of the increase dependent on the length of follow-up (p=0.001, 3mm circle). In the eyes with a decrease in drusen volume, the magnitude of this decrease was
dependent on the baseline drusen volume (p=0.001, 3mm circle) and independent of the follow-up interval.

**Conclusion:** SDOCT imaging revealed a dynamic, undulating growth pattern for drusen with a tendency for drusen to increase in volume and area over time. An appreciation of the quantitative changes in drusen volume over time using SDOCT imaging provides a novel strategy for following normal disease progression and for identifying novel clinical trial endpoints to be used when investigating therapies for the treatment of non-exudative AMD.

**References:**
Orbital Echography: A 10 Year Retrospective Review of Orbital Tumors

Andrea L. Kossler, MD

Primary Supervisor: Chris R. Alabiad, MD

Co-Authors: N/A

**Purpose:** Our purpose is to assess the use of orbital ultrasound at the Bascom Palmer Eye Institute and to improve the diagnostic accuracy of orbital tumors.

**Methods:** This is a 10 year retrospective review of all orbital tumors diagnosed with orbital ultrasound and confirmed by pathologic diagnosis. A comprehensive database was created to collect histopathologic diagnosis, ultrasound diagnosis and ultrasound characteristics, including reflectivity, vascularity, measurements, compressibility, shape, and location. The accuracy of orbital ultrasound was assessed and characteristics of each orbital tumor were described and compared to previous standards.

**Results:** To be presented

**Conclusion:** Orbital echography plays a significant role in diagnosing orbital tumors, however due to the paucity of literature on ultrasound characteristics of orbital tumors, its use to date has been limited. Orbital ultrasound should be viewed as complementary to existing orbital imaging methods and, except in specific disorders, should not replace them. We believe that this database will help improve the diagnostic accuracy and utility of orbital ultrasound and that future applications of orbital ultrasound are on the horizon.

**References:**
Endophthalmitis Isolates and Antibiotic Sensitivities: An 8-Year Review of Culture-Proven Cases

Andrew M. Schimel, M.D.

Primary Supervisor: Harry W. Flynn, Jr., M.D.

Co-Authors: Darlene Miller, DHSc

Purpose: To investigate the spectrum of organisms causing culture-proven endophthalmitis and their sensitivities to commonly used antimicrobial agents.

Methods: Medical records were reviewed of all patients with culture-proven endophthalmitis at a single institution between September 31, 2002 and June 30, 2010. The outcome measures included intravitreal isolates identified as well as antibiotic sensitivities.

Results: In all, 369 organisms were isolated during the study interval. The most common organisms identified were Staphylococcus epidermidis in 32.8% (121/369), Streptococcus viridians group in 7.9% (29/369), Staphylococcus aureus in 7.6% (28/369), Candida albicans in 6.2% (23/369), other coagulase-negative staphylococci in 6.0% (22/369), Propionibacterium acnes in 5.4% (20/369), and Pseudomonas aeruginosa in 3.25% (12/369). Overall, 269 of 369 (72.9%) isolates were gram-positive organisms, 40 (10.8%) were gram-negative organisms, 58 (15.72%) were fungi, and 2 (0.5%) were viruses. For gram-positive organisms, sensitivities were the following: vancomycin 100%, gentamicin 83.4%, polymyxin 76.2%, levofloxacin 57.5%, oxacillin 54.5%, gatifloxacin 50%, ciprofloxacin 49.7%, and moxifloxacin 46.4%. For gram-negative organisms, sensitivities were the following: ceftazidime 100%, gentamicin 95.5%, ciprofloxacin 94.3%, tobramycin 89.3%, polymyxin 77.8%, and polymyxin 55.6%.

Conclusion: In considering antibiotic treatment of endophthalmitis, it is critical to recognize that no single antibiotic provided coverage for all of the microbes isolated from eyes with endophthalmitis. Combination therapy remains the recommendation as
the initial empiric treatment of suspected bacterial endophthalmitis. Appropriate
history and characteristic clinical features may justify the use of additional antifungal
agents.

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Relationship between clinical presentation and microbiologic spectrum. Ophthalmology
Modern Diagnostic Techniques: Flow Cytometry and Gene Rearrangement in the Diagnosis of Intraocular Lymphoma

Milan Shah, MD

Primary Supervisor: Janet L. Davis, MD

Co-Authors: Janet L. Davis, MD ; Thomas A. Albini, MD

Purpose: To determine and characterize the utility of flow cytometry and gene rearrangement in the diagnosis of primary intraocular lymphoma (PIOL).

Methods: Patients suspected of having primary intraocular lymphoma underwent diagnostic pars plana vitrectomy at Bascom Palmer Eye Institute by a single surgeon from 1992 – 2010. Vitreous specimens were sent for cytology, cytofluorography and/or gene rearrangement studies. Those cases that satisfied the inclusion criteria of having both flow cytometry and gene rearrangement were analyzed and reviewed along with their final clinical diagnosis. The main outcome measures were the sensitivity, specificity, positive and negative predictive values (PPV and NPV) of flow cytometry and gene rearrangement individually as well as combined in the diagnosis of intraocular lymphoma.

Results: Pending

Conclusion: Diagnostic pars plana vitrectomy with the combination of cytofluorographic and gene rearrangement studies increases the yield and sensitivity in supporting the diagnosis of primary intraocular lymphoma. These modern diagnostic techniques should be considered as an adjunct or an alternative to cytology for all vitrectomy specimens obtained from patients suspected of PIOL.

