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CALIFORNIA STATE BOARD OF OPTOMETRY

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Madhu Chawla, OD, Committee Chair
Cyd Brandvein, Vice President
Lillian Wang, OD

PRACTICE AND EDUCATION COMMITTEE TELECONFERENCE MEETING AGENDA

May 27, 2016
8:00 AM – 9:00 AM
(or until conclusion of business)

Elihu Harris Building
1515 Clay Street, Room 11
Oakland, CA 94612

ORDER OF ITEMS SUBJECT TO CHANGE

1. Call to Order/Roll Call

2. Public Comment for Items Not on the Agenda
   Note: The committee may not discuss or take action on any matter raised during this public comment section, except to decide whether to place the matter on the agenda of a future meeting [Government Code §11125, §11125.7(a)].

3. Discussion and Possible Action on Continuing Education Course Approval Request Form Amendments; Recommendations to Full Board

4. Discussion and Possible Action on Continuing Education Course Approval Requests Pursuant to California Code of Regulations § 1536
   A. Orbit, Eyelid Lesions, & Mohs Surgery
   B. Taste of the Islands: Corneal Inlay Options vs. IOLs for Presbyopia: When to do What and Can They Co-Exist?; An Extraordinary "Retina" Tale of Great Egret Regret; Herpes Zoster: The Master Masquerader; Cataract in the Glaucoma Patient: What IOL Should I Use?; Macular Degeneration; Orbital Lumps and Bumps; Duane Syndrome; Refractive Surgery Advances: Contra Vision (topography guided) Lasik vs. SMILE; OCT & Macular Disease: Mastering the Basics; Challenging Refractive Surgery Cases: How to Manage Patients Outcomes with Advanced Technologies; Cataract Surgery: To Femto or Not to Femto; Eyelid and Periocular Cancer: The Optometric Role in Diagnosis and Management; What I Always Wanted to Ask The Glaucoma Specialist
   C. 1. Time to Smile with KAMRA or Topoguided?
      2. Update of Glaucoma Medical Treatments
      3. Cataract Surgery in Fuchs Dystrophy
      4. Retinal Care of the Myopic Patient: Considerations for Refractive Surgery
      5. Management of Corneal Ulcers
      6. The New Age of Refractive Cataract Patients
      7. Diagnosing Glaucoma: To Start or Not Start, That is the Question
      8. Retinal Imaging – OCT
      9. Myopic Treatment in Presbyopic Patients
   D. Cataract & Refractive Surgery
   E. Vitreo Retinal Procedures
   F. Glaucoma iStent Procedure

G. Ocular Herbology
H. Retinal Toxicity of Systemic Medications
I. Decision Making in Glaucoma
J. Culinary Guide to Ophthalmic Diseases
K. Idiopathic Orbital Inflammatory Syndrome
L. 2016 Maloney Vision Institute OD Dinner Educational Lecture: Cataract surgery in patients with prior refractive surgery: Consultation & Preoperative evaluation; Cataract surgery in patients with prior refractive surgery: surgery and post-op; Indications for the use of advanced lenses and femtosecond laser in cataract surgery; The Acufocus Intracorneal Inlay

5. Adjournment

The mission of the California State Board of Optometry is to protect the health and safety of California consumers through licensing, education, and regulation of the practice of Optometry.

Meetings of the California State Board of Optometry and its committees are open to the public except when specifically noticed otherwise in accordance with the Open Meeting Act. Public comments will be taken on agenda items at the time the specific item is raised. Time limitations will be determined by the Chairperson. The Committee may take action on any item listed on the agenda, unless listed as informational only. Agenda items may be taken out of order to accommodate speakers and to maintain a quorum.

NOTICE: The meeting is accessible to the physically disabled. A person who needs a disability-related accommodation or modification in order to participate in the meeting may make a request by contacting Rob Stephanopoulos at (916) 575-7184 or sending a written request to that person at the California State Board of Optometry, 2450 Del Paso Road, Suite 105, Sacramento, CA 95834. Providing your request at least five (5) business days before the meeting will help ensure availability of the requested accommodation.

CALIFORNIA STATE BOARD OF OPTOMETRY

Memo

2450 Del Paso Road, Suite 105
Sacramento, CA 95834
(916) 575-7170, (916) 575-7292 Fax
www.optometry.ca.gov

To: Practice and Education Committee Members **Date:** May 27, 2016

From: Madhu Chawla, OD
Committee Chair **Telephone:** (916) 575-7170

Subject: **Agenda Item 1 – Call to Order and Roll Call**

Dr. Madhu Chawla, O.D., Committee Chair, will call the meeting to order and call roll.

Memo

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www.optometry.ca.gov

To: Practice and Education Committee Members **Date:** May 27, 2016

From: Madhu Chawla, OD
Committee Chair **Telephone:** (916) 575-7170

Subject: **Agenda Item 2 – Public Comment for Items Not on the Agenda**

The committee may not discuss or take action on any matter raised during this public comment section, except to decide whether to place the matter on the agenda of a future meeting [Government Code §11125, §11125.7(a)].

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www.optometry.ca.gov

To: Practice and Education Committee Members **Date:** May 27, 2016

From: Robert Stephanopoulos
Assistant Executive Officer **Telephone:** (916) 575-7170

Subject: **Agenda Item 3. – Discussion and Possible Action on Continuing Education Course Approval Request Form Amendments; Recommendations to Full Board**

The Board approved a CE Application form during its February 2016 meeting. However, on April 15, 2016 the Practice and Education Committee believed the form required additional amendments. Attached is the CE Application form containing these amendments.

CALIFORNIA STATE BOARD OF OPTOMETRY

STATE BOARD OF OPTOMETRY
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CONTINUING EDUCATION COURSE APPROVAL APPLICATION

$50 Mandatory Fee

Pursuant to California Code of Regulations (CCR) § 1536, the Board will approve continuing education (CE) courses after receiving the applicable fee, the requested information below and it has been determined that the course meets criteria specified in CCR § 1536(g).

In addition to the information requested below, please attach a copy of the course schedule, a detailed course ~~and topical~~ outline ~~of the subject matter~~ and presentation materials (e.g., PowerPoint presentation). Applications must be submitted 45 days prior to the course presentation date.

Please type or print clearly.

Course Title	**Course Presentation Date**
_____	☐☐/☐☐/☐☐☐☐

Course Provider Contact Information

Provider Name		
_____ (First)	_____ (Last)	_____ (Middle)
Provider Mailing Address		
Street _____	**City** _____	**State** ____ **Zip** _____
Provider Email Address_____		

Will the proposed course be open to all California licensed optometrists?	☐ YES ☐ NO
Do you agree to maintain and furnish to the Board and/or attending licensee such records of course content and attendance as the Board requires, for a period of at least three years from the date of course presentation?	☐ YES ☐ NO

Course Instructor Information

Please provide the information below and attach the curriculum vitae for each instructor or lecturer involved in the course. If there are more instructors in the course, please provide the requested information on a separate sheet of paper.

Instructor Name		
_____ (First)	_____ (Last)	_____ (Middle)

License Number _____	**License Type** _____
Phone Number (____) _____	**Email Address** _____

I declare under penalty of perjury under the laws of the State of California that all the information submitted on this form and on any accompanying attachments submitted is true and correct.

_____ _____

Signature of Course Provider ***Date***

CALIFORNIA STATE BOARD OF OPTOMETRY

Memo

2450 Del Paso Road, Suite 105
Sacramento, CA 95834
(916) 575-7170, (916) 575-7292 Fax
www.optometry.ca.gov

To: Practice and Education Committee Members **Date:** May 27, 2016

From: Robert Stephanopoulos
Assistant Executive Officer **Telephone:** (916) 575-7185

Subject: **Agenda Item 4. – Discussion and Possible Action on Continuing Education Course Approval Requests Pursuant to California Code of Regulations § 1536.**

Pursuant to California Code of Regulations (CCR) § 1536 (f) and (g), the Board may approve continuing optometric education courses meeting the criteria set forth in the regulation:

> (f) Other continuing optometric education courses approved by the Board as meeting the criteria set forth in paragraph (g) below, after submission of a course, schedule, topical outline of subject matter, and curriculum vitae of all instructors or lecturers involved, to the Board not less than 45 days prior to the date of the program. The Board may, upon application of any licensee and for good cause shown, waive the requirement for submission of advance information and request for prior approval. Nothing herein shall permit the Board to approve a continuing optometric education course which has not complied with the criteria set forth in paragraph (g) below.
>
> (g) The criteria for judging and approving continuing education courses by the Board for continuing optometric education credit will be determined on the following basis:
>
> > (1) Whether the program is likely to contribute to the advancement of professional skill and knowledge in the practice of optometry.
> >
> > (2) Whether the instructors, lecturers, and others participating in the presentation are recognized by the Board as being qualified in their field.
> >
> > (3) Whether the proposed course is open to all optometrists licensed in this State.
> >
> > (4) Whether the provider of any mandatory continuing optometric education course agrees to maintain and furnish to the Board and/or attending licensee such records of course content and attendance as the Board requires, for a period of at least three years from the date of course presentation.

The list below and the application packets that follow are for the committee's review. Each CE application packet is presented as they were submitted to the Board.

Please use the criteria above to determine whether or not to approve each continuing education course below.

A. Orbit, Eyelid Lesions, & Mohs Surgery
B. Taste of the Islands: Corneal Inlay Options vs. IOLs for Presbyopia: When to do What and Can They Co-Exist?; An Extraordinary "Retina" Tale of Great Egret Regret; Herpes Zoster: The Master Masquerader; Cataract in the Glaucoma Patient: What IOL Should I Use?; Macular Degeneration; Orbital Lumps and Bumps; Duane Syndrome; Refractive Surgery Advances: Contra Vision (topography guided) Lasik vs. SMILE; OCT & Macular Disease: Mastering the Basics; Challenging Refractive Surgery Cases: How to Manage Patients Outcomes with Advanced Technologies; Cataract Surgery: To Femto or Not to Femto; Eyelid and Periocular Cancer: The Optometric Role in Diagnosis and Management; What I Always Wanted to Ask The Glaucoma Specialist
C. 1. Time to Smile with KAMRA or Topoguided?
   2. Update of Glaucoma Medical Treatments
   3. Cataract Surgery in Fuchs Dystrophy
   4. Retinal Care of the Myopic Patient: Considerations for Refractive Surgery
   5. Management of Corneal Ulcers
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E. Vitreo Retinal Procedures
F. Glaucoma iStent Procedure
G. Ocular Herbology
H. Retinal Toxicity of Systemic Medications
I. Decision Making in Glaucoma
J. Culinary Guide to Ophthalmic Diseases
K. Idiopathic Orbital Inflammatory Syndrome
L. 2016 Maloney Vision Institute OD Dinner Educational Lecture: Cataract surgery in patients with prior refractive surgery: Consultation & Preoperative evaluation; Cataract surgery in patients with prior refractive surgery: surgery and post-op; Indications for the use of advanced lenses and femtosecond laser in cataract surgery; The Acufocus Intracorneal Inlay

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Continuing Education Course
Approval Checklist

Title: The Orbit, Eyelid Lesions, & Mohs Surgery
Provider Name: Rachelle Lin (Orange County Optometric Society)

☒Completed Application
Open to all optometrists? ☒Yes ☐No
Maintain record agreement? ☒Yes ☐No
☐Detailed Course Description
☒PowerPoint and/or other presentation materials
☒Advertising (optional)
☒CV for EACH course instructor
☒License Verification for each course instructor
Disciplinary History? ☒Yes (below) ☐No

Dr. John J. Martinez, M.D.

OPTOMETRY

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CONTINUING EDUCATION COURSE APPROVAL APPLICATION

$50 Mandatory

Pursuant to California Code of Regulations (CCR) § 1536, the Board will approve continuing education (CE) courses after receiving the applicable fee, the requested information below and it has been determined that the course meets criteria specified in CCR § 1536(g).

In addition to the information requested below, please attach a copy of the course schedule and topical outline of the subject matter. Applications must be submitted 45 days prior to the course presentation date.

Please type or print clearly.

Course Title	Course Presentation Date
The Orbit. Eyelid Lesions & Mohs Surgery	04/12/2016

Course Provider Contact Information

Provider Name (Orange County Optometric Society)		
(Education Chair) Rachelle (First)	Lin (Last)	J. (Middle)
Provider Mailing Address Marshall B. Ketchum University		
Street 2575 Yorba Linda Blvd.	City Fullerton	State CA Zip 92831
Provider Email Address rachelle.lin@gmail.com		

Will the proposed course be open to all California licensed optometrists?	☒ YES ☐ NO
Do you agree to maintain and furnish to the Board and/or attending licensee such records of course content and attendance as the Board requires, for a period of at least three years from the date of course presentation?	☒ YES ☐ NO

Course Instructor Information

Please provide the information below and attach the curriculum vitae for each instructor or lecturer involved in the course. If there are more instructors in the course, please provide the requested information on a separate sheet of paper.

Instructor Name: Ramin (First) Tayani (Last) (Middle)	
License Number 69679	License Type CA Physician & Surgeon A
Phone Number (949) 489-2218	Email Address drtayani@tayani.com

I declare under penalty of perjury under the laws of the State of California that all the information submitted on this form and on any accompanying attachments submitted is true and correct.

Rachelle Lin — *Signature of Course Provider*

5/5/2016 — *Date*

www.oco

RSVP

April

TUESDAY
APRIL 12

1 HR OF CE

WITH DR. RAMIN TAYANI "THE ORBIT"
& DR. MARTINEZ "EYELID LESIONS & MOHS SURGERY"

+ COA TOWN HALL MEETING
+ 2016-2017 OCOS BOARD INSTALLATION

ORANGE HILL RESTAURANT
6410 E. CHAPMAN AVE., ORANGE, CA

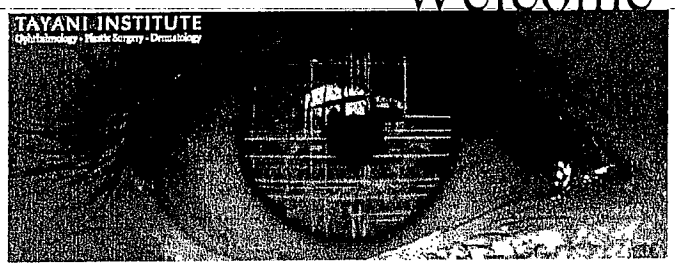
6:30 REGISTRATION / 7:00-9:00 DINNER / CE

$30 OCOS/COA
$45 NON-MEMBERS
$55 AT THE DOOR

The Orbit

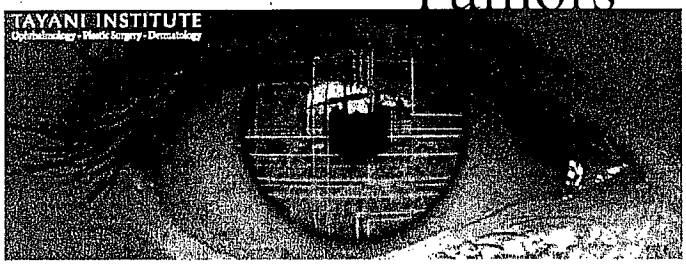
Presenter:
Ramin Tayani, MD, FAAO
Diplomate, American Board of Ophthalmology

Welcome

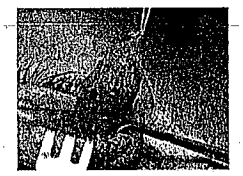


Tumors
Orbital Pseudotumor
Cellulitis
Graves
Trauma/ Orbital Fractures

Tumors

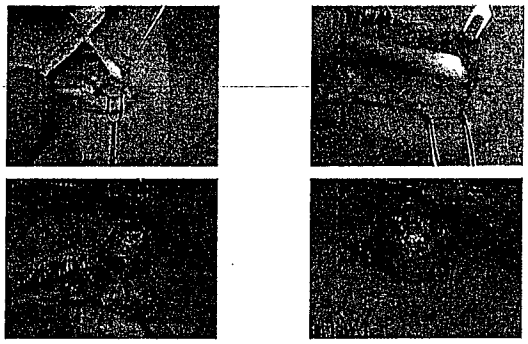


Dermoid:

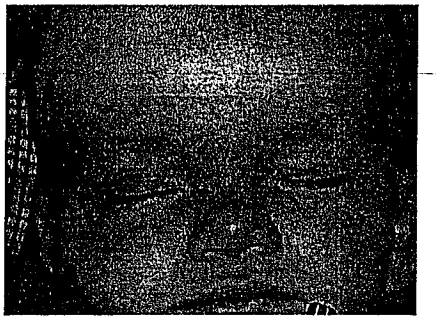


Dermoid:

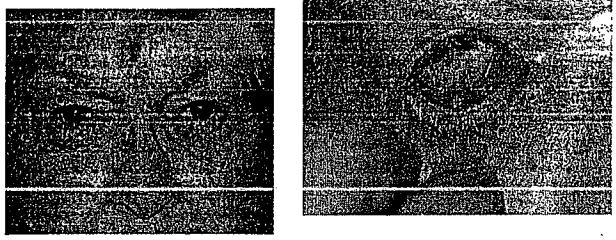
Dermoid Intra-Op Series:



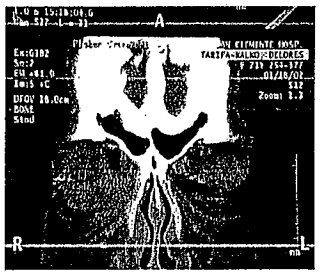
Dermoid 5-days post-op:



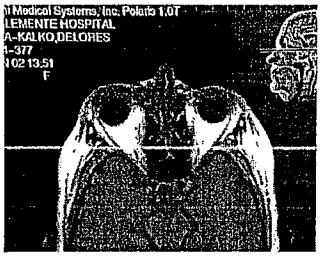
65 y/o referred for "conjunctivitis"



Preseptal mass:



MRI



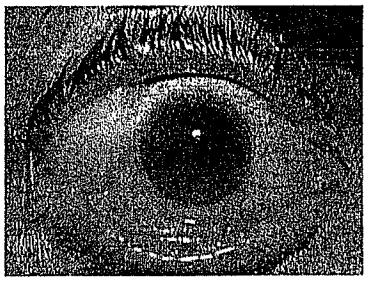
Conjunctival Tumors:

(it's not always just a pterygium)

Intra-epithelial carcinoma in-situ

Squamous cell carcinoma

Lipodermoid vs Prolapsed orbital fat:



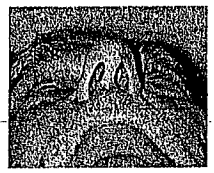
Final Diagnosis

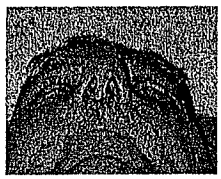
Non-Hodgkin's Lymphoma, B-Cell Type with Phenotypic Features Most Consistent with a Diagnosis of Mantle Cell Lymphoma

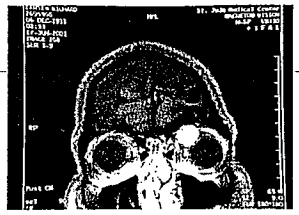
Majority of mantle cell lymphomas stain positive for CyclinD-1

These tumors do respond well to localized radiation

Orbital Tumor:



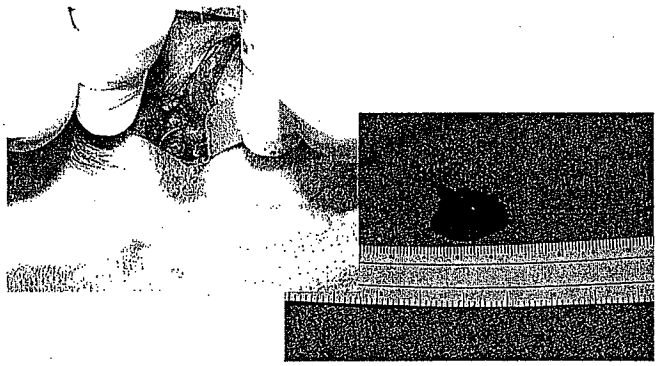




Orbital Tumor:

MRI of Left Orbit showing a large extraconal mass, vascular in nature

Orbital Tumor:



Masquerading Orbital Tumor:

72 y/o referred for surgical correction of the RUL Ptosis

Orbital Inflammatory Pseudotumor:

- Both children and adults may be affected
- Defined as an idiopathic tumorous inflammation made up of a pleomorphic inflammatory cellular response and a fibrovascular tissue reaction.
- Pt's typically present w/: acute onset of orbital pain, a red eye, restricted eye movements, and proptosis.