References:
The Impact of Surgical Intraocular Pressure Reduction on Visual Function Using Various Criteria to Define Visual Field Progression

Maggie B. Hymowitz, MD

Primary Supervisor: David S. Greenfield, MD

Co-Authors: Bhardwaj N, Niles P, Sehi M, Budenz DL, Greenfield DS.

Purpose: Elevated intraocular pressure (IOP) is the most important risk factor for the onset and progression of glaucoma. IOP reduction can effectively slow or halt glaucomatous visual field progression, and has been demonstrated to produce reversal of retinal ganglion cell dysfunction as measured using the pattern electroretinogram. The purpose of this study was to examine the impact of surgical IOP reduction on visual function using various methods to define visual field (VF) progression.

Methods: A retrospective chart review was conducted on consecutive glaucoma patients who underwent surgical IOP reduction between January 1, 2002 and December 31, 2007. This study was approved by the Institutional Review Board for Human Research at the University of Miami and was in agreement with the provisions of the Declaration of Helsinki. Inclusion criteria consisted of patients at least 18 years of age and no prior intraocular surgery except for uncomplicated cataract extraction, with repeatable glaucomatous visual field abnormalities detected on 10 or more reliable (less than 33% fixation losses, false-positive responses, or false-negative responses) Swedish interactive threshold algorithm standard 24–2 fields (Swedish interactive threshold algorithm standard automated perimetry, Humphrey Field Analyzer II; Carl Zeiss Meditec, Inc) in either eye. All subjects had a minimum of 5 preoperative and 5 postoperative VFs, and were followed up for a minimum of 2 years both before and after surgery. Glaucoma surgery was performed by two glaucoma specialists (DSG, DLB) and was indicated whenever there was suspected VF progression or the IOP was considered unsatisfactory for the extent of glaucomatous damage. Glaucomatous eyes had glaucomatous optic nerve damage and repeatable VF abnormalities defined as a glaucoma hemifield test result outside normal limits or pattern standard deviation.
outside 95% normal limits. All patients had prior VF experience and had undergone a minimum of two visual field tests prior to study enrollment. Visual field progression was defined using 3 methods. Method 1 employed Guided Progression Analysis (GPA; Humphrey Field Analyzer; Version 4.2) based upon statistical criteria designed for the Early Manifest Glaucoma Trial (EMGT) in which a significant change is detected in at least three points and repeated in the same points on three consecutive follow-up tests, and is categorized by GPA software as “ Likely Progression”. Method 2 used linear regression analysis of sequential visual fields to measure the slope of the visual-field index (VFI) and progression was defined as a significant (p<0.05) decline in the slope of the VFI. Method 3 used automated pointwise linear regression analysis of individual sensitivity values using Progressor software (Version 3.3; Medisoft, London) and progression was defined as a significant sensitivity loss >1dB/yr at p<0.01 at ≥2 adjacent test locations in the same hemifield. Statistical analysis was performed using JMP 8.0.2. (SAS Inc., Cary, NC). One-way analysis of variance (ANOVA) and chi-square test were utilized for the analysis.

Results: The charts of 806 patients were evaluated for enrollment. 789 patients were excluded from the analysis (755 had <10 VF examinations, 34 had co-morbid ocular disease that could impact the visual field). Seventeen eyes of 17 patients (mean age 77.9 ± 9.9 years) were enrolled. Eleven eyes underwent trabeculectomy with mitomycin C (MMC), 5 eyes underwent combined phacotrabeculectomy with MMC, and 1 eye underwent glaucoma drainage implant surgery. Mean postop IOP (11.3 ± 4.2mmHg) and medications (1.3 ± 1.3) were significantly (p<0.001 and p=0.01) reduced compared to prior to surgery (18.0 ± 3.9mmHg, 2.4 ± 0.9 respectively). Prior to surgery, 8 (47.1%) eyes did not manifest VF progression by any of the 3 criteria; 9 eyes had VF progression defined by at least one method. The number of eyes judged to have VF progression using any method during the postoperative period (3 of 17, 17.6%) was significantly (p=0.03) reduced compared to the preoperative period (9 of 17 eyes, 52.9%). Using VFI criteria, 8 eyes were judged to have preoperative VF progression and 1 eye had persistent VF progression during the postoperative period. None of the eyes judged to have preoperative VF progression using EMGT (n=4) and Progressor criteria (n=1) demonstrated persistent VF progression during the postoperative period. Eyes with postoperative progression tended to have greater mean IOP (15.0 ± 3.2 mmHg) and maximum IOP (20.0 ± 2.8 mmHg) postoperatively (p=0.09 and 0.06, respectively) compared to non-progressors (10.4 ± 4.1 and 13.8 ± 5.0 mmHg). Among eyes with preoperative VF progression, the postoperative slope of mean deviation (MD) (-0.21 ± 0.23 db/yr) was significantly (p=0.03) reduced compared with prior to surgery ( 1.01 ± 0.23 db/yr). The postoperative slopes of VFI and pattern standard deviation (PSD) ( 1.57 ± 2.26 %/yr and 0.32 ± 0.34 db/yr) were similar (p=0.26 and 0.91) compared to the preoperative period (-2.98 ± 2.86 %/yr and 0.36 ± 0.32 db/yr). The mean slope of the progressing points during the postoperative period (-0.18 ± 0.034 db/yr) was similar (p=0.13) to the preoperative period (-0.59 ± 0.69 db/yr).
Conclusion: Despite differences in the criteria used to define visual field progression, glaucoma surgical IOP reduction significantly reduces the incidence and rate of visual field progression.