Pseudotumors

Orbital Inflammatory Pseudotumor:

- Both children and adults may be affected
- Defined as an idiopathic tumorous inflammation made up of a pleomorphic inflammatory cellular response and a fibrovascular tissue reaction.
- Pt's typically present w/: acute onset of orbital pain, a red eye, restricted eye movements, and proptosis.

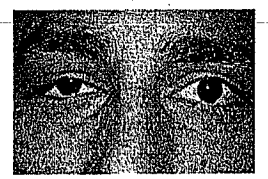
Orbital Inflammatory Pseudotumor:

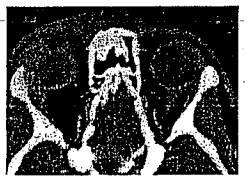
- Orbital CT scanning shows a thickened posterior sclera, orbital fat or lacrimal gland involvement, or thickening of extraocular muscles (including the tendons)
- Bilateral disease in adults should prompt a careful eval to r/o a systemic vasculitis (e.g. Wegener's graunulomatosis, polyarteritis nodosa, and lymphoma).

Orbital Inflammatory Pseudotumor:

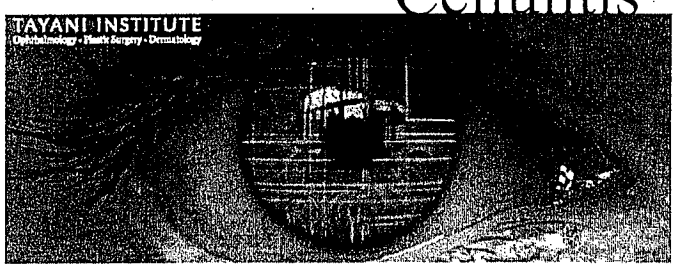
- Treatment is usually with systemic steroids
- Low dose radiation therapy may be used when the patient does not respond to systemic steroids

Orbital Pseudotumor:





Cellulitis



Preseptal Cellulitis:

Sx's: Tenderness, redness, mild fever, irritability.

Signs: erythema, edema, warmth, tenderness, NO restriction of EOM's, NO proptosis, NO pain w/ eye movement, basically <u>no</u> *Orbital signs*

Preseptal Cellulitis:

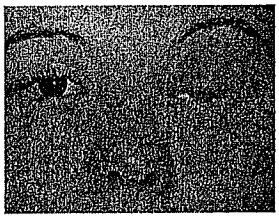
W/U: History, vitals, full eye exam (a speculum or desmarres may be necessary), LN eval, CT to r/o abscess/orbital cellulitis

Treatment: Admit pt for abx Rx if <5y/o, toxic appearance, noncomp, no improve. w/ oral Rx. O/W pt can be managed w/ oral abx and ophthalmology closely.

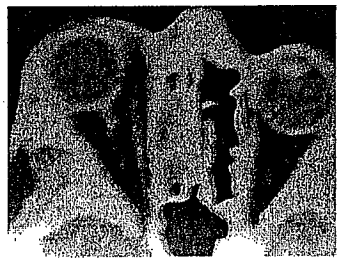
Orbital Cellulitis:

Sx's: Tenderness, redness, fever, pain, blurred VA, headache, dbl vision, irritability.

Signs: erythema, edema, warmth, tenderness, restriction of EOM's, proptosis, pain w/ eye movement,



Orbital Cellulitis:



W/U: Hx, orbital sx's, i.e. EOM, pain, APD, ON eval, proptosis, vitals, CBC, CT.*Always consider mucor in the ddx.*

Tx: Admit w/ broad spect IV abx., if getting worse, repeat CT for possible abscess.

Orbital Cellulitis:

Red eye, pain, blurred vision, fever, headache, double vision

Clinically, edema, erythema, warmth, tenderness, conjunctival chemosis, proptosis, restricted EOM

CT scan usually shows accompanying sinusitis (especially the ethmoids)

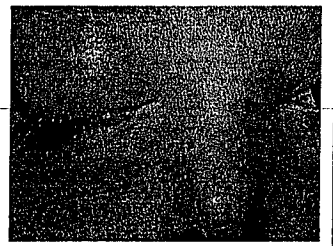
Orbital Cellulitis:

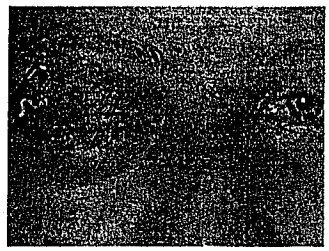
- Staphylococcus
- Streptococcus
- Haemophilus influenza (especially in children)
- Bacteroides
- Gram negative rods
- Mucormycosis must be considered in an immunocompromised individual

Orbital Cellulitis Treatment:

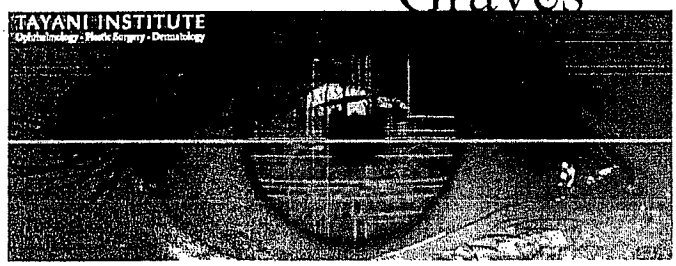
- Admit for IV abx w/ broad spectrum agents for at least one week
- Surgical drainage of sinuses and subperiosteal abscesses

Before and After:

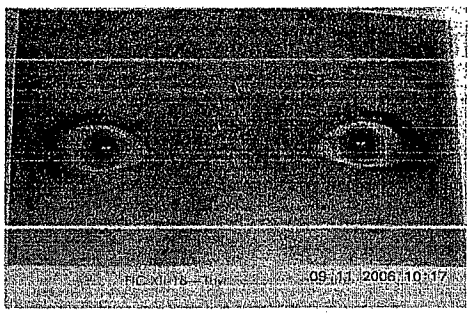




Graves



Graves Disease:



Graves Disease:

- Chronic inflammatory disease of the orbits
- Wide range of ages (avg is in the 40's)
- Females are affected 3-6x males.
- 80% have hyperthyroid, 10% are euthyroid and 10% are hypothyroid
- It is an immunologically mediated process with the extraocular muscles as the end organs.

Graves Disease:

- TRO is the most common cause of both unilateral and bilateral proptosis in adults.
- Smoking has been shown to definitely affect TRO.
- Treatment of systemic thyroid dysfunction has little predictable effect on the course of TRO.

Graves Disease:

- TSH is the most effective screening tool for systemic thyroid imbalance. Further eval is done by an internist or endocrinologist.
- A complete ophthalmic exam is done with emphasis on visual function, pupils, color vision, visual fields, ocular motility, proptosis eval and eyelid position.
- Orbital imaging is good to evaluate nerve compression and extraocular muscle status.

Graves Disease:

- Imaging studies show enlargement of the rectus muscles, mostly involving the inferior rectus followed by the medial rectus and then the superior rectus.
- Infiltration by inflammatory cells results in fibroblasts that produce mucopolysaccharides in early disease and collagen in later stages. Orbital and eyelid swelling is common early in disease. Late in the disease, the inflammation resolves and the enlarged muscles become fibrotic and scarred.

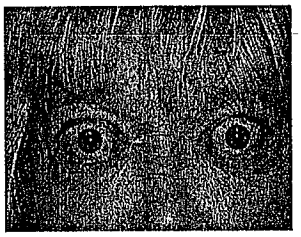
Graves Disease Treatment:

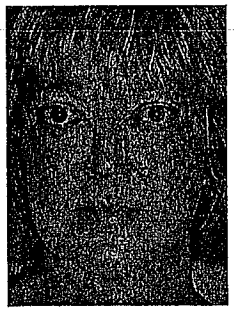
- Many patients need no treatment
- Systemic steroids can decrease active inflammation (usually temporizing until more definitve Rx is planned)
- Orbital irradiation is used without much knowledge of the exact mechanism and it takes 2-4 wks to see the effects.
- Surgery...

Graves Surgical Treatment:

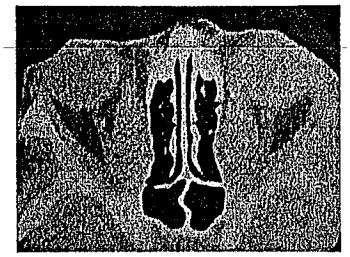
- Surgery is emergent only if optic nerve compression is evidenced. Usually it is not indicated emergently and instead is for proptosis, dbl vision, and for restrictive myopathy.
- Surgery falls into 3 categories: orbital decompression, muscle surgery, and eyelid surgery.

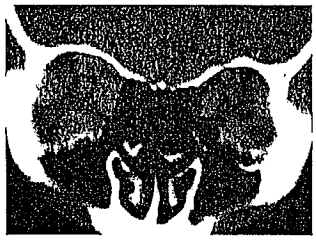
Orbital Decompression:



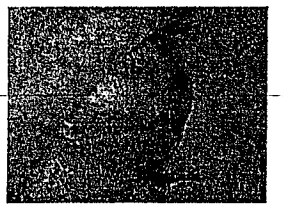


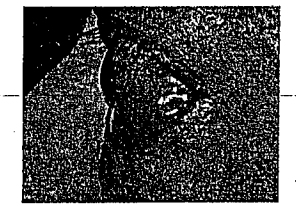
Graves CT Axial and Coronal:

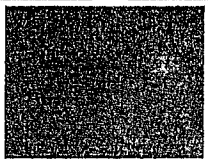




Other Sequela of Graves:

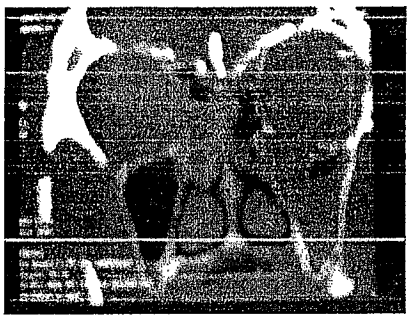






Trauma

Orbital Floor Fracture:



Orbital Fracture:

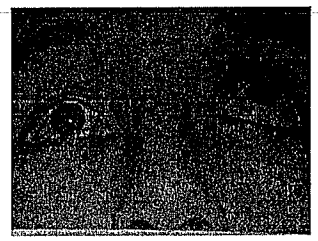
Symptoms: Pain (wh/ is usually exacerbated with EOM), tenderness, binocular diplopia, eyelid swelling after nose blowing, recent hx of trauma.

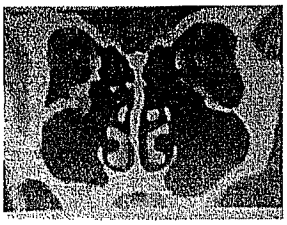
Signs: Restricted EOM, Subcut and/or subconj emphysema, hypesthesia, step-off, enophthalmos,

Work-up: Complete globe exam, EOM eval, globe displacement, check for crepitus, consider forced ductions, CT scan w/ coronal & axial views.

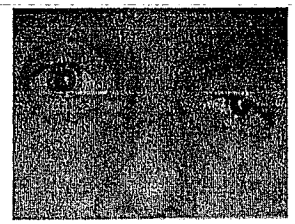
Plan: Not all fx's need fixing! Nasal decongest, Oral abx, no nose blow, ice packs, HOB up, sx w/l 1-2 wks, Operate for lg fx, enophthal., entrapment, or persistent diplopia

Orbital Fracture:



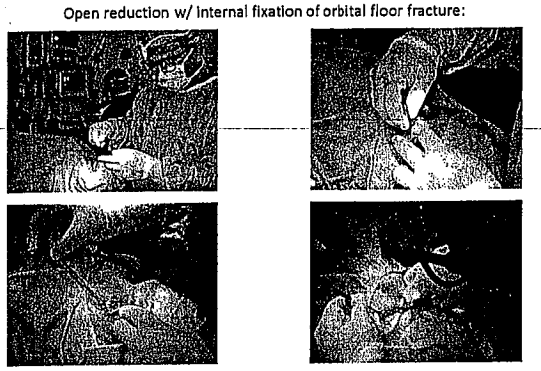


Large Orbital Tripod Fracture:

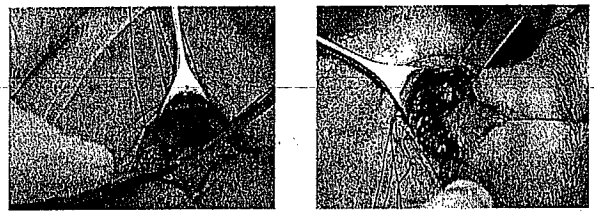


Procedure:

Open reduction w/ internal fixation of orbital floor fracture:



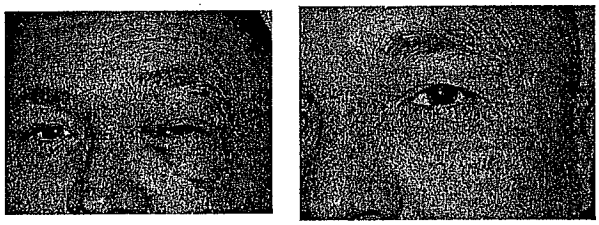
Procedure:



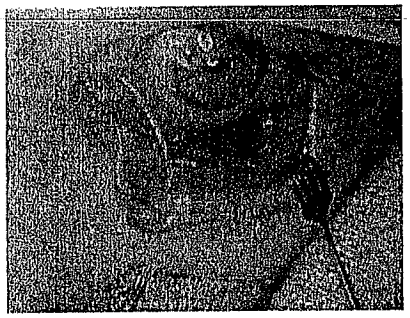
Procedure:

Orbital Fracture:

Open orbital fracture with facial laceration



Canalicular Laseration:



"Football Player at Night"

His wife said "You saved my husband's life"

Traumatic Retrobulbar Hemorrhage:

- Pain, dec. vision, hx of trauma to eye or orbit.
- Sx's: Proptosis with resistance to retropulsion, diffuse subconj hem & ecchymosis, limited EOM.
- W/U: APD, VA, Color plates, IOP, CT scan, but if VA is threatened, do the canthotomy/cantholysis ASAP.

Ruptured Globe:

Ruptured Globe:

Symptoms: Pain, dec VA, hx of trauma

Signs: Usually SCH, shallow AC, hyphema, limited EOM, intraocular contents may be outside the globe, low IOP (can also be nl/high), *irregular pupil*, VH, etc...

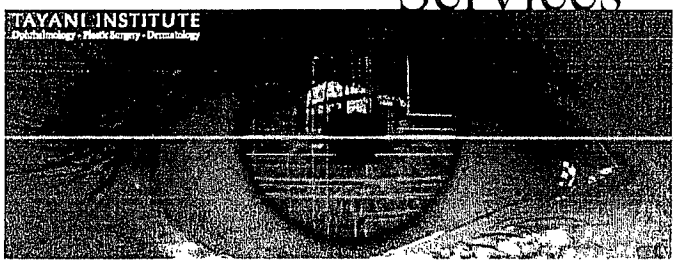
Work-up: Once a dx of RG is made the more extensive examination should be performed in the OR in a more controlled envmnt.

Plan: Immediate fox shield on eye, NPO, IV abx, antiemetics, and Tetnus toxoid, CT scan, arrange for surgical repair.

Services

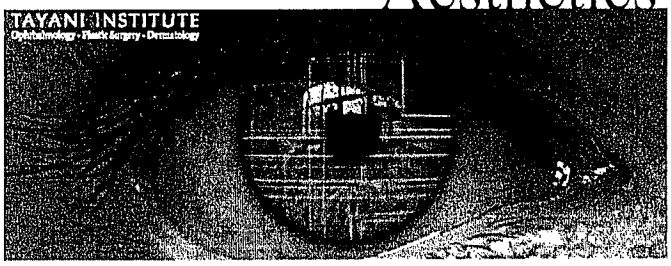
General Eye Care
- Laser Eye Surgery
- No-Stitch, No-Needle Cataract Surgery
- Advanced Medical and Surgical Treatments of Glaucoma
- Diabetic Eye Diseases
- Infections of the Eye
- Macular Degeneration
- Tearing and Dry Eyes
- Vision Correction

Reconstructive Eye Services
- Graves (Thyroid) Disease
- Drooping/Non-Closing Eyelids
- Correction of Eyelid Abnormalities
- Reconstructive Trauma Surgery
- Eyelid Cancers
- Orbital Diseases and Abnormalities



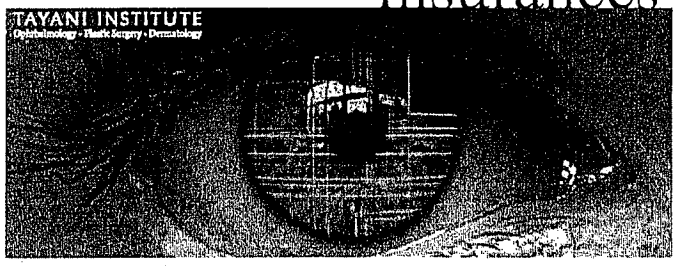
Aesthetics

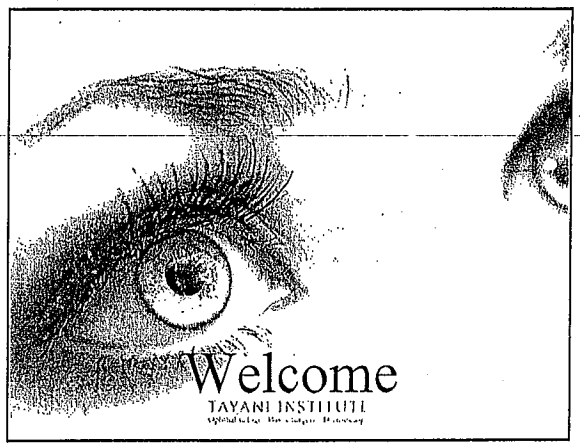
Aesthetic Eye & Facial Surgery
- Blepharoplasty
- Droopy Eyelid Rejuvenation & Enhancement
- Small-Incision Endoscopic Brow Lift
- Fat Pocket Reduction
- Correction of Eyelid Abnormalities
- Post-Cancer Beautification
- Eye & Face Reconstruction
- Scar Revision
- Laser Resurfacing
- Upper and Mid Face Lift

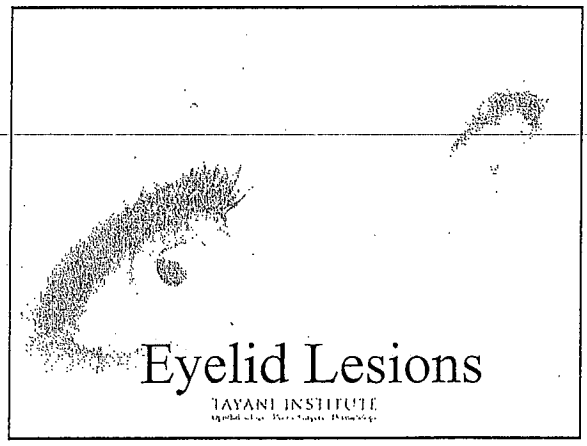


Insurances

- Most PPO's
- Monarch
- Cal Optima
- MHAP
- Medicare
- Regal







The Spectrum and Finesse of Oculoplastic Surgery

presented by

Ramin Tayani, MD, FAAO

Diplomate, American Board of Ophthalmology

Benign Lesions

- Chalazia
- Actinic Keratosis
- Seborrheic Keratosis
- Atopic Dermatitis
- Capillary Hemangioma
- Cutaneous Horn
- Squamous Papilloma
- Cyst of Moll, Zeis,
- Hidrocystoma
- Sebaceous Cyst
- Acquired Nevus
- Kissing Nevus
- Xanthelasma
- Irritated Hordeolum
- Pyogenic Granuloma
- Irritated Gland of Zeis

Occuloplastic Surgery

- Reconstructive
  - Eyelid Lesions
  - Eyelid Malpositions
  - Lacrimal
  - Orbit
- Cosmetic
  - Upper Lid Blepharoplasty
  - Lower Lid Blepharoplasty
  - Brow Lifts
  - Laser Resurfacing

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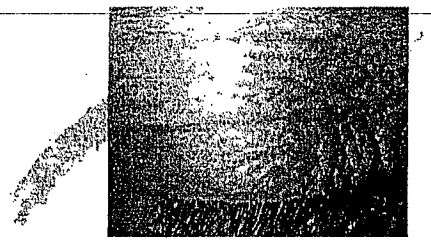
Malignant Lesions:

- Madarosis
- BCC
- Keratoacanthoma
- Kaposi Sarcoma
- Molloscum Contagiosum
- Irritated Gland of Zeis
- SCC
- Sebaceous Cell Carcinoma
- Maliganant Melanoma

Eyelid Lesions

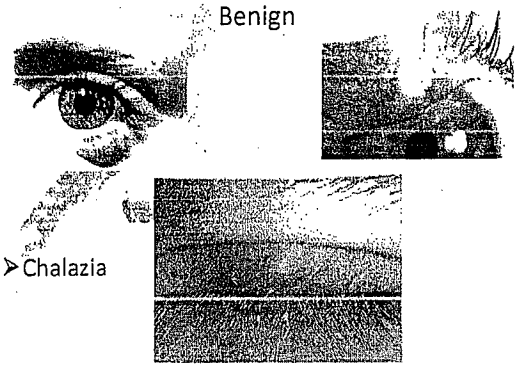
- Benign- generally "look benign"! These lesions are smooth, less vascular, don't damage adjacent tissues, etc
- Malignant- look "angry", "ugly", "worrisome". These lesions are irregular, vascular, cause madarosis, destroy local tissue, are fast grwoing, etc.

Eyelid Lesions
Benign



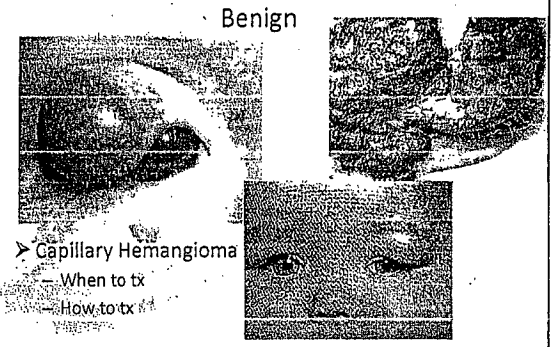
➢ Atopic Dermatitis

Eyelid Lesions
Benign



➢ Chalazia

Eyelid Lesions
Benign



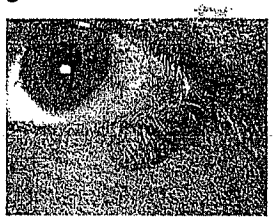
➢ Capillary Hemangioma
- When to tx
- How to tx

Eyelid Lesions
Benign

➢ Actinic Keratosis

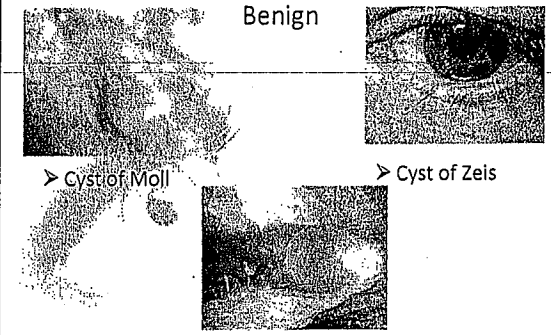
Eyelid Lesions
Benign

➢ Cutaneous Horn



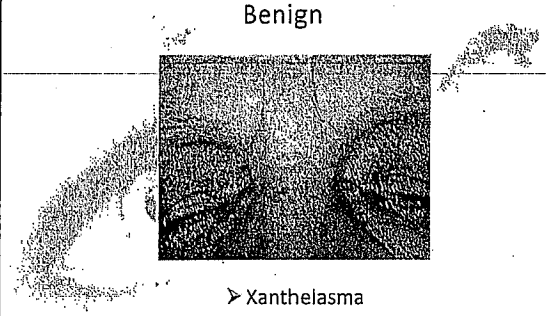
➢ Squamous Papilloma

Eyelid Lesions
Benign



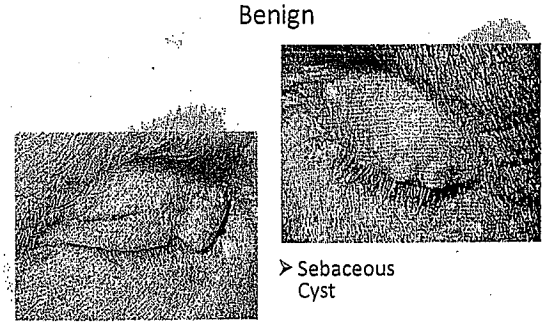
- Cyst of Moll
- Cyst of Zeis
- Eccrine Hidrocystoma

Eyelid Lesions
Benign



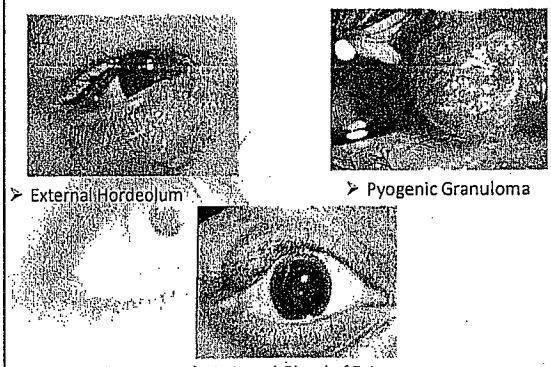
- Xanthelasma

Eyelid Lesions
Benign



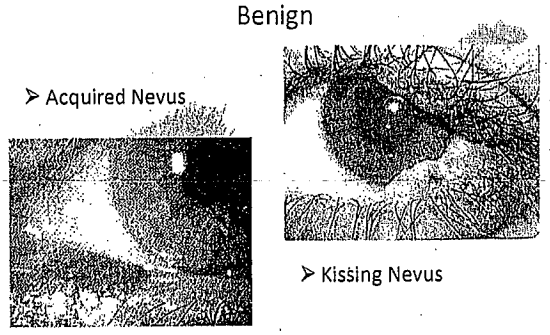
- Sebaceous Cyst

"Irritated" Benign Eyelid Lesions



- External Hordeolum
- Pyogenic Granuloma
- Irritated Gland of Zeis

Eyelid Lesions
Benign



- Acquired Nevus
- Kissing Nevus

Malignant Eyelid Lesions

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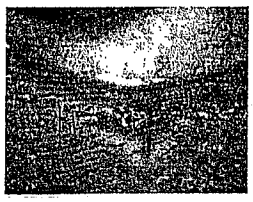
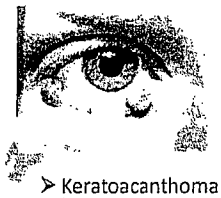
Eyelid Lesions
Malignant

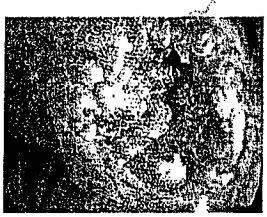


- Malignant- look "angry", "ugly", "worrisome". These lesions are irregular, vascular, cause madarosis, destroy local tissue, are fast grwoing, etc.

➢ Madarosis

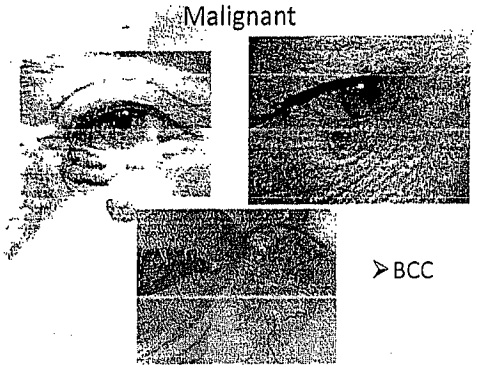
Eyelid Lesions
Benign/Malignant





➢ Keratoacanthoma

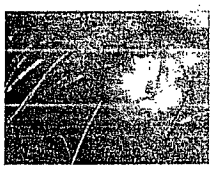
Eyelid Lesions
Malignant



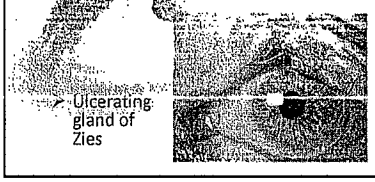
➢ BCC

Eyelid Lesions
Malignant

➢ Kaposi Sarcoma

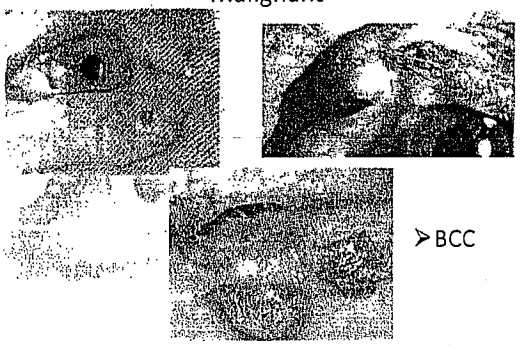


➢ Molloscum Contagiousum



➢ Ulcerating gland of Zies

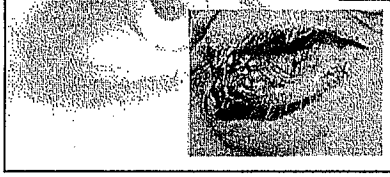
Eyelid Lesions
Malignant



➢ BCC

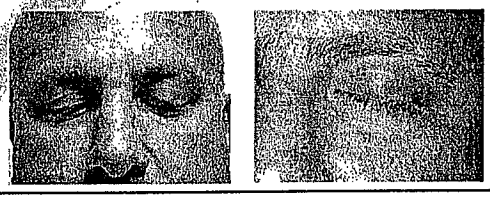
Eyelid Lesions
Malignant

➢ Malignant Melanoma



Eyelid Lesions Before & After

➢ Chalazion



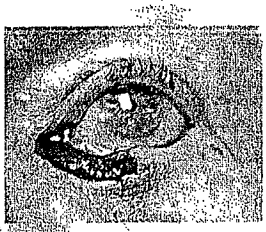
Before & After Malignant Eyelid Lesions

➢ BCC of lower lid margin

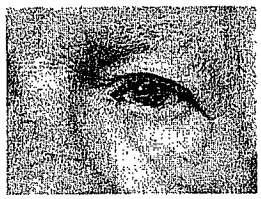
Before & After Malignant Brow Lesions

➢ Squamous cell carcinoma pre and post op

Before & After Malignant Eyelid Lesions

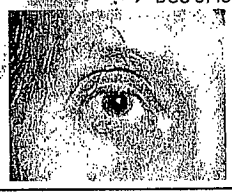


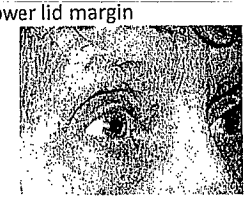
➢ BCC of lower lid margin



Before & After Malignant Eyelid Lesions

➢ BCC of lower lid margin





Opthalmic Services

General Eye Care

- Laser Eye Surgery
- No-Stitch, No-Needle Cataract Surgery
- Advanced Medical and Surgical Treatments of Glaucoma
- Diabetic Eye Diseases
- Infections of the Eye
- Macular Degeneration
- Tearing and Dry Eyes
- Vision Correction

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- Graves (Thyroid) Disease
- Drooping/Non-Closing Eyelids
- Correction of Eyelid Abnormalities
- Reconstructive Trauma Surgery
- Eyelid Cancers
- Orbital Diseases and Abnormalities

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Aesthetic Services

Aesthetic Eye & Facial Surgery
- Blepharoplasty
- Droopy Eyelid Rejuvenation & Enhancement
- Small-Incision/Endoscopic Brow Lift
- Fat Pocket Reduction
- Correction of Eyelid Abnormalities
- Post-Cancer Beautification
- Eye & Face Reconstruction
- Scar Revision
- Laser Resurfacing
- Upper and Mid Face Lift

JAYANI INSTITUTE

653 Camino Del Los Mares
Suite 107
San Clemente, CA 92673

949-489-2218
949-496-3604 Fax

CURRICULUM VITAE

RAMIN TAYANI, M.D., M.P.H.

Personal:

AKA:	Ramin Tayyanipour (official name change in 2/97)
DOB:	August 2, 1965
Citizenship:	U.S.A.
Marital Status:	Married 12/28/90
Children:	Arya Tayani (DOB: 2/22/97) Nadia Tayani (DOB: 2/10/99) Saara Tayani (DOB: 7/6/00)
CA License #:	A069679
DEA License #:	BT6474770
Board Certified:	May 2006 Diplomate, American Board of Ophthalmology

Professional Appointments:

February 3, 2009 – present: **President and Medical Director**, DermaBare of Mission Viejo, Mission Viejo, CA

May 24, 2008 – present: **President, Founder and Medical Director,** West Coast Center for Surgeries, San Clemente, CA

January, 2001 – present: **Chief Ophthalmology,** San Clemente Hospital and Medical Center, San Clemente, CA

November, 2000 – 2008: **Assistant Clinical Professor of Ophthalmology,** UCI Department of Ophthalmology, Division of Ophthalmic Plastic and Reconstructive Surgery and General Ophthalmology, Irvine, CA

March 27, 2000 – present: **President, Founder and Medical Director,** Ramin Tayani, M.D., Inc, San Clemente, CA

Medical Staff Appointment at the following Hospitals:

- San Clemente Hospital and Medical Center, San Clemente, CA
- Mission Regional Medical Center, Mission Viejo, CA
- Mission Regional Medical Center, Laguna Beach, CA
- Saddleback Memorial Medical Center, Laguna Hills, CA
- Saddleback Memorial Medical Center, San Clemente, CA
- Hoag, Irvine, CA
- Hoag, Newport Beach, CA
- Children's Hospital of Orange County, Mission Viejo, CA
- UCI Medical Center, Orange, CA
- Bear Valley Community Hospital, Big Bear Lake, CA
- Mountain Community Hospital, Lake Arrowhead, CA

Appointment at the following Ambulatory Surgical Centers:

- West Coast Center for Surgeries
- Pacific Hills Surgery Center
- Mission Ambulatory Surgical Center

Education:

7/99 – 10/99 ***Preceptorship***
Private preceptorships throughout the county with various experts in cosmetic surgery (Dermatologists, Facial Plastic Surgeons, and Oculoplastics Specialist)

7/98 – 8/99 ***Fellowship***
Harvard University, Mass. Eye and Ear Infirmary
Department of Ophthalmology
Ophthalmic Plastic & Reconstructive Surgery, & Ophthalmic Pathology

7/98 – 8/99 ***Fellowship***
Harvard University, Mass. Eye and Ear Infirmary
Department of Ophthalmology
Ocular Oncology

7/97 – 7/98 ***Chief Resident***
The Eye Institute, Medical College of Wisconsin
Department of Ophthalmology

7/95 – 7/98 ***Residency in Ophthalmology***
The Eye Institute – Medical College of Wisconsin
Department of Ophthalmology

6/94 – 7/95 ***Internship***
Yale University
Internal Medicine, Primary Care Track

9/88 – 6/94 ***Medical Degree***
University of California, Irvine
M.D., California College of Medicine

6/90 – 9/91 ***Research Associate***
University of California, San Francisco

6/87 – 3/90 ***Masters Degree***
University of California, Los Angeles
M.P.H., School of Public Health
Division of Health Policy and Management

9/82 – 6/87 ***Undergraduate Double Major***
University of California, Irvine
B.S. in Biology, School of Biological Sciences
B.A. in Psychology, School of Social Sciences

Teaching Experiences:

2000 – 2008
Assist **Clinical Professor** of Ophthalmology
UCI Department of Ophthalmology

1998 – 1999
Clinical Instructor (Department of Ophthalmology)
Harvard University, Massachusetts Eye and Ear Infarmary

1997 – 1998
Chief Resident (Department of Ophthalmology)
The Eye Institute
Medical College of Wisconsin

1985 – 1987
Instructor and Organizer (Summer prep for General Chemistry, Organic Chemistry and Physics)
University of California, Irvine

Honors and Awards:

1997 – 1998
Chief Resident, Department of Ophthalmology, The Eye Institute, Medical College of Wisconsin

1993
Veterans Administration (Long Beach) **Research Stipend**

1992
Letters of Commendation for multiple clinical rotation, UCI Medical Center

1986
Scholl of Biological Sciences **Service Award** (awarded by nomination to 3 students per year out of a total of over 4,000)

1985 – 1986
President Alpha Epsilon Delta National Premed Honor Society (Irvine Chapter)

1984 – 1987
Dean's Honor List at University of California, Irvine

1985
University of California, **President Undergraduate Research Fellowship Award**

1984
Excellence in Research Award, School of Biological Sciences, university of California, Irvine

Memberships:

1995 – Present
Fellow, **American Academy of Ophthalmology**

1999 – Present
Member, **California Academy of Ophthalmology**

1999 – Present
Member, **Ophthalmology Society**

1990 – Present
Member, **Association for Research in Vision & Ophthalmology**

1986 – Present
Past President and Member, **Alpha Epsilon Delta National Medical Honor Society**

Foreign Language:

Fluent Farsi
Intermediate Spanish

Leadership & Extracurricular: Experiences:

2013 – Present
Managing Board Member, Pacific Private Practice Network (P3N)

1997 – 1998
Chief Resident, The Eye Institute, Medical College of Wisconsin

1991 – 1993
Calexico Program (USC Ophthalmology Dept.)
I have participated in several trips to Calexico with the residents from Doheny Eye Institute/USC Department of Ophthalmology providing eye care to the indigent population that come to Calexico.