References:
Ventriculoperitoneal Shunting for Idiopathic Intracranial Hypertension

Natalie A. Stanciu, MD

Primary Supervisor: Byron L. Lam, MD

Co-Authors: Joshua Pasol, MD; Potyra Aroucha, MD; Alexis Morante, MS; Norman J. Schatz, MD

Purpose: Idiopathic intracranial hypertension (IIH) can present with severe loss of vision or with ongoing vision loss despite maximal medical therapy; these situations require aggressive management with surgical interventions. To date, optimal surgical management has not been clearly defined. The object of this study was to review the cases of IIH treated with ventriculoperitoneal (VP) shunting and better understand the visual outcome and morbidity associated with this surgical technique.

Methods: Retrospective case-series review of all patients with IIH treated with VP shunt procedure at our institution between 2007-2010. Only patients who underwent VP shunting as the sole and primary surgical technique were included in our study.

Results: To be presented

Conclusion: To be presented

Choroidal Thickness in Birdshot Chorioretinopathy Using Enhanced Depth Imaging Optical Coherence Tomography

Avnish A. Deobhakta, MD

Primary Supervisor: Thomas A. Albini, MD
Co-Authors: Janet L. Davis, MD

**Purpose:** To measure choroidal thicknesses at different points using the EDI-OCT in patients with documented Birdshot Chorioretinopathy.

**Methods:** EDI-OCT images were obtained in using optical coherence tomography in 18 patients. The choroid was measured from the outer border of the RPE to the inner scleral border at 1 mm intervals of a horizontal section from 2 mm temporal to the fovea to 2 mm nasal to the fovea. A retrospective chart review was also done for each patient for which duration of uveitis, immunomodulating therapy (in particular those with fluocinolone acetonide intravitreal implants), visual acuity, and IOP were also obtained. Choroidal measurements were averaged between both eyes.

**Results:** Patients with BCR demonstrated thicker choroidal measurements early in the course of disease than previously established normals. This relationship reversed later in the disease. There was an inverse correlation between age and choroidal thickness ($r$ squared = 0.51, p-value = 0.0091). There was an inverse correlation between patients without the fluocinolone acetonide intravitreal/Retisert implant (11 total patients) and duration of uveitis ($r$ squared = 0.75, p-value < 0.001). This correlation was not found with those with the implant.

**Conclusion:** Patients with BCR have choroidal thicknesses that differ from previously established norms in the literature. This variance might be explained by the duration of uveitis and age. In addition, patients with immunomodulating therapy such as the Retisert implant may alter choroidal thickness.
Endophthalmitis Associated with Infectious Keratitis: A 15-Year Review of Microbial Isolates, Antibiotic Sensitivities, and Clinical Outcomes

Christopher R. Henry, MD

Primary Supervisor: Harry W. Flynn, Jr., MD

Co-Authors: Darlene Miller MHSc, Richard K. Forster MD

Purpose: To identify organisms, evaluate antibiotic sensitivities, and describe clinical outcomes in cases of endophthalmitis associated with infectious keratitis.

Methods: Microbiology department and clinical records were reviewed on all patients with concurrent positive corneal and vitreous cultures at the Bascom Palmer Eye Institute between January 1, 1995 and September 31, 2009. Responsible organisms and antibiotic sensitivities were recorded. Cases of viral keratitis were excluded.

Results: A single organism was identified in 24 cases and multiple organisms were identified in 6 cases. Of the primary responsible organisms, gram positive bacteria accounted for 13 cases, gram negative bacteria accounted for 10 cases, and fungi accounted for 7 cases. Sixteen cases were associated with previous penetrating keratoplasty, 6 cases were related to cataract surgery wounds, 4 cases followed foreign body trauma, and 4 cases developed from a primary keratitis. Clinical risk factors included dry eye syndrome (43% of cases), diabetes mellitus (20%), trauma (20%) and topical steroids (80%). Management strategies included topical antimicrobials (90% of cases), intravitreal antimicrobials (80%), intravitreal steroids (50%), pars plana vitrectomy (50%) and penetrating keratoplasty (23%). All gram positive isolates were sensitive to vancomycin. 100% of gram negative bacteria were sensitive to amikacin, ceftazidime, ciprofloxacin, gentamicin, tobramycin, and trimethoprim. Seven (23%) of
30 patients achieved a final visual acuity of 20/400 or greater. Twelve (40%) of 30 patients underwent enucleation or evisceration.

**Conclusion:** Gram positive bacteria were the most common isolates identified in our case series of endophthalmitis associated with bacterial keratitis and were commonly associated with previous penetrating keratoplasty. All gram positive isolates were sensitive to vancomycin. Gram negative bacteria were sensitive to a wide range of antibiotics including ceftazidime, gentamicin, and amikacin. Antibiotic sensitivity results reinforce the standard use of intravitreal vancomycin and ceftazidime in the management of endophthalmitis associated with bacterial keratitis. Additionally, fungi represented nearly one-fourth of the cases in our series and accounted for a majority of cases of endophthalmitis associated with a primary keratitis, foreign body injury, or trauma.