1989 – 1993
Scientific Assembly Committee, Student Representative to the California Medical Association
I organized the 1991, 1992, & 1993 California Medical Association's sponsored program on "Residency Selection & Career Planning" for medical students

1989 – 1993
Scientific Advisory Panel on Ophthalmology
California Medical Association Student Representative

1990 – 1991
Student Liaison to the Orange County Medical Association

1989 – 1990
Secretary of the Associated Medical Students
University of California, Irvine

1989 – 1990
Interviewing Committee for medical school applicants

1985 – 1986
President Alpha Epsilson Delta National Premed Honor Society
University of California, Irvine

Research Projects and Advisors:

1999 – 2000
Frederick A. Jakobiec, M.D.
Professor and Chairman
Harvard University, Mass Eye and Ear Infirmary
Department of Ophthalmology
Boston, MA
Research Project: **Orbital Oncology**

1998 – 2000
Peter A.D. Rubin, M.D.
Assistant Professor
Harvard University, Mass Eye and Ear Infirmary
Department of Ophthalmology
Boston, MA
Research Project: **Several projects in the area of oculoplastics. See publication list below**

1998 – 1999
Francis C. Sutula, M.D.
Clinical Professor of Ophthalmology
Harvard University, Mass Eye and Ear Infirmary
Department of Ophthalmology
Boston, MA
Research Project: **Several projects in the area of oculoplastics. See publication list below.**

1998 – 1999
John Woog, M.D.
Professor of Ophthalmology
Tufts University, New England Medical Center
Department of Ophthalmology
Boston, MA
Research Project: **Muir-Torre Syndrome**

1998 – 1999
Daniel Townsend, M.D.
Clinical Professor of Ophthalmology
Harvard University, Mass Eye and Ear Infirmary
Department of Ophthalmology
Boston, MA
Research Project: **Several projects in the areas of oculoplastics. See publication list below.**

1996 – 1998
Gerald J. Harris, M.D.
Professor of Ophthalmology
Chief of Oculoplastic and Orbital Disease
Department of Ophthalmology
Medical College of Wisconsin
Milwaukee, WI
Research Project: **Late Onset Chemosis in Association with Head and Neck Tumors.**

1996 – 1998
Robert A. Hyndiuk, M.D.
Professor of Ophthalmology
Medical College of Wisconsin
Milwaukee, WI
Research Project: **Sporotrichosis**

1996 – 1998
William F. Mieler, M.D.
Professor of Ophthalmology
Chief of Vitreoretinal Surgery
Medical College of Wisconsin
Milwauke, Wi
Research Project: **Vitrectomy for Vitreous Hemorrhage in Association with Uvea Melanoma.**

1996 – 1997
Jose S. Pulido, M.D., M.S.
Professor of Ophthalmology
Medical College of Wisconsin
Milwaukee, WI
Research Project:

I) **Diffuse Disseminated Atheroembolism**
II) **Retinal Arterial Occlusion and Factor V (Leiden Gene) Mutation**

1993
Peter J. McDonnell, M.D.
Professor of Ophthalmology, Department of Ophthalmology
University of Southern California/ Doheny Eye Institute
Research Project:

I) **Comparison of a 4mm incision and a 2mm incision in Radial Kertotomy by studying the post operative ocular rupture with increasing intraocular pressure.**
II) **Management of severe infectious corneal ulcers.**

1993
Ronald Gaster, M.D.
Associate Professor, Department of Ophthalmology
University of California, Irvine
Research Project: **Postkeratoplasty Astigmatism with Double Running Opposing Suture Technique in 96 patients.**

1993
Alan Elias, M.D.
Professor of Endocrinology and Metabolism, Department of Medicine
University of California, Irvine
Research Project: **Premature Ovarian Failure**

1990 – 1991
Roy Steinberg, M.D., Ph.D.
Professor and Vice Chairman of Ophthalmology
Professor of Physiology and Neuroscience
Departments of Physiology and Ophthalmology
University of California, San Francisco
Research Projects: **Neurophysiology of the neural retna and retinal pigment epithelium. I learned microsurgical technique on chick and rat retina –RPE-choroid. I learned the electrophysiologic set-up, design, and use on the chick eye. I also developed the rat retina-RPE-choroid tissue for in-vitro studies.**

1983 – 1986
Monte S. Buchsbaum, M.D.
Professor of Psychiatry & Human Behavior, Department of Psychiatry
University of California, Irvine
Research Project: **A comparison of visual evoked potentials in a group of normal subjects. A second study of the memory and EEG effects of Tranxene in anxiety patients. A third study I was involved in was the specific brain regional effects of Tranxene as assessed by Positron Emission Tomography (PET) and electroencephalography.**

Publications:

Tayyanipour, R. and Buchsbaum M.S. A comparison of Visual Evoked Potentials and Somatoseensory Evoked Potentials in Normal Subjects. Brain Electrical Potentials and Psychopathology (1986, Elsevier Science Publishing Co., Inc.) Pages 329 – 344

Hernandez E.V., Gallemore R.P., **Tayyanipour R.**, Fujii S., and Steinberg R.H. Basal Membrane Cl and K+ Conductances in chick RPE. Journal of Neurophysiology. 1993, 70(4):1656 – 68

Pinheiro N, Bryant MR, **Tayyanipour, R.**, Nassaralla BA, Wee WR, McDonnell, P. Corneal Integrity after Surgery, Effects of Radial Keratotomy and Mini-radial Keratotomy. 1995, Ophthalmology, 102(2), 297 - 301.

Elias, A., Stone, S., **Tayyanipour, R.,** Pandian. Relationship between serum Estradiol concentration and IGF-I, IGF-II and IGF Binding Proteins with Premature Ovarian Failure on Short-Term Estradiol Therapy. International Journal of Fertility and Menopausal Studies. 1995, 40(4): 196 -201.

McLeod, S.,LaBree, LD., **Tayyanipour, R.,** Flowrs, CW., Lee, PP. The Importance of initial management in the treatment of severe infectious corneal ulcers. Ophthalmology 1995, 102 (12):1943 – 8

Tayani, R., Ong, HV, Gaster, R. Visual and Astigmatic Results of a Double Running Opposing Suture Techique for Penetrating Keratoplasty. In preparation.

Tayani, R., Kim, J., Mieler, M. Vitrectomy for Vitreous Hemorrhage Associated with Uveal Melanoma. In preparation

Tayyanipour, R., Pulido, J., Postel, E., Lipkowitz, J., Pisciotta, A., Braza, E. Arteria Vascular Occlusion Associated with Facor V Leiden Gene Mutation. Retina. 1998, 18(4):376 – 7

Pulido, J., Malik, K., **Tayani, R.,** Corbett, J., Walder, W. Retinal Cholesterol Emolism a sign of Diffuse Disseminated Atheroembolism. Submitted to Retina

Tayani, R., Harris, G., Schultz, C., In Woo, K., Cancel, E. Late Onset Chemosis in Patients with Head or Neck Tumors. Submitted for Publication.

Tayani, R., Hyndiuk, RA. Sporotrichosis. Current Ocular Therapy 5th Edition (W.B. Saunders Publishing Co.) In print.

Tayani, R., Rubin, PAD. Postoperative complications of laser surgery in oculoplastics. In preparation.

Tayani, R., Rubin, PAD. Periocular reconstruction, including brow and upper face. In preparation.

Abstracts/Poster Presentations:

Hernandez, E., **Tayyanipour, R.,** Gallemore, R, R., Fugii, S., Steinberg, R. Basal Membrane Cl and K+ Conductances in Chick RPE. Invest Ophthalmol Vis Science (Suppl) 32:832, 1991

Tayyanipour, R., Bryant, MR, Pinheiro, M., Nassaralla, BA, McDonnell, PJ. Ocular Integrity after Refractive Surgery: Effects of Radial Keratotomy and Mini-Radial Keratotomy. Invest Ophthalmol Vis Sci (Suppl) 32:1638, 1994.

McLeod, SD., **Tayyanipour, R.,** Flowers, CW., McDonnell, PJ. Outcomes of In-Hospital Treatment of Corneal Ulcers. Invest Ophthalmol Vis Sci (Suppl) 35:1669, 1996

Tayyanipour, R., Kim, JE, Mieler, WF. Vitrectomy of Vitreous Hemorrhage Associated with Uveal Melanoma. Invest Ophthalmol Vis Sci (Suppl) 37:S620, 1996

McNamara, JA, Postel, EA, Johnson, MV, Pulido, JS, **Tayyanipour, R.** The etiolog of macular detachement associated with optic nerve pits. Invest Ophthalmol Vis Sci (suppl) 37:S428, 1996

Paper Presentations:

Tayyanipour, R., Bryant, MR., Pinheiro, M., Nassaralla, BA, McDonnell, PJ. Ocular Integrity After Refractive Surgery: Effects of Radial Keratotatomy and Mini-Radial Keratotomy. ARVO, Sarasota, Florida, April 1994.

Tayyanipour, R., Ong, HV, Gaster, R. Visual and Astigmatic Results of a Double-Running Opposing Suture technique for Penetrating Keratoplasty. American College Surgeons, Santa Barbara, CA., January 1996 and 2003.

Invited Lectures:

October 24, 2001
UCI Department of Ophthalmology, Grand Rounds Lecture
"Finesse in Ophthalmic Plastic and Reconstructive Surgery"

November 19, 2001
Department of Emergency Medicine, Mission Hospital
"Orbital Trauma and Reconstructive Surgery"

February 18, 2002
Department of Emergency Medicine, Irvine Hospital
"Orbital Trauma and Reconstructive Surgery"

November 4, 2002
Orange County Optometric Society
"Pink Eye Masquarader of Orbital Disease"

May 10, 2003
UCI Department of Ophthalmology, Grand Rounds Lecture
"Comprehensive Ophthalmology and Orbital Trauma"

March 6, 2004
Bristol Park Medical Group, Physicians Round Table
"Ophalmic Plastic and Reconstructive Surgery"

September 15, 2005
Orange County Optometric Society
"Cataract Causes and Treatment"

May 23, 2006
American Academy of Ophthalmology, Orange County Chapter
"Eye and Systemic Diseases"

October 10,2006
Orange County Optometric Society
"Eyelid Lesions and Orbital Trauma"

July 11, 2007
Orange County Optometric Society
"Comprehensive Ophthalmology and Cataract Co-Management"

February 8, 2008
Mission Hospital Continuing Medical Education Series
"Finesse in Ophthalmic Plastic and Reconstructive Surgery"

August 23, 2008
UCI Department of Ophthalmology, Grand Rounds Lecture
"Earlier Detection, Earlier Treatment, Better Outcomes"

April 4, 2009
Bristol Park Medical Group, Physicians Round Table
"Ophalmic Plastic and Reconstructive Surgery"

June 24, 2009
UCI Department of Ophthalmology, Grand Rounds Lecture
"Comprehensive Ophthalmology and Orbital Trauma"

March 25, 2010
American Academy of Ophthalmology, Orange County Chapter
"Pink Eye Masquarader of Orbital Disease"

October 28, 2010
San Clemente Hospital Continuing Medical Education Series
"Eye and Systemic Diseases"

May 20, 2011
Mission Hospital Continuing Medical Education Series
"An Ophthalmologist's Perspective on Findings in Autoimmune System Disorders."

May 24, 2011
Laguna Beach Hospital Continuing Medical Education Series
"An Ophthalmologist's Perspective on Findings in Autoimmune System Disorders."

October 25, 2011
American Academy of Ophthalmology (Orlando, Florida)
"Orbital Lymphoma"

November 5, 2011
Lumenis, Tianjin International Eye Medical Aesthetic Forum (Beijing, China)
"Global Cosmetic Market Overview & Ophthalmological Medical Cosmetology Trend"

CURRICUULUM VITAE

JOHN J MARTINEZ, MD

PERSONAL DATA

Born	June 15, 1958
Marital Status	Married
Medical License	New York: 187664-inactive
	California: G058835
	Pennsylvania: MD-052748-L –Inactive
DEA Number:	BM0690520

EDUCATION

1979-1980 A.B.	Stanford University
1982-1983 M.A	Stanford University
1980-1985 M.D.	Stanford University

BOARD CERTIFICATION

American Board of Dermatology

POST GRADUATE EDUCATION

1985-1988	Resident, Family Medicine PGY 1-3
	University of California, Irvine
1988-1991	Research Fellow, Immunology/Melanoma
	University of California, San Francisco
1991-1994	Resident, Dermatology PGY2-4
	State University of New York at Buffalo
1994-1995	Fellow, Mohs Surgery and Cutaneous Oncology
	University of Pennsylvania

ACADEMIC HONORS

1976	Honors at Entrance, Stanford University
1978	Alpha Gamma Sigma Honor Society
1979	Norman Topping Scholar
1980	Magna cum Laude
	California State Scholarship Recipient

PROFESSIONAL EMPLOYMENT

2004-Present	Partner SCPMG/Kaiser Permanente, Chief of Dermatology Orange County
	Coordinating Chief for Mohs Surgery, Southern California Region
1998-2004	Private Practice; Mohs Surgery West Seneca, New York
1995-1998	Acting Chief of Dermatologic Surgery and Cutaneous Oncology
	Roswell Park Cancer Institute/ University at Buffalo

HOSPITAL AFFILIATIONS

2004-Present	Kaiser Foundation Hospital Anaheim and Los Angeles Medical Center
1997-2001	Mercy Hospital of Buffalo. Chief of Division of Dermatology
1995-2003	Buffalo General Hospital. Attending Physician in Dermatology
1995-2003	United Memorial Medical center. Batavia, New York. Courtesy Staff

Memberships

Fellow of the American Academy of Dermatology

American College of Mohs Micrographic Surgery and Cutaneous Oncology

American Academy of Facial Plastic and Reconstructive Surgery

Pennsylvania Academy of Dermatology

Erie County Medical Society

Buffalo-Rochester Dermatology Society

Teaching Experience

2007-Present	Clinical Associate Professor of Dermatology
	University of California, Irvine
2008-Present	Fellowship Director of the Procedural Dermatology/Mohs Fellowship
	University of California, Irvine/Kaiser Permanente
1995-1998	Assistant Professor of Dermatology
	University of Buffalo/ State University of New York
1998-2003	Clinical Assistant Professor of Dermatology
	University of Buffalo/ State University of New York

SPECIAL CLINICAL EXPERIENCE IN DERMATOLOGY

1989-1991	Fellow – Pigmented Skin Lesion Clinic
	Children's Hospital of San Francisco

RESEARCH EXPERIENCE

1979-1980 Research Assistant, Department of Biological Sciences

Stanford University

Supervisor: Dr. B Abbott, MD PHD.

Subject: Special Tissue Histiochemistry in Exfoliative Cytology.

1988 Research Assistant, Department of Dermatology

University of California Irvine Medical center

Supervisor: Ronald J Barr, MD

Subject: The Viability of Human Skin Xenografts Prolonged by Cyclosporine A.

1989 Clinical Research Fellow, Melanoma Center

University of California at San Francisco

Supervisor: Lynn Spitler, MD

PUBLICATIONS and PRESENTATIONS

Martinez, J, Miller, L., Allen, R., Spitler, L.: "A Randomized Trial of Isoprinosine as Surgical Adjuvant Therapy for Melanoma: Final Report"

Children' Hospital of San Francisco and the University of California at San Francisco

Department of Immunology and surgical oncology.

Abstract to American Society of Clinical Oncology, Washington, DC

Martinez, J., Benedetto, A., Hughes, S. "Schneiderian Papilloma Treated by Mohs Surgery"

Presented at the Pennsylvania Academy of dermatology, May 1995.

Martinez, J., Benedetto, A., "Mohs Micrographic Surgery for Vulvar Carcinoma. Case Report and Review of the Literature." Presented at the May, American College of Mohs Micrographic Surgery and Cutaneous Oncology Meeting May, 1995

"Mohs Micrographic Surgery for Non Melanoma Skin Cancer" Presented at the Kaiser Permanente Southern California Dermatology Symposium. Long Beach California, May 2005.