**References:**


Magnetomotive Optical Coherence Tomography for Detecting Magnetic Particles in the Posterior Segment of the Live Mouse Eye

Hong Jiang, MD PhD

Primary Supervisor: Sanjoy K. Bhattacharya, PhD

Co-Authors: Manik Goel, MD; Michael R. Wang, PhD; Byron L. Lam, MD; Jianhua Wang, MD

Purpose: To test the hypothesis that magnetomotive optic coherence tomography (MMOCT) and magnetic particles will enable imaging of posterior eye structures of live mouse eyes and to determine whether protein-bound magnetic nanoparticles has discernable toxicity.

Methods: A custom built, high speed, ultra-high resolution (~3 µm) MMOCT was developed for imaging biotin-coupled magnetic particles (100 nm and ~1 µm, 0.1 mM biotin in 0.7 µl injected volume) in mice eye by applying an external dynamic magnetic field gradient. The magnetomotive signals were acquired by subtracting the images obtained with and without magnetic field. Magnetic beads were imaged in vitro by embedded within agarose gel (1.5%) and in vivo in a congenic DBA/2J (D2-Gpnmb+-Sj/J mice) mouse eye. To assess toxicity, metabolic enzymatic activities (aldolase, pyruvate kinase, and malate dehydrogenase) of cell extracts were determined after incubation of primary retinal ganglion cells with magnetic particles. Three batches of 5000 cells each with 1 mM estimated biotin containing particles were used for these experiments.

Results: The MMOCT signals were successfully captured in the agarose gel with embedded magnetic beads. The MMOCT signals were also captured in the posterior segment of the mouse eyes after injecting the beads into the posterior chamber near the retina, and the signals were overlaid successfully onto the structural OCT image. The
enzymatic assays of extracts from control and cells incubated with magnetic particles show no difference in activities suggesting lack of metabolic toxicity.

**Conclusion:** To our knowledge, this is the first demonstration on the detection of particles injected into the posterior chamber of the mouse eye using MMOCT. This modality of imaging has the promise in studying optical neuritis and other posterior segment diseases. The novel method is expected to advance translational research.

**References:**
Analysis of Ranibizumab and Bevacizumab Usage Patterns in a Medicare Population

Roger A. Goldberg, MD, MBA

Primary Supervisor: Philip J. Rosenfeld, MD, PhD

Co-Authors: Ross J. Brechner, MD

Purpose: In mid-2006, ranibizumab was approved for the treatment of neovascular age-related macular degeneration (AMD), approximately one year after the introduction of intravitreal bevacizumab as an off-label therapy for AMD. Despite a relative lack of level 1 data on the efficacy and safety of bevacizumab, it gained widespread acceptance for the treatment of neovascular AMD, and, in 2008, accounted for 58% of all injections in a Medicare population. Brechner et al, in their analysis of the 2008 Medicare data, demonstrate a significant variation in the regional utilization patterns between different regions in the United States. This project aims to better understand and characterize what factors might be driving those regional differences.

Methods: Data from the 100% Medicare fee-for-service claims file for patients receiving intravitreal injections for neovascular AMD for calendar year 2008 were analyzed in a retrospective fashion. Individual injections and dollars spent were aggregated by statistical region, and correlated with an extensive array of factors, including that region's demographics, income level, density of ophthalmologists and number of retinal specialists.

Results: To be presented at Resident's Day.

Conclusion: To be presented at Resident's Day.
References:


Regional and Temporal Differences in Gene Expression of
LHBETATAG Retinoblastoma Tumors

Samuel K. Houston, MD

Primary Supervisor: Timothy G. Murray, MD

Co-Authors: Y. Pina, J. Clarke, T. Koru-Sengul, W. K. Scott, L. Nathanson, A. Schefler, T.G. Murray

Purpose: The purpose of this study was to evaluate by microarray the hypothesis that LHBETATAG retinoblastoma tumors exhibit regional and temporal variations in gene expression.

Methods: LHBETATAG mice aged 12, 16, and 20 weeks were euthanized (n=9). Specimens were taken from 5 tumor areas (apex, anterior lateral, center, base, and posterior lateral). Samples were hybridized to microarray gene chip ST 1.0 arrays. Data was preprocessed and analyzed using RMAexpress, R/Bioconductor 2.9.10 and SAS version 9.2. Genes with a p-value < 0.01 from the ANOVA models and a log2 fold change > 2.5 were considered to be differentially expressed. Differentially expressed genes were analyzed for overlap with known networks using pathway analysis tools.

Results: There were significant temporal (p < 10^-8) and regional differences in gene expression for LHBETATAG retinoblastoma tumors. At p < 0.01 and log2 fold change > 2.5 there were significant changes in gene expression for 190 genes apically, 84 genes anterolaterally, 126 genes posteriorly, 56 genes centrally, and 134 genes at the base. Differentially expressed genes overlapped with known networks, with significant involvement in regulation of cellular proliferation and growth, response to oxygen levels and hypoxia, regulation of cellular processes, cellular signaling cascades, and angiogenesis.

Conclusion: There are significant temporal and regional variations in the LHBETATAG retinoblastoma model. Differentially expressed genes overlap with key pathways that
may play pivotal roles in murine retinoblastoma development. These findings suggest mechanisms involved in tumor growth and progression in murine retinoblastoma tumors, and identify pathways to analyze at a functional level to determine significance in human retinoblastoma.

References:


Use of A Novel Device For Tissue Injection During DSAEK (Descemet's Stripping Automated Endothelial Keratoplasty)

Anil S. Vedula, MD

Primary Supervisor: Kendall E. Donaldson, MD
Co-Authors: Sonia H. Yoo, MD

Purpose: To compare forceps injection of the DSAEK graft with the novel EndoSerter injector.

Methods: Prospective non-randomized comparative interventional clinical trial comparing the traditional method of folding DSAEK tissue and inserting the graft using forceps with injecting DSAEK tissue into the anterior chamber using the DSAEK injector system. Outcome measures include endothelial graft detachment rates, graft failure, visual outcomes, and endothelial cell counts. Patients will be seen at 1 day, 1 week, 1 month, 3 months, and 6 months. The primary outcome measure will be graft survival. The secondary outcome measures will be: one week detachment rates, visual acuity at 1 week, 1 month, and 3 months, and endothelial cell counts at 3 and 6 months.

Results: To be completed in detail. The mean endothelial cell loss at 3 months appears to be less in the EndoSerter group compared with the forceps group. These results were not statistically significant, however.

Conclusion: DSAEK using either the folding technique or the novel DSAEK injector is safe and effective. Injecting DSAEK grafts with the EndoSerter may preserve more endothelial cells when compared to the folding technique.

References: N/A
The Risk Factors of Diabetic Retinopathy and Diabetic Macular Edema in the VA Patient Population

Aleksandra V. Rachitskaya, M.D.

Primary Supervisor: Jeffrey L. Goldberg, M.D., Ph.D

Co-Authors: Ninel Z. Gregori, M.D., William J. Prunty, O.D.

Purpose: To identify the risk factors predisposing the patients with newly diagnosed diabetes mellitus type II to develop diabetic retinopathy or diabetic macular edema.

Methods: Retrospective analysis of the Miami Veterans Affairs Medical Center CPRS entries.

Results: To be presented.

Conclusion: To be presented.

References:

Ganglion Cell Analysis in Myopic Individuals

Ahmad A. Aref, MD

Primary Supervisor: Donald L. Budenz, MD, MPH

Co-Authors: Fouad F. El-Sayyad, MD, William J. Feuer, MS, Joyce C. Schiffman, MS

Purpose: To determine whether retinal macular ganglion cell analysis (GCA), using a novel software algorithm, may increase the specificity of spectral-domain optical coherence tomography (SD-OCT) of myopic individuals in the diagnosis glaucoma.

Methods: Normal subjects with myopia underwent axial length measurement, automated visual field study, intraocular pressure measurement, optic nerve examination, and SD-OCT using both retinal nerve fiber layer (RNFL) and GCA scanning protocols. The more myopic eye was chosen as the study eye. The false-positive rate was calculated using various parameters of the RNFL and GCA analyses to define a positive test.

Results: To be announced.

Conclusion: To be announced.

References:
The Efficacy of Soap and Water and Bleach for the Disinfection of Gonioscopy and Laser Lenses

Ashkan M. Abbey, MD

Primary Supervisor: Ninel Gregori, MD

Co-Authors: Darlene Miller, D.H.Sc.

Purpose: To determine the efficacy of using soap and water and bleach solution for the disinfection of ophthalmic lenses that are directly applied to the corneoscleral surface of the eye.

Methods:
1. Three different bacterial strains were grown in culture media by the Bascom Palmer Microbiology Department (Staphylococcus epidermidis, Corynebacterium diptheriae, and Methicillin-resistant Staphylococcus aureus)

2. 0.1 mL of 10^6 bacterial organism culture media was added to each lens with a pipette.

3. One sterile cotton tip was placed into TBD media and subsequently was used to swab the lens concavity in a circular motion from the center to the periphery. This cotton tip was then placed in the TBD media for culture.

4. The lens was rinsed with water for 10 seconds.

5. 0.05 mL of Liquiclean solution (1 part soap and 4 parts water) was added to the lens concavity with a pipette.

6. The lens concavity was cleaned with a circular motion for 30 seconds using a sterile cotton tip.
7. The lens concavity was rinsed with water for 10 seconds.

8. The lens concavity was dried with a Kimwipe delicate task wipe.

9. One sterile cotton tip was placed into TBD media and subsequently was used to swab the lens concavity in a circular motion from the center to the periphery. This cotton tip was then placed in the TBD media for culture.

10. The lens concavity was placed in 10% Sodium Hypochlorite Bleach solution (1 part bleach and nine parts water).

a. A gonioscopy lens was soaked for 10 minutes.

b. A laser lens was soaked for 25 minutes (per Volk protocol).

11. The lens concavity was rinsed with water for 3 cycles of 1 minute.

12. The lens concavity was dried with a Kimwipe delicate task wipe.

13. One sterile cotton tip was placed into TBD media and subsequently was used to swab the lens concavity in a circular motion from the center to the periphery. This cotton tip was then placed in the TBD media for culture.

14. Steps 2 through 13 were repeated for each of 20 different lenses and for each of 3 different types of bacteria.

Results: Out of the 20 lenses inoculated with Staphylococcus epidermidis, none demonstrated growth after washing with soap and water. None of the 20 showed growth after bleach as well. Corynebacterium diphtheriae also showed no growth for both soap and water and bleach. Methicillin-resistant Staphylococcus aureus (MRSA) showed no growth after soap and water. However, 1 out of the 20 lenses showed positive growth for MRSA after cleaning with bleach.