"Management of Actinic keratoses in a Managed care Population" Presented at the Dermatology Symposium, Kaiser Permanente. Long Beach, California. May 2007

"Population Management of Actinic Keratoses; Outcome and Economic Evaluation" Presented at the Skin Disease Education Foundation, Dermatology Seminar. Maui, HI. February, 2009

"Photodynamic Therapy, Broad-field Long term Incubation Therapy for the management of Actinic Keratoses" Presented at the American Academy of Dermatology Meeting. San Francisco, CA. March, 2010.

"Teledermatolgy: Real time Teledermatolgy Practice between Kern County and Orange County, California". Presented at the Kaiser Permanente National Innovations and Technology Convention. Costa Mesa, CA. June, 2013.

CALIFORNIA STATE BOARD OF OPTOMETRY

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2450 DEL PASO ROAD, SUITE 105, SACRAMENTO, CA 95834
P (916) 575-7170 F (916) 575-7292 www.optometry.ca.gov

Continuing Education Course Approval Checklist

Title: Taste of the Islands
Provider Name: Gina Valdemar (Coastal Vision Medical Group)

☒Completed Application
- Open to all optometrists? ☒Yes ☐No
- Maintain record agreement? ☒Yes ☐No

☐Detailed Course Description
☒PowerPoint and/or other presentation materials
☒Advertising (optional)
☒CV for EACH course instructor
☒License Verification for each course instructor
- Disciplinary History? ☐Yes ☒No

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OPTOMETRY

2016 APR 12 AM 11:39

CONTINUING EDUCATION COURSE APPROVAL APPLICATION

Cashiering and Board Use Only

Receipt #	Payor ID	Beneficiary ID	Amount
1-7130	5413071	6242490	50

$50 Mandatory

Pursuant to California Code of Regulations (CCR) § 1536, the Board will approve continuing education (CE) courses after receiving the applicable fee, the requested information below and it has been determined that the course meets criteria specified in CCR § 1536(g).

In addition to the information requested below, please attach a copy of the course schedule and topical outline of the subject matter. Applications must be submitted 45 days prior to the course presentation date.

Please type or print clearly.

Course Title	Course Presentation Date
Taste of The Islands	04/17/2016

Course Provider Contact Information

Provider Name (contact) "Coastal Vision Medical Group"

Gina (First) Valdemar (Last) _____ (Middle)

Provider Mailing Address

Street 293 S. Main St Ste. 100 City Orange State CA Zip 92868

Provider Email Address ginavaldemar@coastal-vision.com

Will the proposed course be open to all California licensed optometrists?	☒ YES ☐ NO
Do you agree to maintain and furnish to the Board and/or attending licensee such records of course content and attendance as the Board requires, for a period of at least three years from the date of course presentation?	☒ YES ☐ NO

Course Instructor Information

Please provide the information below and attach the curriculum vitae for each instructor or lecturer involved in the course. If there are more instructors in the course, please provide the requested information on a separate sheet of paper.

Instructor Name

Dan (First) Tran (Last) B (Middle)

License Number G-083738	License Type MD
Phone Number (714) 771-1213	Email Address dantran@coastal-vision.com

I declare under penalty of perjury under the laws of the State of California that all the information submitted on this form and on any accompanying attachments submitted is true and correct.

Signature of Course Provider _____ *Date* 4/7/16

Form CE-01, Rev. 2/16

May 3, 2016

State Board of Optometry

2450 Del Paso Road, Ste. 105

Sacramento, CA 95834

RE: Deficiency letter-Late submission of CE course approval

Dear Practice and Education committee,

Coastal Vision Medical Group is dedicated to quality patient care with the latest technology and advanced surgical techniques. Our practice is comprised of several Ophthalmologists that work with local optometric and ophthalmology offices. We use a co-management model that involves sharing in patient care with their eye care providers. Our surgeons work full time and we try to provide quality continuing education for the optometric community year- round while dedicating many hours towards their presentations.

Many of the lectures sometimes evolve as a result of new technology, fulfilling the needs of the community and co-management education. While trying to provide quality education, sometimes complying with guidelines in regards to timely submission is sometimes difficult depending on the changing climate of education we are trying to provide, such as new technology changes or FDA approvals.

In regards to the "Taste of the Islands" CE, we offered a large program with several lectures and speakers for a 7 hour CE program. While it was challenging trying to coordinate such an event, we respect the time of the board and education committee and are committed to trying to get education approval to you in a timely manner. We ask for your lenience in our late submission with our goal of working more diligently to comply with the board's submission guidelines.

We hope this letter helps clarify our position and look forward to continued relations with the State Board of Optometry in regards to continuing education for the optometric community.

Sincerely,

Gina Valdemar, Affiliate Relations and Education Director

Coastal Vision Medical Group

Course Title: Taste of the Island CE

Course Presentation date: 4/17/16

Speakers: Dan Tran, MD; Timothy You, MD; Lisa Garbutt, MD; Betsy (Baothu) Nguyen, MD; John Hwang, MD; Madhu Agarwal, MD; Golareh Fazilat, MD; David Schanzlin, MD; Sanford Chen, MD; Jeffery Joseph, MD

Target Audience: This lecture is intended for optometrist seeking continuing education

Course description: This 7 hour continuing education program provides education in the areas of Retina, Glaucoma, Ocular Plastics, Ocular Disease, Refractive Surgical options and more will the goal of increasing knowledge and options for the optometric community and their patients (see attachment with individual lecture descriptions).

CE credits: 7 CE units

"Taste of the Islands" individual course descriptions

Course Title: Corneal Inlay Options vs. IOLs for Presbyopia: When to do What and Can they Co-exist

Speaker: Dan Tran, MD

Course Description: Updates in IOL and corneal inlay options to support optometric patient counseling and education in the advancements of new presbyopia treatments.

Course Title: An Extraordinary "Retina" Tale of Great Egret Regret

Speaker: Timothy You, MD

Course Description: A story of a unique patient that was attacked by an "Egret" bird, who developed vision loss after the attack to his eye. The purpose was to educate optometrists on how to treat the retinal detachment with this type of an injury to the eye.

Course Title: Herpes Zoster: The Master Masquerader

Speaker: Lisa Garbutt, MD

To help optometrists better understand Herpes Zoster and it's many phases. Also sharing patient cases to have optometrists better understand treatment options. This will help optometrists explain to patients an in depth description of Herpes Zoster and what to expect.

Course Title: Cataract in the Glaucoma Patient: What IOL Should I use?

Speaker: Betsy Nguyen, MD

To give optometrists insight on what IOL is used on patients based on glaucoma status and on the patient's lifestyle needs. Also showing case presentations of patients attendees with audience participation on possible suggested treatment. This gives optometrists a better idea of what IOL's they can discuss with their patients.

Course Title: Macular Degeneration

Speaker: John Hwang, MD

Help educate optometrists on what is AMD, risk factors, symptoms, types of AMD, diagnosis, and treatment, in order to help optometrists recognize this in their patients. This will help optometrists counsel patients on what AMD is and how it can be treated.

Couse Title: Orbital Lumps and Bumps

Speaker: Madhu Agarwal, MD

Educate optometrists on neuro-opthalmology, ocular plastics, and strabismus. It gives optometrists a more in depth view of these three topics in particular so they can have more knowledge on how these types of patients can be treated.

Course Title: Duane Syndrome

Speaker: Golareh Fazilat, MD

To give a better understanding to optometrists on the general characteristics of Duane Syndrome, how to diagnose it, management, and treatment. This will help optometrists recognize it in their patients and be more knowledgeable about how to handle these types of patients.

Course Title: Refractive Surgery Advances: Contura Vision (topography guided) Lasik vs. SMILE

Speakers: David Schanzlin, MD & Dan Tran, MD

Updates on new advanced technology with Contura Vision(topography guided) Lasik and the new SMILE procedure to help educate optometrists on how to discuss these new procedures when talking to possible patients that are candidates. Also, to show optometrists what patient best fits either of these two different procedures.

Course Title: OCT & Macular Disease: Mastering the Basics

Speaker: Sanford Chen, MD

To help optometrists increase their ability to identify retinal pathology on OCT with their patients and also to educate them on OCT interpretations.

Course Title: Challenging Refractive Surgery Cases: How to Manage Patients Outcomes with Advanced Technologies

Speaker: Dan Tran, MD

Give optometrists an overview of how challenging refractive cases are managed using new advanced technology. This allows the optometrist to be more knowledgeable and aware on advanced technology as well as become familiar with how certain refractive surgery cases are handled. Therefore, giving optometrists, more knowledge under their belt when speaking to their own patients.

Course Title: Cataract Surgery: To Femto or Not to Femto

Speaker: Lisa Garbutt, MD

Educate optometrists on the goals, benefits, and advantages of the Femtosecond lasers as well as give an overview of the different types of femtosecond lasers in the market. This allows the optometrist to have more information available to them when speaking to patients about laser guided cataract surgery and know the different options we have to offer.

Course Title: Eyelid and Periocular Cancer: The Optometric Role in Diagnosis and Management

Speaker: Jeffrey Joseph, MD

To educate optometrists on how to diagnose and manage eyelid and periocular cancer and recognize the symptoms in their patients.

Course Title: What I Always wanted to ask the Glaucoma specialist

Speaker: Betsy Nguyen, MD

Educate optometrists on the medical treatment of glaucoma, future glaucoma medications, and knowing when to start glaucoma treatment in patients. Also the case presentations help the optometrist become more aware of what type of medication needs to be administered to their patients.

Total CE units: 7 hours

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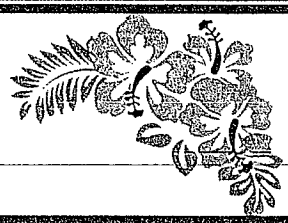

3rd Annual Taste of the Islands CE
April 17, 2016

When
Sunday, April 17, 2016
7:00am – 3:30pm

Where
The Westin South Coast Plaza
686 Anton Boulevard
Costa Mesa, CA 92626
In the Grand Ballroom

Self Parking: $10

Contact:
Gina Valdemar
Director
Affiliate Relations & Education
GinaValdemar@coastal-vision.com
714.746.9679

Join Coastal Vision for this 7-hour CE event and enjoy a day of learning, fun, and socializing. We'll have informative speakers, a delicious lunch, and you might get a chance to brush up on your hula skills. So dig out your puka shells and join us April 17th.

Register before April 1st and receive $30 off the regular price.
Early Bird Registration - $95 until April 1st
Registration Fee - $125 after April 1st

For registration information please visit our new Affiliate Portal:
coastalvisionmedical.com/site/ces.htm
Username: CVAFFILIATE
Password: 293Main

Schedule of Events:

7:00 am-7:50 am	Registration & Breakfast	
7:50 am-8:00 am	Welcome-Opening Remarks	
8:00 am-8:25 am	Dan Tran, MD	Corneal Inlay Options vs. IOLs for Presbyopia: When To Do What and Can They Co-exist?
8:25 am-8:50 am	Timothy You, MD	An Extraordinary "Retina" Tale of Great Egret Regret
8:55 am-9:20 am	Lisa Garbutt, MD	Herpes Zoster: The Master Masquerader
9:20 am-9:45 am	Betsy Nguyen, MD	Cataract in the Glaucoma Patient: What IOL Should I Use?
9:45 am-10:10 am	John Hwang, MD	Macular Degeneration
10:10 am-10:35 am	Madhu Agarwal, MD	Orbital Lumps and Bumps
10:35 am-11:00 am	Break	
11:00 am-11:25 am	Golareh Fazilat, MD	Duane Syndrome
11:25 am-12:15 pm	David Schanzlin, MD & Dan Tran, MD	Refractive Surgery Advances: Contura Vision (topography guided) LASIK vs. SMILE
12:15 pm-1:15 pm	Lunch/Luau	
1:20 pm-1:45 pm	Sanford Chen, MD	OCT & Macular Disease: Mastering the Basics
1:45 pm-2:10 pm	Dan Tran, MD	Challenging Refractive Surgery Cases: How to Manage Patients Outcomes with Advanced Technologies
2:10 pm-2:35 pm	Lisa Garbutt, MD	Cataract Surgery: To Femto or Not To Femto
2:35 pm-3:00 pm	Jeffrey Joseph, MD	Eyelid and Periocular Cancer: The Optometric Role in Diagnosis and Management
3:00 pm-3:25 pm	Betsy Nguyen, MD	What I always wanted to ask the Glaucoma Specialist
3:25 pm-3:30 pm	Closing Remarks/Raffle	

*At time of print, pending CA Board of Optometry approval. Topics and speakers are subject to change.

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Dan B. Tran, MD

Medical Director
Cornea, LASIK & Cataract Surgery Specialist

With the mind of a trained engineer and the intuitive skills of an experienced surgeon, Dr. Dan B. Tran is internationally recognized as a leading expert in advanced vision correction.

The all-laser, bladeless LASIK technique, now considered the standard in care, was first introduced by Dr. Tran to LASIK centers in Orange County when it received FDA clearance in 2001. Dr. Tran is also the first surgeon in the world to combine IntraLaseTMfemtosecond laser technology with intracorneal rings (Intacs™) to treat keratoconus, a vision loss disorder affecting young adults.

In 2011, Dr. Tran was the first surgeon in California to utilize advanced LenSx™ femtosecond technology to perform refractive cataract surgery. This technology is now used in hundreds of cataract centers around the world by highly prominent cataract surgeons. He is among a select few surgeons currently conducting multiple FDA clinical studies on new advanced ophthalmic surgical implant devices.

His combination of surgical finesse and deep understanding of technology are why eye doctors and eye industry executives alike trust Dr. Tran as their personal surgeon. These traits have helped propel the advancement of surgical eye care in Orange County, keeping it at the forefront of surgical eye care delivery worldwide.

Featured several times in the Orange County Register, a member of medical advisory boards for several medical device companies, often invited to conduct FDA clinical trials, and published many times in national ophthalmological publications, Dr. Dan B. Tran is a frequent speaker at national and international meetings throughout the world.

EDUCATION

1984 BS, Electrical Engineering, Magna Cum Laude, California State Polytechnic University, Pomona, CA

1985 Graduate Studies in Electrical & Biomedical Engineering, Stanford University, Palo Alto, CA

1987 Graduate Studies in Electrical & Biomedical Engineering, University of Arizona, Tucson, AZ

1993 MD, University of Southern California, Keck School of Medicine, Los Angeles, CA

PROFESSIONAL TRAINING

1994 Internship, Internal Medicine, St. Mary Medical Center, UCLA School of Medicine, Los Angeles, CA

1997 Resident in Ophthalmology, Scheie Eye Institute, University of Pennsylvania, Philadelphia, PA

FELLOWSHIPS

1998 Fellow in Cornea and Refractive Surgery, Shiley Eye Center, University of California, San Diego, CA

BOARD CERTIFICATION

1999 American Academy of Ophthalmology

PROFESSIONAL AFFILIATIONS

- American Society of Cataract & Refractive Surgery
- International Society of Refractive Surgery
- American Academy of Ophthalmology

UNIVERSITY & HOSPITAL POSITIONS

- Clinical Instructor, Shiley Eye Center, University of California, San Diego, CA
- Staff Ophthalmologist, St. Joseph Hospital of Orange, CA
- Staff Ophthalmologist, St. Mary Hospital, Long Beach, CA

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Lisa D. Garbutt, MD

Comprehensive Ophthalmology
Cornea, Anterior Segment and Eyelid Surgeries

Board certified ophthalmologist Lisa Garbutt, MD, joined Coastal Vision in 2014. As a fellowship trained surgeon, she specializes in cataract surgery, corneal transplants, refractive procedures, such as LASIK, and certain oculoplastic procedures to improve vision such as blepharoplasty and ptosis repair. She is also extensively trained in DSAEK, a breakthrough technique for treating corneal diseases.

In addition to treating medical and surgical diseases of the eye, Dr. Garbutt enjoys being involved in various FDA trials conducted at Coastal Vision. She completed her medical degree cum laude at Boston University School of Medicine and received her ophthalmology training at the University of California, San Diego School of Medicine Shiley Eye Institute. She is a member of the American Academy of Ophthalmology and the American Society of Cataract and Refractive Surgeons.

She also participates in research and FDA clinical trials at Coastal Vision.

"One of the main reasons I became an ophthalmologist is because it gives me the opportunity to make a significant difference in someone's life. We often take our sight for granted, and don't realize how important it is to our everyday functioning, enjoyment, and happiness until it is compromised."

"I enjoy introducing the science and innovation of ophthalmology into my patients' lives. The advancements in this field are moving swiftly forward each year, and allow me to provide the best care possible. Most importantly, I have the utmost respect for the trust of a patient, and aim to use my training, experience, and skill to enhance their quality of life."

Dr. Garbutt is well respected and well liked by her patients, as well as her peers, for her compassion with patient care, her meticulous surgical skills and her comprehensive approach to ophthalmology. She has successfully performed thousands of cataract and cornea surgical cases prior to joining Coastal Vision.

Happy to return home to Orange County, where she grew up, Dr. Garbutt enjoys running, skiing and spending time with her friends and family.

EDUCATION

1994 Bachelor of Science, Psychobiology, University of California, Los Angeles, CA

1999 Master of Arts, Medical Science, Boston University School of Medicine, Boston, MA

2003 Doctor of Medicine, Boston University School of Medicine, Boston, MA

PROFESSIONAL TRAINING

2004-2007 Ophthalmology Residency, Shiley Eye Center, University of California, San Diego, CA

2003-2004 General Surgery Internship, Department of General Surgery, University of California, San Diego, CA

FELLOWSHIPS

2008 Fellow in Cornea, Cataract, and Refractive Surgery, Shiley Eye Center, University of California, San Diego, CA

BOARD CERTIFICATION

2008 American Academy of Ophthalmology

PROFESSIONAL AFFILIATIONS

- American Academy of Ophthalmology
- American Society of Cataract and Refractive Surgery

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Betsy Nguyen, MD

Glaucoma & Cataract Specialist

Dr. Betsy Nguyen is a board certified cataract & glaucoma specialist, with 14 years of experience in her field. Trained at the prestigious, internationally recognized Jules Stein Eye Institute, at UCLA, Dr. Nguyen then became active in glaucoma research with the USC Doheny Eye Institute.

After earning her medical degree with highest distinction at the top of her class from UCLA School of Medicine, Dr. Nguyen went on to UCSF for her fellowship in glaucoma. As a diplomate of the American Academy of Ophthalmology and the California Academy of Eye Physicians & Surgeons, she was one of the team eye doctors for both the LA Angels and the Anaheim Ducks.