Conclusion: Cleaning with soap and water is effective for the elimination of Staphylococcus epidermidis, Corynebacterium diphtheriae, and Methicillin-resistant Staphylococcus aureus from gonioscopy and laser lenses applied to the corneoscleral surface of the eye. The use of bleach after soap and water for further sterilization of the lens does not appear to have any added benefit, given the complete elimination of the bacteria by soap and water alone.

References:
Ultra High Resolution Ultrasound Characterize Levator Aponeurotic Disinsertion

Jonathan H. Tzu, MD

Primary Supervisor: Jennifer I. Hui, MD

Co-Authors: N/A

Purpose: To characterize disinsertion of the levator aponeurosis in patients with acquired ptosis with ultra high resolution ultrasound.

Methods: It will be explained to the patient that the study aims to demonstrate the loosened attachment of the muscle or preoperative anatomy with an ultrasound device. If they agree to participate, an ultrasound probe will be gently applied to their affected eyelid(s). The sound waves of the probe will be used to create a visual picture to show the loosened muscle attachment and other anatomical structures. They will be asked to undergo an ultrasound before surgery (to show the loosened muscle and other lid structures) and 3 months after surgery (to show the muscle has been reattached and other anatomical changes). Patients are seen 3 months post-operatively as part of their routine follow up. No additional visits will be incurred.

Results: Subjects are currently being recruited for this study. Preliminary results suggest that the levator aponeurosis appears to be thinner in eyelids with ptosis.

Conclusion: Pending

References:
2. Ultrasound biomicroscopy of the levator aponeurosis in congenital and
aponeurotic blepharoptosis.
Hoşal BM, Ayer NG, Zilelioğlu G, Elhan AH.

3. Applications of ultrasonography in ophthalmology.
Goldberg RE, Sarin LK, Meyer D, Gitter KA.

4. The Asian upper eyelid: an anatomical study with comparison to the Caucasian
eyelid.
Jeong S, Lemke BN, Dortzbach RK, Park YG, Kang HK.
In Vitro Gravimetric Flow Model to Evaluate the Use of Fenestrations in Glaucoma Drainage Implants

Gabriel T. Chong, MD

Primary Supervisor: Francisco E. Fantes, MD

Co-Authors: Yasushi P. Kato, PhD; Esdras Arrieta-Quintero, MD

**Purpose:** There is variability and limited knowledge regarding the effectiveness of fenestrations to prevent intraocular pressure elevation after non-valved glaucoma drainage implant (GDI) surgery. Therefore, an in-vitro gravimetric flow evaluation system was used to study fenestrations with and without sutures in a silicone tube.

**Methods:** Fenestrations and different types of suture in the fenestration (10-0 and 9-0 monofilament polyglactin or 8-0 braided polyglactin suture) were tested on 2 cm long silicone tubes with an internal lumen of 300 microns. Tubes were sealed on one end with silicone glue to simulate ligated GDI tubes. Two tubes left open and without fenestrations served as controls. The open end of the tube was connected to a 16-gauge needle that was connected to the 3-way stopcock. Water with a known pressure using an electronic pressure gauge measurement flowed from an adjustable, elevated reservoir via plastic tubing, exiting the silicone tube into a water-filled vial resting on a digital laboratory scale measuring to the ten thousandth gram. Weight readings were recorded at a predetermined time interval. Flow rate (µL/min) was calculated by change in weight (1 g of water equaling 1 mL) over change in time.

**Results:** Flow rate through the control tubes was 2.88 mL/min (2880 µL/min) at a pressure of 20 mmHg. No flow was noted through the sealed silicone tubes with 1 or 3 fenestrations up to a pressure of >70 mmHg. When these fenestrated tubes were bent, flow was noted at 20 mmHg and varied (0.7-9 µL/min) depending on the direction and amount of “bend”. At a pressure of 20 mmHg, tubes with 10-0 monofilament polyglactin suture in the fenestration had flow rates ranging from 1.1 to 1.4 µL/min. 9-0 monofilament polyglactin suture in the fenestration had flow rates ranging from 1.4 to
5.9 µL/min, and tubes with 8-0 polyglactin braided suture had flow rates ranging from 114.5-177.8 µL/min.

**Conclusion:** Direction and degree of bending of the tube appear to have a great effect on flow and may explain the variable clinical outcomes with fenestration use. Without bending the tube, simple slit-like fenestrations likely act as self-sealing valves and offer no ability to release pressure at physiological levels. Leaving behind suture material in a fenestration may offer a more predictable release of aqueous through a wick-like effect to lower IOP.

**References:**

Ryan F. Isom, MD

Primary Supervisor: James T. Banta, MD

Co-Authors: Joyce Schiffman, MS, Matthew Gardiner, MD, Blake Booth, MD

Purpose: To determine the current utilization of the Bascom Palmer, University of Alabama, and Massachusetts Eye and Ear Infirmary ophthalmology specific emergency rooms and identify areas where efficiency and cost-effective care may be enhanced.

Methods: Prospective survey of residents, fellows, and attendings in the ER for each patient visit over a period of at least 30 days. The survey contained information on the date of service, time of day, gender, age, duration of symptoms, physician referral, insurance status, preliminary diagnosis, and follow up date. The physician was also asked to classify the visit as emergent or non-emergent.

Results: During 30 day period, over 2,000 patients presented to the emergency departments at the three institutions. Of those visits, approximately two-thirds had completed surveys that were collected for analysis. Statistical analysis of data will be presented. Data will also be compared to the 2010 ER analysis at Bascom Palmer.

Conclusion: To be presented.


Novel SD-OCT Algorithm for Measuring Retinal Pigment Epithelial Detachments in Eyes Undergoing Anti-Vegf Therapy

Nishi Gulati, MD

Primary Supervisor: Philip J. Rosenfeld, MD, PhD
Co-Authors: Philip J. Rosenfeld, MD, PhD; Alexandre Garcia Filho, MD; Giovanni Gregori, PhD, Fernando M. Penha, MD

Purpose: To quantitatively evaluate retinal pigment epithelial detachments using a novel SD-OCT algorithm and assess whether it is an independent marker for treatment of exudative AMD with anti-VEGF therapy.

Methods: A retrospective evaluation of a select subset of patients with wet age-related macular degeneration and a retinal pigment epithelial detachment (PED) was performed. Included patients were those managed via observation for a time period, and then subsequently treated with anti-VEGF therapy. The B-Scan through the foveal center of the PED, performed on a SD-OCT, was examined. The PED at the treatment visit and the previous visits was quantified using a novel SD-OCT algorithm to measure the PED area and volume. The PED volumes at the various points (treatment and prior visits) were compared to determine if there was a change, and whether this change appeared to be an independent marker for treatment with anti-VEGF therapy.

Results: In progress

Conclusion: The quantification of retinal pigment epithelial detachments with this SD-OCT algorithm may provide an adjunctive tool in the evaluation and management of select cases of macular degeneration.

References: N/A
CME Activity: 47th Annual Residents' Days

Date(s): June 17-18, 2011

**Faculty Evaluation:** Please rate how well the presenter's objectives were met and his teaching quality:

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<td>Antimicrobial Efficacy of Riboflavin/UVA on Microbes</td>
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<td>Ruwan A. Silva, MD</td>
<td>Fungal Isolates in Culture Proven Exogenous Fungal Endophthalmitis: 20 Year Review of the Clinical Spectrum of Disease</td>
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<td>Benjamin J. Thomas, MD</td>
<td>Wide-Field OCT Imaging of the Retina and Choroid in Stargardt Disease</td>
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<td>Thomas S. Shane, MD</td>
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<td>Zohar Yehoshua, MD, MHA</td>
<td>Natural History of Drusen Morphology in Age-Related Macular Degeneration Using Spectral Domain OCT</td>
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<td>Andrew M. Schimel, MD</td>
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<td><strong>Speaker:</strong></td>
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<td><strong>Topic:</strong></td>
<td>A Novel SD-OCT Algorithm for Measuring Retinal Pigment Epithelial Detachments in Eyes Undergoing Anti-VEGF Therapy</td>
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CME Activity: 47th Annual Residents’ Days

Date(s): June 17-18, 2011

Directions: Please fill in marks like this: Not like this ✓ ☒

Professional Status

☐ Practicing Physician
☐ Fellow
☐ Resident
☐ Medical Student
☐ Nurse/ARNP/CRNA
☐ Other (please describe)_______________

Overall Evaluation

Was this conference fair, balanced, and free of commercial bias?

Yes ☐ No ☐

If no, please state reasons:

________________________________________

________________________________________

Was there adequate time for questions, comments, and discussion?

Yes ☐ No ☐

If no, please state reasons:

________________________________________

________________________________________

Was this conference venue appropriate and comfortable for this learning experience?

Yes ☐ No ☐

If no, please state reasons:

________________________________________
COURSE OBJECTIVES: At the conclusion of this learning activity are you able to:

- Compare indications and techniques for vitreoretinal surgical procedures
- Diagnose ocular infectious diseases through the use of microbiology
- Identify ocular neoplasms and other corneal conditions
- Determine appropriate use of intraocular injections
- Examine diagnostic capabilities of imaging for glaucoma and formulate treatment plans based on imaging data

This educational activity has contributed to my professional effectiveness and improved my ability to:

<table>
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<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
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<tr>
<td>Strongly Agree</td>
<td>Agree</td>
<td>Neutral</td>
<td>Disagree</td>
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- Treat/manage patients
- Communicate with patients
- Manage my medical practice

Participation in this learning activity has:

- Increased my knowledge
- Improved my competence (ability to perform)
- Enhanced my performance (will practice regularly in my workplace)
- Ensured that my patients will have improved outcomes (population health improvement)

1. I intend to make the following changes to my practice as a result of attending this learning activity.

2. Comments, suggested topics, and/or speakers you would like for future activities.
Title of CME Activity: 47th Annual Residents’ Days

Location: Bascom Palmer Eye Institute

Date: June 17-18, 2011

Instructions: Complete the information below and submit to registration desk at the end of the program to receive documentation of credit hours earned for this activity.

To receive AMA PRA Category 1 credit, you must be signed in and registered. Please complete the reverse side of this form.

Name_________________________ Degree________________

Email__________________________

(for receipt of CME Certificate of Credit)

COMPLETE THE SECTION BELOW ONLY IF THIS INFORMATION WAS NOT PROVIDED IN YOUR REGISTRATION FORM

Specialty____________________ Last 4 digits ONLY of Social Sec. # __________________________

(for credit recording purposes only)

Mailing Address________________________

City_________________________ State___________ Zip__________

Telephone_____________________ FAX________________________

This form must be completed and left at the CME registration desk at the end of the program or received in the CME office within 30 days.