Dr. Betsy Nguyen is an ardent researcher, to further treatment options available for all, and has extensive expertise in managing glaucoma and cataracts together. These commonly concomitant conditions are best treated together—treating one and ignoring the other will result in long-term problems for patients. Dr. Nguyen uses the most advanced technologies available to combine the treatment in an integrated fashion, offering patients with cataract and glaucoma the very latest in surgery and research.

Customizing care to every one of her patients, Dr. Nguyen remains passionate about what she does and spends quality time counseling each one. "I give every patient the same level of attention and surgical excellence as I would give my own family."

EDUCATION

1991 Bachelor of Science, Biological Sciences, University of California, Irvine, CA

1995 Doctor of Medicine, David Geffen School of Medicine, University of California, Los Angeles, CA

PROFESSIONAL TRAINING

1995-1996 Internship, Preliminary Medicine, University of California, San Fernando Valley, CA

1996-1999 Residency, Ophthalmology, Jules Stein Eye Institute, University of California, Los Angeles, CA

FELLOWSHIPS

1999-2000 Clinical Fellowship, Glaucoma and Clinical Instructor; University of California, San Francisco, CA and California Pacific Medical Center

BOARD CERTIFICATION

1997 Medical Board of California

2000 American Academy of Ophthalmology

PROFESSIONAL AFFILIATIONS

American Academy of Ophthalmology

American Society of Cataract and Refractive Surgery

American Medical Association

California Medical Association

California Academy of Eye Physicians & Surgeons

Memorial Physician Society

Orange County Ophthalmology Society

Orange County Glaucoma Society

RESEARCH, EXPERIENCE, PRESENTATIONS & PUBLICATIONS

2013 Researcher for USC – Collaboration with Chinese American Eye Study (CHES). Collaborate with Rohit Varma, MD.

2012 Baseline risk factors that predict the development of open-angle glaucoma in a population: The Los Angeles Latino Eye Study. Ophthalmology. 2012 Nov;19(11):2245-53.

2012 Four-year incidence of open-angle glaucoma and ocular hypertension: The Los Angeles Latino Eye Study. Am J Ophthalmol. 2012 Aug;154(2):315-325.

2011 "Population and High Risk Group Screening for Glaucoma: The Los Angeles Latino Eye Study", Invest Ophthalmol Vis Sci. 2011 August; 52(9): 6257–6264.

2000-2011 Researcher for USC – Collaboration with Los Angeles Latino Eye Study (LALES). Collaborate with Rohit Varma, MD and Brian Francis, MD.

2005 Screening for Glaucomatous Optic Nerve Damage: The Los Angeles Latino Eye Study. ARVO Abstract. Invest Ophthalmol Vis Sci 2005;46: E-Abstract 2499.

2004 "Prevalence of open-angle glaucoma and ocular hypertension in Latinos: the Los Angeles Latino Eye Study," Ophthalmology, 2004 Aug; 111(8):1439-48.

2003 Prevalence of Open-Angle Glaucoma and Ocular Hypertension in Latinos. The Los Angeles Latino Eye Study (LALES). ARVO Abstract. Invest Ophthalmol Vis Sci 2003;44: E-Abstract 317

2007-2009 Schering study (LOCS III Certified)

2004-2006 TAKEDA study (LOCS III Certified)

2003 Advanced Glaucoma Training DVD, for Allergan

1999-2000 Evaluation of computerized optic discs to determine stability vs. progression of glaucoma, under Robert L. Stamper, MD, Chief of Glaucoma, UCSF.

1998-1999 Retrospective longitudinal study of progression of glaucoma, using multivariate analysis of serial visual fields, stereoscopic disc photographs, and confocal laser imaging, under Joseph Caprioli, MD, Chief of Glaucoma, UCLA Jules Stein Eye Institute.

ARVO paper presentation, "Identification of Glaucoma Progression Through Combined Use of Quantitative Structural and Functional Measures," May 1999.

1995-1997 Development of quantitative methods for evaluation of socket motility of orbital implants, under Robert A. Goldberg, MD, Chief of Oculoplastics, UCLA Jules Stein Eye Institute. Poster presentation, Jules Stein Eye Institute Research and Alumni Day, 1998.

1992-1993 Investigation of traumatic optic neuropathy in a rat model, under Robert A. Goldberg, MD & Kenneth Steinsapir, MD, UCLA School of Medicine. Poster presentation, "Dynamic Changes in Cerebral Glucose Metabolism Following Optic Nerve Trauma," at Neuroscience, 1992.

1989-1991 Investigation of the effects of glycation on the function of the sodium-potassium pump, under Margaret H. Garner, PhD, UCI School of Medicine. Publication, "Na,K-ATPase of Cultured Bovine Lens Epithelial Cells: H2O2 Effects," Experimental Eye Research, 1992 Mar, 54 (3): 321-7. Poster presentation, "Glucose Control, by Nonenzymatic Glycation of Na, K-ATPase Function in the Nondiabetic," FASEB 1991.

CURRICULUM VITAE

TIMOTHY T. YOU, M.D.

Fellow, American Academy of Ophthalmology

Mailing/Contact Address:
Orange County Retina Medical Group
1200 North Tustin Avenue, Suite 140
Santa Ana, California 92705
714-972-8432

PROFESSIONAL PRACTICE AFFILIATIONS

Orange County Retina Medical Group
Physician/Surgeon/Partner
Since 3/1/2005

1200 North Tustin Avenue	Suite 140	Santa Ana, CA 92705	714-972-8432
1200 North Tustin Avenue	Suite 100	Santa Ana, CA 92705	714-972-8432
24022 Calle de la Plata	Suite 475	Laguna Hills, CA 92653	949-581-3618
320 Superior Avenue	Suite 160	Newport Beach, CA 92663	949-646-3242
333 W. Bastanchury Road	Suite 200	Fullerton, CA 92835	714-451-0801
31451 Rancho Viejo Road	Suite 101	San Juan Capistrano, CA 92675	949-496-0611

7/2002-2/2005 Rhode Island Eye Institute, Providence, Rhode Island
7/1999-6/2002 Pacific Clear Vision Institute, Eugene, Oregon

EDUCATION AND TRAINING

Vitreo-Retinal Fellowship
Massachusetts Eye and Ear Infirmary
Harvard Medical School, Boston, Massachusetts, 1997-1999
- Thomas Heed Ophthalmic Fellow, 1997-98
- American Ophthalmological Society, Herman Knapp Fellow,1998-99

Research Fellowships
Penn Medical Scholars Anatomic Pathology Fellowship
Department of Pathology & Laboratory Medicine
Hospital of the University of Pennsylvania, 1991-1992

Children's Hospital of Los Angeles
University of Southern California, Doheny Eye Institute
Medical Student Fellowship in Pediatric Ophthalmology, 1989

Residency in Ophthalmology
Massachusetts Eye and Ear Infirmary
Harvard Medical School, Boston, Massachusetts, 1994-1997

Internship in Medicine
VA Medical Center, Sepulveda, California
University of California, Los Angeles, 1993-1994

Medical School
Medical Doctorate
University of Pennsylvania School of Medicine
University of Pennsylvania, Philadelphia, Pennsylvania, 1988-1993

Undergraduate Education
Bachelor of Science in Biology with distinction in major & *cum laude*
Yale College, New Haven, Connecticut, 1984-1988

Lab Assistant, Yale School of Medicine, Department of Microbiology, 1987

PROFESSIONAL POSITIONS

2013-Present	Clinical Rotation Preceptor, Southern California College of Ophthalmology, Fullerton, California
2012-Present	Preceptor and Site Coordinator, Western University Health Sciences, Pomona, California
2012-Present	Chief, Department of Ophthalmology, Children's Hospital of Orange County, Orange, California
2009-Present	Advisor, Clinical Institute , St. Joseph Hospital, Orange, California
2010-2012	Member, Planning Committee, Children's Hospital of Orange County Tower, Orange, California
2006-Present	Expert Witness, Medical Board of California
2005-Present	Medical Reviewer, MES Group
2003-2005	Assistant Clinical Professor in Ophthalmology, Brown Medical School, Providence, Rhode Island
2000-Present	Medical Reviewer, Advanced Medical Group
1997-1999	Assistant Staff, Massachusetts Eye and Ear Infirmary, Harvard Medical School, Boston, Massachusetts

MEDICAL LICENSES

American Board of Ophthalmology, Diplomate, (Board Certified) in 1999
Exam score 95th percentile

American Board of Ophthalmology, Diplomate, (Recertification) in 2009
Maintanence of Certification

Diplomat National Board of Medical Examiners, since 1994

Medical Board of California, since 1993

HOSPITAL AFFILIATIONS

3/1/2005 – Present	Anaheim Regional Medical Center, Anaheim, California
3/1/2005 – Present	Children's Hospital at Mission, Mission Viejo, California
3/1/2005 – Present	Children's Hospital of Orange County, Orange, California
3/1/2005 – Present	Hoag Memorial Hospital Presbyterian, Newport Beach, California
3/1/2005 – Present	St. Joseph Hospital, Orange, California
3/1/2005 – Present	Western Medical Center, Anaheim, California
3/1/2005 – Present	Western Medical Center, Santa Ana, California

HONORS AND AWARDS

2003	Brown Medical School Award for Excellence in Teaching
1999	Fellow of the Year for Massachusetts Eye and Ear for Excellence in Teaching
1999	Fellow Award at Paul Chandler Lecture for Resident Teaching
1997	STORZ Ophthalmic Instrument Design Contest for Modified Phaco-Chopper
1994-1991	Bill Raskob Foundation Award
1993	History of Medicine Prize, *The Stigma of Atomic Bomb Disease*
1992	History of Medicine Prize, *A Short History of Egyptian Military Ophthalmia*
1989	Whanki Essay Contest, *The Perfect Painting,* second place
1988	Summer Research Internship, Taejon Research Institute, South Korea
1985	Jostens' Scholarship
1985	Elks Club Western-Division Scholarship
1985	Soroptomist Club Scholarship
1985	Orange County Medical Association Scholarship
1984-1988	Mission Community Hospital Auxiliary Scholarship
1982-1984	American Academy of Sciences Junior Scientist, University of Southern California/University of California at Irvine

PROFESSIONAL SOCIETY MEMBERSHIPS

American Academy of Ophthalmology, Fellow
American Society of Retina Specialists (The Vitreous Society)
Association for Research in Vision and Ophthalmology
California Association of Eye Physicians and Surgeons
California Medical Association
California Scholarship Federation
Orange County Society of Ophthalmology
Orange County Medical Association
Oregon Medical Association
Society of Heed Fellows
Society of Penn Medical Scholars
Western Retina Study Club

CLINICAL RESEARCH

01. Genetech, Inc., Protocol #FVF2598g (Marina), Phase IIIb, 2003-2005
Sub-Investigator. *A multicenter, randomized, double masked, sham injection-controlled study of the safety and efficacy of rhuFab V2 in subjects with neovascular AMD who have minimally classic or occult lesion*

02. Eyetech Pharmaceuticals, Protocol #EOP1004, Phase II/III, 2005-2005
Sub-Investigator. *A randomized, double-masked, controlled, dose-ranging, multi-center comparative trial, in parallel groups, to establish safety and efficacy of intravitreal injections of EYE001 (anti-VEGF pegylated aptamer) in patients with exudative AMD*

03. Alcon Research, Ltd., Protocol C-01-99, Phase III, 2005-2005
Sub-Investigator. *A multicenter, double-masked, randomized, parallel groups study to demonstrate efficacy and safety of anecortave treatment relative to Visudyne for AMD.*

04. OxiGENE, Inc., Protocol MMD-213, Phase III, 2005-2006
Sub-Investigator. *A multi-center, randomized, double-masked, placebo-controlled, parallel group, evaluation of the safety and efficacy of combretastatin A4 phosphate infusion for treating subfoveal CNV in pathologic myopia.*

05. Diabetic Retinopathy Clinical Research Network(DRCR)/National Eye Institute, Protocol B, 2005-2009
Sub-Investigator. *A randomized trial comparing intravitreal corticosteroids and laser photocoagulation for DME.*

06. Alcon Research, Ltd., Protocol C-02-60 (AART), Phase III, 2005-2009
Sub-Investigator. *Anecortave Acetate Risk Reduction Trial (AART): An evaluation of efficacy and safety of posterior juxtascleral administrations of anecortave acetate for depot suspension (15 mg or 30 mg) versus sham administration in patients (enrolled in study "A" or study "B") at risk for developing sight-threatening CNV due to exudative AMD.*

07. National Eye Institute, SCORE, 2005-2009
Sub-Investigator. *The Standard Care vs. Corticosteroid for Retinal Vein Occlusion (SCORE): Two randomized trials to compare the efficacy and safety of intravitreal injection(s) of triamcinolone acetonide with standard care to treat macular edema: one for CRVO and one for BRVO.*

08. Lilly ICOS LLC, Protocol H6D-MC-LVGO, Phase IV, Collaborative Study, 2005-2006
Sub-Investigator. *A randomized, double-blind, parallel-design, placebo-controlled study to evaluate the effects of 5mg tadalafil (IC351, LY450190) and 50mg sildenafil administered once daily for 6 months on visual function in healthy subjects or subjects with mild erectile dysfunction.*

09. Alcon Research, Ltd., Protocol C0459 (IDEAA), Phase III, 2005-2007
Sub-Investigator. *A trial using anecortave acetate 15mg administered every 3 months versus anecortave acetate 15 mg every 6 months versus anecortave acetate 30 mg administered every 6 with exudative AMD.*

10. Eyetech Pharmaceuticals, Protocol EOP1012, Phase IV, 2005-2007
Sub-Investigator. *A randomized, active-controlled, double-masked, single dummy, multicenter comparative trial, in parallel groups, to compare the safety and efficacy of intravitreous injections of Macugen given every 6 weeks for up to 102 weeks, plus sham PDT, to Macugen plus PDT with Visudyne, in subjects with predominantly classic subfoveal CNV secondary to AMD.*

11. Novartis, Protocol CBPD952E2202 (Veritas), Phase IIIB, 2005-2007
Principal Investigator. *A 24-month randomized, double-masked, sham controlled, multicenter study comparing PDT with verteporfin (Visudyne) plus two different dose regimens of intravitreal triamcinolone acetonide (1 mg and 4 mg) versus Visudyne plus intravitreal pegaptnanib (Macugen) in patients with subfoveal CNV secondary to AMD.*

12. (OSI) Eyetech, Protocol EOP1023 (LEVEL), Phase IV, 2006-2008
Principal Investigator. *An open label, multicenter trial of maintenance intravitreous injections of Macugen (pegaptanib sodium) given every six weeks for 48 weeks in subjects with subfoveal neovascular AMD initially treated with a different modality resulting in maculopathy improvement.*

13. Novartis, Protocol #CBPD952A2308 (Denali), Phase IIIB, 2006-2010
Principal Investigator. *A 24-month randomized, double-masked, controlled, multicenter study assessing safety and efficacy of verteporfin (Visudyne) photodynamic therapy administered in conjunction with ranibizimub (Lucentis) versus ranibizumub (Lucentis) monotherapy in patients with subfoveal CNV secondary to AMD.*

14. Alimera Sciences, Protocol C-01-05-001 (FAME), Phase III, 2006-2011
Sub-Investigator. *Fluocinolone Acetonide in Diabetic Macular Edema (FAME): A randomized, double-masked, parallel group, multicenter, dose-finding comparison of the safety and efficacy of ASI-001A 0.5ug/day and ASI-001B 0.2 ug/day fluocinolone acetonide intravitreal inserts to sham injection in subjects with DME (Medidur®).*

15. Regeneron, Protocol VGFT-OD-0605 (VIEW 1), Phase III, 2006-2011
Sub-Investigator. *CLinical Evaluation of Anti-angiogenesis in the Retina - Intravitreal Trial 3 (CLEAR-IT 3): A randomized, double-masked, active-controlled phase III study of the efficacy, safety, and tolerability of repeated doses of intravitreal VEGF Trap in subjects with neovascular AMD.*

16. Opko, Protocol ACU-301 (COBALT), Phase III, 2007-2009
Sub-Investigator. *COmbining Bevasirinib and Lucentis Therapy (COBALT): A randomized, double-masked, parallel-assignment study of intravitreal bevasirinib sodium, administered every 8 to 12 weeks as maintenance therapy following three injections of Lucentis compared with Lucentis monotherapy every 4 weeks in patients with exudative AMD.*

17. Allergan, Protocol 206207-012, Phase III, 2007-2010
Sub-Investigator. *A 52-week, masked, multicenter, randomized, controlled trial (with up to 13 weeks additional follow-up) to assess the safety and efficacy of 700 ug dexamethasone posterior-segment drug delivery system (DEX PS DDS) Applicator System in combination with laser photocoagulation compared with laser photocoagulation alone in the treatment of subjects with diffuse DME.*

18. Vitreoretinal Technologies, Inc., Protocol PVD-301, Phase III, 2007-2010
Sub-Investigator. *A safety and efficacy study of Vitreosolve for ophthalmic intravitreal injection for inducing posterior vitreous detachment in subjects with NPDR.*

19. Merck & Co., Protocol 007-01 , Collaborative Study, 2008-2009
Ophthalmology Investigator. *A safety follow-up study of patients previously exposed to MK-0634 (a beta-3 receptor antagonist developed for the treatment of overactive bladder). Subjects had previously been enrolled in a multicenter, double-blind, randomized, placebo-controlled, parallel group, dose-ranging study of L-000796568 in postmenopausal women with OAB.*

20. Allergan, Protocol 206207-019-00, Phase II , 2008-2010
Sub-Investigator. *A 26-week, open-label study to assess the safety and efficacy of 700 ug dexamethasone posterior segment drug delivery system applicator system in conjunction with Lucentis® in the treatment of patients CNV secondary to AMD.*

21. Ophthotech Corp., Protocol OPH3000, Phase I, 2008-2010
Sub-Investigator. *An ascending dose and parallel group trial to establish the safety, tolerability and pharmacokinetic profile of multiple intravitreous injections of volociximab ($\alpha 5\beta 1$ integrin antagonist) as monotherapy or in combination with Lucentis 0.5 mg/eye in subjects with neovascular AMD.*

22. Regeneron, Protocol VGFT-OD-0706 (Da Vinci), Phase III, 2008-2011
Sub-Investigator. *A double-masked, randomized, controlled study of the safety, tolerability and biological effect of repeated intravitreal administration of VEGF Trap-eye in patients with DME.*

23. NEI/Tufts Medical Center, The Family Study of Macular Degeneration, 2009-2010
The goal is to evaluate genetic and non-genetic risk factors for AMD

24. Allergan, Protocol 206207-018-00, Phase II, 2008 - 2010
Sub-Investigator. *A 26-week, open-label study to assess the safety and efficacy of 700 ug dexamethasone posterior segment drug delivery system applicator system in the treatment of vitrectomized subjects with DME.*

25. Grunenthal, Protocol KF0151Y/10, Phase IIb, Collaborative Study, 2009-2011
Sub-Investigator. *A randomized, multicenter, double-blind, parallel-group trial to assess the analgesic efficacy and safety of a new analgesic compared with placebo in subjects with painful diabetic peripheral neuropathy.*

26. Endo Pharmaceuticals, Protocol EN3324-201, Phase IIb, Collaborative Study, 2010-2011
Sub-Investigator. *A randomized, multicenter, double-blind, two-arm, multicenter, placebo-controlled study to assess the efficacy and safety of EN3324 (Axomadol) in subjects with moderate to severe chronic low back pain.*

27. GlaxoSmithKline, Protocol MD 7110852, Phase IIB, 2009-2012
Principal Investigator. *A dose-ranging study of pazopanib eye drops vs. ranibizumab intravitreal injections for the treatment of neovascular AMD.*

28. Genentech, Protocol FVF4579g (HARBOR), Phase III, 2009-2012
Sub-Investigator. *A double-masked, multicenter, randomized, active treatment-controlled study of the efficacy and safety of 0.5 mg and 2.0 mg ranibizumab administered monthly or on an as needed basis (PRN) in patients with subfoveal neovascular AMD.*

29. Lux Biosciences, Inc., Protocol LX211-11, Phase III, 2011-2013
Sub-Investigator. *A multicenter, double-masked, parallel group, placebo-controlled study to assess the efficacy and safety of Voclosporin as therapy in subjects with active noninfectious intermediate, posterior or pan-uveitis.*

30. Lpath, Protocol LT1009-Oph-003 (NEXUS), Phase IIA, 2011-Present
Sub-Investigator. *A multicenter, masked, randomized, comparator-controlled study evaluation Isonep™ (sonepcizumab [LT1009]) as either monotherapy or adjunctive therapy to Lucentis or Avastin versus Lucentis or Avastin alone for the treatment of subjects with choroidal neovascularization secondary to AMD.*

31. Alimera, Protocol C-01-11-008, Extension Study, 2011-2013
Sub-Investigator. *An open-label, multicenter, extension study of the safety and utility of the new inserter of Iluvien® (Fluocinolone Acetonide Intravitreal Insert) 0.19mg and the safety of Iluvien® in subjects with DME.*

32. EyeGate Pharmaceuticals, Protocol EGP-437-004, Phase III, 2012-2013
Sub-Investigator. *A prospective, multi-center, randomized, double-masked, positive controlled, clinical trial designed to evaluate the safety and efficacy of iontophoretic dexamethasone phosphate ophthalmic suspension (1%) in patients with non-infectious anterior segment uveitis*

33. Quark Pharmaceuticals, Protocol QRK202 (MATISSE), Phase II, 2012-2013
Sub-Investigator. *An open-label dose escalation study of PF-04523655 (Stratum I) combined with a prospective, randomized, double-masked, multi-center, controlled study (Stratum II) evaluating the efficacy and safety of PF-04523655 alone and in combination with ranibizumab versus ranibizumab alone in diabetic macular edema*

34. Xoma, Protocol X052130/CL3-78989-005, Phase III, 2012-Present
Principal Investigator. *A randomized, double-masked, placebo-controlled study of the safety and efficacy of gevokizumab in the treatement of active non-infectious intermediate, posterior, or pan-uveitis*

35. Pfizer, Protocol B1181003-1050, Phase II, 2012-2013
Sub-Investigator. *A phase 2, multi-center, randomized, double-masked, placebo-controlled, multi-dose study to investigate the efficacy, safety, pharmacokinetics and pharmacodynamics of RN6G (PF-04382923) in subjects with geographic atrophy secondary to age-related macular degeneration*

36. Xoma, Protocol X052131/CL3-78989-005 (EYEGUARD™-C), Phase III, 2012-Present
Principal Investigator. *A randomized, double-masked, placebo-controlled study of the safety and efficacy of gevokizumab in the treatment of subjects with non-infectious intermediate, posterior, or pan- uveitis currently controlled with systemic treatment*

37. Regeneron Protocol VGFTe-AMD-1124 ((RE-VIEW), Phase IV, 2012-Present
Sub-Investigator. *Rigorous evaluation of vision and safety with intravitreal afliberecept injection dosed every 8 weeks over 2 years in neovascular AMD*

38. Merck Protocol MK8931—017 (SCH 900931, P07738), Phase 2/3, Collaborative Study, 2012-Present
Ophthalmology Investigator. *A randomized, placebo controlled, parallel-group, double blind efficacy and safety trial of MK-8931 in subjects with mild to moderate Alzheimer's disease*

39. Ophthotech OPH1003, Phase III, 2013-Present
Sub-Investigator. *A randomized, double-masked, controlled trial to establish the safety and efficacy of intravitreous administration of Fovista™ (Anti-PDGF-B pegylated aptamer) administered in combination with Lucentis® compared to Lucentis® monotherapy in subjects with subfoveal neovascular macular degeneration*

ABSTRACTS

01. Wong CG, **You TT**, Ghosen C, Ton L, You L, Burke J, Wheeler L. *Experimental CNV in Cynomologous Monkey after Sustained Release of VEGF & bFGF within the Suprachoroidal Space.* Association for Research in Vision and Ophthalmology Meeting; May 2011. Abstract

02. Wong CG, **You TT**, Carvalho RAP. Natural history of progressive experimental CNV in the rabbit after sustained release of both VEGF and bFGF within the supra-choroidal space. Association for Research in Vision and Ophthalmology Meeting, May 2009. Abstract

03. Wong CG, Bruice TC, **You TT**. Experimental CNV after transcleral implantation of VEGF/bFGF-implant within the suprachoroidal space for defining potential long-term synergistic actions of ranibizumab (Lucentis) with small low-cost molecules in ameliorating wet AMD. Association for Research in Vision and Ophthalmology Meeting, May 2008. Abstract

04. **You TT**, Wong CG, Fedoruk T, Bonakdar M. Comparison of Lucentis and Avastin in the suprachoridal VEGF/bFGF-implant rabbit CNV model provides a potential standardized pre-clinical approach in the rational development of more effective QSAR-based drugs, sustained release formulations, and drug delivery systems for ameliorating AMD. Association for Research in Vision and Ophthalmology Meeting, 2007. Abstract

05. Gupta G, Donahue JP, Andorsky S, **You TT**. Profile of the retina by optical coherence tomography in the pediatric age group. Association for Research in Vision and Ophthalmology, Ft. Lauderdale, Florida; May 1, 2005. Abstract

06. Gupta G, and **You T**. Vitreous Hemorrhage in age-related macular degeneration. New England Ophthalmological Society, Boston, Massachusetts; May 2004. Abstract

07. **You TT** and Itturiaga J. "The Range of Abnormalities in *Drosophila* 1(1)ts-726 after High Temperature Shock Treatments." California Academy of Science Meeting, Los Angeles, California; 1984. Abstract

08. **You T** and Itturiaga J. "Variations in Bristle Pattern After High Temperature Treatment in *Drosophila melanogaster*." American Academy of Science Meeting, New York, New York; 1984. Abstract

PAPERS AND PUBLICATIONS

01. **You TT**, Youn DW, Chen S, Alexandrescu B, Casiano ME, Maggiano JM. Intraocular penetration by acupuncture needle. (submitted for publication, *Retina*)

02. Ambati J, Gragoudas ES, Miller JW, **You TT**, Miyamoto K, Delori FC, Adamis AP. Transscleral delivery of bioactive protein to the choroid and retina. *Invest Ophthalmol Vis Sci* 2000 Apr; 41(5):1186-91.

03. Arroyo JG, **You TT**, Bossi KE. Illuminated lens fixator for bimanual pars plana lensectomy. *Ophthalmic Surg Lasers* 2001 Sep-Oct;32(5):438-40.

04. Rumeldt S, **You TT**, Remulla HD, Rubin PAD, Jakobiec FA. Prepartum mixed type cavernous-capillary hemangioma arising in nevus flammeus. *Ophthalmology* 1999;106:1219-22.

05. **You TT** and Power W. Choroidal detachments and uveal effusion syndrome. In: *Principles and Praxis of Ophthalmology* Vol. 2. Albert DM & Jacobiec F (eds). Saunders. Philadelphia. 1999;1338-1351.

06. **You TT** and JG. Arroyo. Surgical approaches to managing the dislocated crystalline lens. *Int Ophthalmol Clinics* 1999;39:1-12.

07. **You TT** and Kaiser PK, Netland PA, Jakobiec FA. Neurothekeoma palpebrae: a rare nerve sheath tumor arising in the eyelid. *Ophthal Plast Reconstr Surg*. 1999;6:448-9.

08. **You TT** and Young LHY. Retinal manifestations of gastrointestinal disorders. *Int Ophthalmol Clinics* 1998;38:197-220.

09. **You TT**, et al. Corneal Abrasion Patching Study Group. A study of topical nonsteroidal anti-inflammatory drops and no pressure patching in the treatment of corneal abrasions. *Ophthalmol 1997;* 104: 1353-59.

10. **You, TT** and Pavan-Langston D. Chronic unilateral keratitis in a young man. *Dig J Ophthalmol* 1995 October 25;Vol. 1. Issue 2.

11. **You, TT** and Dohlman CH. Progressive corneal opacification and arthropathy. *Dig J Ophthalmol* 1995 August 12;Vol. 1, Issue 1.

12. **You TT**, Choi JC, Partington MA, Whitaker LA, Shore JW. "Ophthalmic Findings Associated with Unilateral Non-compensational Plagiocephaly." Association for Research in Vision and Ophthalmology, Fort Lauderdale, Florida; 1995. Abstract

13. **You, TT** and Pavan-Langston D. Immune reactions in corneal herpetic disease. *Int Ophthalmol Clinics* 1996;36: 31-39.

14. Menzin AW, **You TT**, Deger RB, J.J. Brooks, S.A. King. Sarcoidosis in a uterine leiomyoma. *Int J Gynaecol Obstet 1995;*48: 79-84.

15. Trojanowski JQ, Mantione JR, Lee JH, Seid DP, **You TT**, Inge LJ, Lee VMY. Neurons derived from a human teratocarcinoma cell line establish molecular and structural polarity following transplantation into the rodent brain. *Exp Neurology* 1993;122: 283-94.

POSTERS & PRESENTATIONS

01. *Updates in Retina Care: Macular Degeneration and Implantable Miniature Telescope*
Course Director. Retina Care Symposium, Costa Mesa, California; December 5, 2013.

02. *Healthcare*
Invited speaker. Third Annual Yorba Linda High School Career Day, Yorba Linda, CA; November 13, 2013.

03. *Updates in Macular Degeneration*
Invited speaker (JCAPHO). South Coast Eye Center, Laguna Hills, California; November 8, 2013.

04. *Cataract Surgery: Retinal Perils, Risks* and Complications.
Invited speaker. NVision Centers, Costa Mesa, California; August 22, 2013.

05. *Retinopathy of Prematurity and Eye Care for Infants*
Invited speaker. Anaheim Regional Medical Center, Anaheim, California; February 21, 2013.

06. *Healthcare*
Invited speaker. Second Annual Yorba Linda High School Career Day, California; November 1, 2012.

07. *Iontopheretic Dexamethasone Phosphate Ophthalmic Suspension in Patients with Non-Infectious Anterior Segment Uveitis: Phase III Data.* Anaheim, California; October 3, 2012.

08. *Updates in Age-Related Macular Degeneration*
Invited speaker. Forest Home Conference Center, Forest Falls, California; July 5, 2012.

09. *Update on Retinal Venocclusive Diseases*
Guest speaker (JCAPHO). South Coast Eye Medical Centers, Laguna Hills, California; March 9, 2012.

10. *Healthcare*
Invited speaker. First Annual Yorba Linda High School Career Day, California; November 8, 2011.

11. *Management of Ophthalmic Emergencies*
Invited speaker. Forest Home Conference Center, Forest Falls, California; July 5, 2011.

12. *Retinal Disease Management*
Invited Speaker, Fuentes de Gracia Hospital Grand Rounds. Chimaltenango, Guatemala; March 2011.

13. *Diabetes and the Eye*
Invited Speaker. St. Joseph's Hospital, Orange, California; February 26, 2011.

14. *Overcoming Retina Hurdles to 20/20 Vision for Your Patients*
Invited Speaker. Orange County Optometric Society, Western Medical Center, California; August 8, 2010

15. *Diabetes and the Eye*
Invited Speaker. St. Joseph's Diabetes Day Conference, St. Joseph Medical Center, Orange, California; February 26, 2010.

16. *Retinopathy of Prematurity and Other Ocular Anomolies*
Invited Speaker. Anaheim Regional Medical Center, Anaheim, California; October 27, 2009.

17. Co-Moderator, Day of Ophthalmology. St. Joseph's Hospital, Orange, California; October 3, 2009.

18. *Retinopathy of Prematurity and Neonatal Eye Diseases*
Invited Speaker. Children's Hospital of Orange at Mission Viejo, California; September 28, 2009.

19. *Retinopathy of Prematurity and Neonatal Eye Diseases*
Invited Speaker. Department of Neonatology, Childrens' Hospital of Orange County, California; July 13, 2009.

20. *Updates in Ophthalmic Care*
Invited Speaker, Fuentes de Gracia Hospital Grand Rounds, Chimaltenango, Guatemala; July 2009.

21. *Updates on New Treatment for Retinal Diseases*
Invited Speaker. TLC Annual Symposium, Anaheim, California; June 7, 2009.

22. *Macular Degeneration*
Invited Speaker, Foundation for Fighting Blindness. Low Vision Symposium, Southern California College of Optometry, Fullerton, California; May 9, 2009.

23. *The Refractive Surgery Retinal Evaluation: Pearls and Pitfalls*
Invited Speaker. TLC, Newport Beach, California; April 22, 2009.

24. *Retinal Disease Update*
Invited Speaker. Fuentes de Gracia Hospital Grand Rounds, Chimaltenango, Guatemala. August 8, 2008.

25. *Emerging Treatment Strategies for Exudative AMD.*
Novartis Speaker Program. Costa Mesa, California; March 12, 2008.

26. *Emerging Treatment Strategies for Exudative AMD.*
Novartis Speaker Program. Newport Beach, California; February 20 2008.

27. *Retinopathy of Prematurity and Other Ocular Anomalies*
Invited Speaker. Children's Hospital of Orange at Mission. Mission Viejo, California; February 20, 2007.

28. *Toxoplasma Uveitis*
Invited Speaker, Continuing Medical Education Lecture. Children's Hospital of Orange County, Orange, California; October 23. 2006

29. *Retinopathy of Prematurity*
Invited Speaker. Anaheim Regional Medical Center, Anaheim, California; March 14, 2006.

30. *Retinopathy of Prematurity and Neonatal Eye Diseases*
Invited Speaker. Hoag Presbyterian Hospital, Newport Beach, California; July 12, 2005.

31. *The Great Debates: Controversies in Retinal Disease 2005*
Invited Speaker, Medical Education Seminar. University of California, Irvine, Beckman Laser Center, Irvine, California; March 26, 2005.

32. *Pediatrics Case Conference*
Invited Speaker. Rhode Island Hospital, Providence, Rhode Island; January 20, 2003.

33. *Advances in Retina*
Rhode Island Eye Institute, Providence, Rhode Island; 2002.

34. *Posterior Segment*
Posterior Segment Rounds, Central Oregon Optometric Association, Redmond, Oregon; 2001.

35. *Medicine 2000*
Oregon Society of Medical Assisting Conference, Eugene, Oregon; 2000.

36. *Retinal Diagnoses*
Pacific Northwest Conference, Bend, Oregon; 2000.

37. *Retinal Surgery throughout the Ages*
Lane County Optometric Society Meeting, Eugene, Oregon; 1999.

38. **You TT** and Arroyo JG. Surgical approaches to dislocated lenses. Annual Fellows' Conference, Massachusetts Eye & Ear Infirmary, Boston, Massachusetts; 1998.

39. **You TT** and Young LHY. "Retinal Manifestations of Gastrointestinal Disorders." Biennial Residents' Conference. Massachusetts Eye & Ear Infirmary, Boston, Massachusetts;1997.

40. **You TT**, R.N. Hogan, C.S. Foster, C.H. Dohlman. "Corneal Injury in Stevens-Johnson Syndrome." Contact Lens Association of Ophthalmologists Meeting, Las Vegas, Nevada; 1997. Poster

41. **You TT**, Hogan RN, Yuhan KR, Foster CS, C.H. Dohlman. "A Clinicohistopathologic Study of Cornea in Erythema Multiforme Major." Academy of Ophthalmology Meeting, Chicago, Illinois; 1996. Poster

42. **You TT**, Hogan RN, Foster CS, Dohlman CH. "Keratopathy in Stevens-Johnson Syndrome: Histopathologic Study of Diseased Cornea." Association for Research in Vision and Ophthalmology, Fort Lauderdale, Florida; 1996. Poster

43. **You TT** and Pavan-Langston D. "Sterile Inflammatory Reactions in Herpes Keratitis." Biennial Residents' Day Conference. Massachusetts Eye & Ear Infirmary, Boston, Massachusetts; 1995.

44. Navon S, **You TT**, Chynn EW. "Eye Examination." NPACE Skills Building Seminar, Framingham, Massachusetts; 1995.

45. *Cognitive Decision Making - A Computer Based Model*
Society of General Internal Medicine Meeting, Washington, DC; 1994.

46. **You TT**, Partington MA, Whitaker LA. "Congenital Torticollis and Plagiocephaly: Clinically Frequent Association." 51st American Cleft Palate and Craniofacial Association Conference, Toronto, Canada; 1994.

47. *Bacterial Utilization of Dissolved Organic Matter in a Natural, Oligotrophic Aquatic System*
California Academy of Science Meeting, Los Angeles, California; 1981.

John C. Hwang, M.D., M.B.A.

John Hwang, M.D., M.B.A. received his Doctor of Medicine degree from Columbia University, College of Physicians and Surgeons in New York, NY. In addition to his primary MD degree, he also received a Master of Business Administration from Columbia Business School. Dr. Hwang then completed his medicine internship at Queen's Medical Center in Honolulu, HI. He subsequently completed his residency at the Edward S. Harkness Eye Institute at Columbia University, followed by a combined medical and surgical vitreoretinal fellowship at Doheny Eye Institute at the University of Southern California. Dr. Hwang has authored numerous papers in the peer-reviewed ophthalmic literature with expertise in the treatment of age-related macular degeneration and surgical management of proliferative diabetic retinopathy, retinal detachment, and macular hole. Dr. Hwang sees patients at the Newport Beach, Laguna Hills, and Santa Ana offices.