Bascom Palmer Eye Institute
900 NW 17 ST
Miami, FL 33136

(Complete credit hours on reverse side)
Please check (✓) the sessions you attended:

**Friday, June 17, 2011**

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<tr>
<th>Time</th>
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<tr>
<td>8:10-8:22 AM</td>
<td>The Effect of Resistance Training on Microsurgical Tremor, Phase II, Pharmacologic Intervention</td>
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<tr>
<td>8:22-8:34 AM</td>
<td>A Retrospective Analysis of Primary Tube Results</td>
<td>12 min</td>
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<td>8:34-8:46 AM</td>
<td>Side Cut Only Femtosecond LASIK for Treatment of Residual Refractive Errors Following LASIK</td>
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<tr>
<td>8:46-8:58 AM</td>
<td>Review of Unoperated Cases with Vitreomacular Traction Syndrome at University Teaching Hospital</td>
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<tr>
<td>8:58-9:10 AM</td>
<td>Simultaneous Fluorescein and Indocyanine Green Angiography of Posterior Uveitis</td>
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<td>9:10-9:22 AM</td>
<td>Management Options for Submacular Perfluorocarbon Liquid</td>
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<td>Agreement Between Scheimpflug Camera Imaging and Conventional Automated Keratometry in Patients Undergoing Toric Intraocular Lens Implantation</td>
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<td>Randomized Controlled Electron Microscopy Study of Infected Lacrimal Silicone Stent Biofilms</td>
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<td>10:20-10:32 AM</td>
<td>Epithelial Irregularity Factor (EIF): A Novel Technique for the Management of Dry Eye Syndrome</td>
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<td>10:32-10:44 AM</td>
<td>Elimination of Post-Injection Topical Antibiotics After Intravitreal Injections</td>
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<td>10:44-10:56 AM</td>
<td>Retained Intraocular Foreign Bodies: Prognosis, Management, and Visual Outcomes</td>
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<td>10:56-11:08 AM</td>
<td>Cataract Surgery and Diabetic Macular Edema: A Retrospective Analysis Using Optical Coherence Tomography</td>
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<td>11:08-11:20 AM</td>
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<td>Clinical Comparison of Two Anesthetic Preparations for Intravitreal Injection</td>
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<td>Comparison of Postoperative Pain Using Frontal Block or Subconjunctival Injection for Conjunctival Muellerectomy</td>
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<td>1:12-1:24 PM</td>
<td>Comparison of Geographic Atrophy Measurements Obtained Using Two Different Spectral Domain OCT Imaging Strategies</td>
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<td>Intravitreal Dexamethasone in Delayed-Onset Bleb-Associated Endophthalmitis</td>
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<td>1:36-1:48 PM</td>
<td>Stenotrophomonas Maltophilia Endophthalmitis Following Cataract Surgery; Clinical and Microbiological Results</td>
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<td>RPE Maculopathy Related to Pediatric Glaucoma</td>
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<td>Visual and Anatomic Outcomes of Epiretinal Membrane Peel After Retinal Detachment Repair in a Teaching Institution</td>
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<td>Magnetomotive Optical Coherence Tomography for Detecting Magnetic Particles in the Posterior Segment of the Live Mouse Eye</td>
<td>12 min</td>
</tr>
<tr>
<td>8:58-9:10 AM</td>
<td>Analysis of Ranibizumab and Bevacizumab Usage Patterns in a Medicare Population</td>
<td>12 min</td>
</tr>
<tr>
<td>9:10-9:22 AM</td>
<td>Regional and Temporal Variations in Gene Expression in LH Beta-Tag Retinoblastoma Tumors</td>
<td>12 min</td>
</tr>
<tr>
<td>9:22-9:34 AM</td>
<td>Use of a Novel Device for Tissue Injection During DSAEK (Descemet's Stripping Automated Endothelial Keratoplasty)</td>
<td>12 min</td>
</tr>
<tr>
<td>9:34-9:46 AM</td>
<td>The Risk Factors of Diabetic Retinopathy and Diabetic Macular Edema in the VA Patient Population</td>
<td>12 min</td>
</tr>
<tr>
<td>10:00-10:12 AM</td>
<td>Ganglion Cell Analysis in Myopic Individuals</td>
<td>12 min</td>
</tr>
<tr>
<td>10:12-10:24 AM</td>
<td>The Efficacy of Soap and Water and Bleach for the Disinfection of Goniolscopy and Laser Lenses</td>
<td>12 min</td>
</tr>
<tr>
<td>10:24-10:36 AM</td>
<td>Ultra High-Resolution Ultrasound Characterize Levator Aponeurotic Disinsertion</td>
<td>12 min</td>
</tr>
<tr>
<td>10:36-10:48 AM</td>
<td>In Vitro Gravimetric Flow Model to Evaluate the Use of Fenestrations in Glaucoma Drainage Implants</td>
<td>12 min</td>
</tr>
<tr>
<td>10:48-11:00 AM</td>
<td>Ophthalmology Specific Emergency Departments Utilization Review: A Multicenter Analysis</td>
<td>12 min</td>
</tr>
<tr>
<td>11:00-11:12 AM</td>
<td>A Novel SD-OCT Algorithm for Measuring Retinal Pigment Epithelial Detachments in Eyes Undergoing Anti-VEGF Therapy</td>
<td>12 min</td>
</tr>
</tbody>
</table>

This is to certify that I have attended a total of ____ hours (not to exceed 9.75 hours).

Signature: __________________________________________ Date _______________