Dr. Hwang is an adjunct faculty member at the USC Eye Institute and serves as a Clinical Assistant Professor of Ophthalmology.

Credentials

MEDICAL SCHOOL	Columbia University, College of Physicians and Surgeons New York, New York
INTERNSHIP	Queen's Medical Center University of Hawaii; Honolulu, Hawaii
RESIDENCY	Edward S. Harkness Eye Institute Columbia University; New York, New York
FELLOWSHIP	Doheny Eye Institute

Professional Memberships

- American Academy of Ophthalmology
- American Society of Retina Specialists
- American Board of Ophthalmology
- Orange County Society of Ophthalmology

CV Resume

Curriculum Vitae

Madhu R. Agarwal

General Information
Maiden name: Madhu R. Chopra
Birthplace: Los Angeles, California

Board Certification:
American Academy of Ophthalmology

Languages:
Fluent in Spanish and Hindi

Private Practice
California Orbital Consultants, Redlands

Previous Employment
¨ Associate Professor of Ophthalmology, Loma Linda University Department of Ophthalmology
¨ Clinical Instructor in Ophthalmology, Doheny Eye Institute, University of Southern California

Education

Fellowship
¨ Neuro-ophthalmology and Orbital Surgery (Ophthalmic Plastics/Adult Strabismus) Doheny Eye Institute, University of Southern California
Faculty: Alfredo A. Sadun, M.D., Ph.D. and Peter A. Quiros, M.D.
(7/2003-7/2004)

Residency
¨ Ophthalmology, Doheny Eye Institute, University of Southern California (7/2000-6/2003)

Internship
¨ Internal Medicine, University of California, Los Angeles-Olive View Medical Center, (7/1999-6/2000)

Educaction

¨ University of California, Los Angeles School of Medicine (8/1995-5/1999)
– Doctor of Medicine

¨ University of California, Los Angeles (9/1992-6/1995)
Bachelor of Science in Biochemistry
Phi Beta Kappa, Magna cum laude

Professional Activities

¨ Scientific Reviewer, Frontiers in Neuro-Ophthalmology (2010- present)
¨ Co-Chair, NANOS Symposium at the American Academy of Ophthalmology Meeting, San Francisco (2009)
¨ Committee Member, Neuro-ophthalmology Planning Group for the American Academy of Ophthalmology Sub-specialty Meeting (2009-present)
¨ Scientific Reviewer, Eye (2008-9)
¨ Vice-Chair, Patient Education Committee for North American Neuro-Ophthalmology Society (2008-10)
¨ Panel Member/Editor, Practicing Ophthalmologists Committee /Recertification Curriculum in Neuro-ophthalmology for the American Academy of Ophthalmology (2009-2014)
¨ Elected Commissioner, Joint Commission of Allied Health Personnel in Ophthalmology (2007-2012)
¨ Committee Member, North American Neuro-ophthalmology Society Committee to the American Academy of Ophthalmology (2006-present
¨ Committee Member, LLU Residency Selection Committee (2005, 2006, 2007)
¨ Committee Member, LLU School of Medicine Compliance (2005-date)
¨ Co-Director of Quality Assurance, LLU Department of Ophthalmology (2005-date)
¨ Committee Member, LLU Department of Ophthalmology Marketing (2006-date)
¨ Committee Member, LLU Department of Ophthalmology Compensation (2006-2007)
¨ Chair, LLU Department of Ophthalmology Resident Research Day (June 2006)
¨ Scientific Reviewer, Ophthalmology (2005)

Honors

¨ UCLA Medical Alumni Association Award for Distinguished Service
¨ UCLA Obstetrics and Gynecology Stipend for the Advancement of Breast Cancer Research
¨ American Heart Association Student Research Grant/Award
¨ Phi Beta Kappa Honors Society
¨ Golden Key National Honors Society
¨ Alpha Lambda Delta Honors Society
¨ UCLA Faculty Women's Club Scholarship liaison
¨ National Merit Scholarship
¨ UCLA Dean's Honor List All Quarters

Presentations

¨ "Double Trouble: A Look at Breast Cancer Metastases in Your Neighborhood." Doheny Eye Institute. Los Angeles, CA. April 10, 2010.
¨ "Hang in There: Myasthenia Gravis." American Academy of Ophthalmology Meeting, San Francisco, October 24, 2009.
¨ "Ischemic Optic Neuropathies." Inland Empire Optometric Symposium. Ontario, CA. March 15, 2009.
¨ "Taking a History in the Evaluation of Optic Atrophy." Doheny Eye Institute at USC. December 13, 2008.
¨ "Eyelid Skin Cancer." California Optometric Association/Optowest. Monterey, CA. November 16, 2008.

¨ Neuro-ophthalmology Basics." California Optometric Association/Optowest. Monterey, CA. November 15, 2008.
¨ "Understanding MS and Other Neurological Conditions." California Optometric Association/Optowest. Monterey, CA. November 14, 2008.
¨ "Ptosis: Nuances for the Clinician." Joint Commission for Allied Health Professionals in Ophthalmology National Meeting. New Orleans. November 9, 2008.
¨ "Giant Cell Arteritis." Joint Commission for Allied Health Professionals in Ophthalmology National Meeting. New Orleans. November 10, 2008.
¨ "So You Think It's Just Ptosis." Senior Instructor for the American Academy of Ophthalmology Conference. New Orleans, November 10, 2008.
¨ "Thyroid Eye Disease". Department of Ophthalmology Conference for Optometrists. Loma Linda University. November 4, 2008.
¨ Moderator/Speaker. Walsh Meeting at the North American Neuro-ophthalmology Society Meeting. Orlando, FL. March 9, 2008.
¨ Review of Neuro-ophthamology and Oculoplastics." Inland Empire Optometry Society. February 22, 2008.
¨ "Understanding Diplopia." Doheny Eye Institute at USC. December 8, 2007.
¨ "Ocular Malingering". Department of Ophthalmology Conference for Optometrists. Loma Linda University. November 4, 2007.
¨ "Ophthalmology and Multiple Sclerosis: Breakfast with the Experts." American Academy of Ophthalmology Conference. New Orleans. November 12, 2007.
¨ "Thyroid Eye Disease: Nuances for the Clinician." Joint Commission for Allied Health Professionals in Ophthalmology National Meeting. New Orleans. November 9, 2007.
¨ So You Think It's Just Ptosis." Senior Instructor for the American Academy of Ophthalmology Conference. New Orleans. November 11, 2007
¨ "Challenging Syndromes in Neuro-ophthalmology". C and E Optometry Symposium. Anaheim Marriot. October 29, 2007.
¨ "Ophthalmology and Multiple Sclerosis: Breakfast with the Experts." American Academy of Ophthalmology Conference. Las Vegas, Nevada. November 14, 2006.
¨ "Around the World in Neuro-ophthalmology and Oculoplastics." Department of Ophthalmology Conference for Optometrists. Loma Linda University. November 5, 2006.
¨ "Neuro-ophthalmology Basics." Neuro-ophthalmology Symposium. Anaheim Marriot. October 29, 2006.
¨ "Posterior Ischemic Optic Neuropathy." Department of Anesthesiology Grand Rounds. Loma Linda University. October 11, 2006.
¨ "Trigeminal Neuralgia." Doheny Eye Institute's Ophthalmic Pain Symposium. September 9, 2006.
¨ "Thyroid Eye Disease." Department of Medicine Grand Rounds. Loma Linda University. August 6, 2006.
¨ "Oculoplastics for the Beginning Ophthalmology Resident." Department of Ophthalmology Grand Rounds. Loma Linda University. July 20, 2006.
¨ "Neuro-ophthalmology and Oculoplastics." Inland Empire Ophthalmic Technician Meeting. July 12, 2006.
¨ "Cita Con Su Medico." Spanish Radio Show about Ophthalmology. June 25, 2006.
¨ "Eyelid Reconstruction." Department of Dermatology Grand Rounds. Loma Linda University. April 26, 2006.
¨ "Eyelid Cancer." Inland Empire Optometry Symposium. Ontario Marriot. March 26, 2006.
¨ "Painful Clinical Syndromes in Neuro-ophthalmology and Orbital Surgery". Alumni Weekend, APC. Loma Linda University. March 5, 2006.
¨ "Oculoplastics." Lecture for Loma Linda University Housestaff. Loma Linda. February 8, 2006
¨ "Neuro-ophthalmology Update." "Neurosurgery Update." Department of Neurosurgery. Loma Linda University. February 15, 2006.
¨ "Oculoplastics for the Plastic Surgeon." Department of Plastic Surgery Grand Rounds. Loma Linda University. February 8, 2006.

" "Understanding Blepharospasm." Dystonia Support Group of the Inland Empire. Loma Linda University. February 2, 2006.

" "Hook, Line, and Sinker: Surprising Outcomes in Neuro-ophthalmology and Orbital Surgery." Inland Empire Optometric Society. Ontario, CA. January 11, 2006.

" "Neuro-ophthalmology and Orbital Surgery." Department of Family Medicine Grand Rounds. Loma Linda University. December 9, 2006.

" "The Double Whammy." Department of Ophthalmology Conference for Optometrists. Loma Linda University. November 6, 2005.

" "Comprehensive Review of Ophthalmology." Loma Linda University School of Medicine. October 28, 2005.

" "Neuro-ophthalmology and Orbital Disease." Department of Neurology Grand Rounds. Loma Linda University School of Medicine. October 26, 2005.

" Cranial Nerve Palsies." Women in Optometry. Riverside, CA. September 21, 2005.

" "The Wild World of Disc Edema." Inland Empire Optometric Society. Ontario, CA March 20, 2005.

" "Clinicopathology of Tumors of the Ccular Adnexa." Annual Postgraduate Conference. Loma Linda University Medical Center. March 6, 2005.

" "Painful Clinical Syndromes in Neuro-ophthalmology and Orbital Disease." Pain Management Symposium. Doheny Eye Institute. February 12, 2005.

" "Benign intracranial hypertension: Is it really benign?" Women in Optometry. Inland Empire Optometric Society. January 18, 2005.

" "Giant Cell Arteritis." Conference in Ophthalmology for Optometrists. Loma Linda University. October 31, 2004.

" "Amniotic Membrane Transplantation." Department of Ophthalmology, Resident Research Day. Loma Linda University Medical Center. June 5, 2004.

" "Orbital Pseudotumor with Cranial Invasion and Bone Destruction." North American Neuro-ophthalmology Society/Walsh Presentation. March 28, 2004.

" "Facial Pain Syndromes." Neuro-ophthalmology Symposium. Doheny Eye Institute. February 14, 2004.

" "Amniotic Membrane Transplant in the Treatment of Fat Adherence Syndrome." Doheny Alumni Conference. June 14, 2003.

" "Canalicular Stenosis in a Patient Treated with Systemic 5-fluorouracil." Doheny Alumni Conference. June 7, 2002.

" "Severe Sebaceous Cell Carcinoma Necessitating Evisceration in a 97 Year-old Male." Doheny Eye Institute Resident Conference. January 2002.

" "Neurotrophic Keratitis." Doheny Alumni and Residents' Conference. June 16, 2001.

" "Choroidal Metastasis as Presenting Sign of Systemic Malignancy in a 35 Year-old Male." Doheny Eye Institute Grand Rounds. June 1, 2001.

" "Hypertensive Retinopathy in a 44 Year-old Male." Doheny Eye Institute Grand Rounds. May 18, 2001.

" "Ocular Rosacea in a 42 Year-old Male." Doheny Eye Institute Grand Rounds. April 13, 2001.

" "Ocular Malingering in a 16 Year-old Female." Doheny Eye Institute Grand Rounds. March 9, 2001.

" "Cat-scratch Neuroretinitis in a 53 Year-old Female." Doheny Eye Institute Grand Rounds. February 9, 2001.

" "Neurofibromatosis II in a 23 Year-old Male." Residents' Day Conference. Doheny Eye Institute. January 13, 2001.

" "Pseudoexfoliation Syndrome." Residents' Day Conference. Doheny Eye Institute. January 13, 2001.

" "Central Retinal Artery Occlusion in a 60 Year-old Male." Doheny Eye Institute Grand Rounds. Novermber 17, 2000.

" "Blebitis Post-trabeculectomy in an 81 Year-old Female." Doheny Eye Institute Grand Rounds. October 13, 2000.

" "56 Year-old Male with New Onset Diplopia Secondary to Neurocysticercosis." Doheny Eye Institute Grand Rounds. September 1, 2000

" Candida Chorioretinitis in a 35 Year-old Male IV Drug User." Doheny Eye Institute Grand Rounds. August 18, 2000.

" "Central Serous Retinopathy in a 30 Year-old Male." Doheny Eye Institute Grand Rounds. July 28, 2000.

¨ "Anterior Uveitis in a 22 Year-old Female with Crohn's Disease." Doheny Eye Institute Grand Rounds. July 14, 2000.

¨ "Pseudoexfoliation Glaucoma." Jules Stein Eye Institute Glaucoma Conference. September, 1998.

Publications

¨ Hoehn A, Agarwal MR, Saini A. Third nerve palsy as a presenting sign of preeclampsia. Obstetrics and Gynecology. Pending

¨ Tokuhara K, Agarwal MR.A Severe case of adult onset asthma associated orbital xanthogranuloma. Archives of Ophthalmology. Pending

¨ Hsu V, Agarwal MR. Ig A associated orbital plasmacytoma. Journal of the Ophthalmic Plastic and Reconstructive Surgery. Pending.

¨ Hsu V, Agarwal MR. Squamous cell carcinoma in the anophthalmic socket. Journal of Ophthalmic Plastic and Reconstructive Surgery. Pending publication.

¨ Sorenson K, Agarwal MR. Septo-Optic Dysplasia as Failure to Thrive. Journal of Family Medicine, 2007, p. E2-E4.

¨ Bekendam P, Narvaez J, Agarwal MR. Corneal Melting associated with the use of topical nepafenac. Cornea, 2007, p. 1002-1003.

¨ Agarwal MR, Yoo JH. Optic nerve sheath fenestration for vision preservation in Idiopathic Intracranial Hypertension. Journal of Neurosurgery/Neurosurgery Focus, November 2007, 23(5): E7 (p. 1-4).

¨ Kronberg B, Agarwal MR. Pituitary apoplexy with catastrophic visual field loss. Resident and Staff Physician, January 7, 2008, E1-4.

¨ Dovich J, Agarwal MR. Deep Venous Malformation extending from lower face to deep orbit causing intermittent pupillary defect. North American Neuro-Ophthalmology Society, February 28, 2006.

¨ Agarwal MR, Wagner P. Disc edema as first sign of recurrence of acute lymphoblastic leukemia. Journal of Pediatric, May 2006, 148(5):703.

¨ Zoumalan CI, Agarwal M, Sadun AA. Optical coherence tomography can measure axonal loss in patients with ethambutol-induced optic neuropathy. Graefes Arch Clin Exp Ophthalmol, May 2005, 243(5):410-6.

¨ Agarwal MR, Esmaeli B, Burnstine MA. Squamous metaplasia of the canaliculi associated with 5-fluorouracil: A clinicopathologic case report. Ophthalmology, 2002:109(12): 2359-61.

¨ King JA, Affeldt JC, Agarwal MR. Etiologic profile of vortex keratopathy. Investigative Ophthalmoly and Visual Science, 2003: 44(4):277.

¨ Jacobson E K, Affeldt JC, Agarwal MR. Contact lens related limbal stem cell deficiency. Investigative Ophthalmoly and Visual Science, 2003: 44(4):301.

¨ Hedayi RS, Affeldt JC, Agarwal MR. Epithelial basement membrane dystrophy and dry eye. Investigative Ophthalmoly and Visual Science, 2003; 44(4):460.

¨ Hunter K, Affeldt J, Agarwal MR. Efficacy of staged punctual occlusion for treatment of neurotrophic keratitis. Investigative Ophthalmoly and Visual Science, 2003; 44(4):406.

¨ Row PK, Affeldt JC, Agarwal MR. Central isolated band keratopathy and neurotrophic keratitis. Investigative Ophthalmoly and Visual Science, 2003; 44(4):410.

¨ Agarwal MR, Feldon SE, Nguyen V. Clinical features of Graves' ophthalmopathy in a Latino incidence cohort. Investigative Ophthalmoly and Visual Science, 2002; 43(4):337.

¨ Jacobson E K, Affeldt JC, Quiroz B, Agarwal MR, et al. Retinal surgery related neurotrophic keratitis. Investigative Ophthalmoly and Visual Science, 2002; 43(4):57.

¨ King JA, Affeldt JC, Agarwal MR. Central Corneal Hypoesthesia Secondary to Peripheral Corneal Inflammatory Disease. Investigative Ophthalmoly and Visual Science, 2002; 43(4):34.

¨ Kurteeva K, Affeldt JC, Albini T, Agarwal MR. Fibrillary lines: new clinical, ultrastructure, and theoretic observations. Investigative Ophthalmoly and Visual Science, 2002; 43(4):1663.

¨ Affeldt JC, Agarwal MR. Lasik-related stage III neurotrophic keratitis. Investigative Ophthalmoly and Visual Science, 2002; 43(4):2120.

¨ Agarwal MR, Affeldt JC, Heidar-Hunter K. Dry Eye and the Treatment of Neurotrophic Keratitis. Investigative Ophthalmoly and Visual Science, 2001; 42(4):S31

¨ Prendiville P, Chopra M, Gauderman WJ, Feldon SE. The role of restricted motility in determining outcomes for vertical strabismus surgery in Graves' ophthalmopathy. Ophthalmology, 2000; 107(3):545-549.

¨ Radziszewski W, Chopra M, Zembowicz A, Gryglewski R, Ignarro LJ, Chaudhuri G. Nitric oxide donors induce extrusion of cyclic GMP from isolated human blood platelets by a mechanism which may be modulated by prostaglandins. Intl J Cardiol, 1995; 51:211-220.

¨ Radziszewski W, Zembowicz A, Chopra M, Gryglewski R., Ignarro LJ, Chaudhuri G. Nitric oxide donors induce efflux of cyclic GMP from human blood platelets. The Federation of the American Society of Experimental Biologists (FASEB) Journal, 1994; 8(4):A337.

Book Chapters

¨ Sadun AA and Agarwal MR: Topical Diagnoses in Neuro-ophthalmology. In Walsh and Hoyt's Clinical Neuro-Ophthalmology. Sixth Edition. Williams & Wilkins, Baltimore. 2005.

Professional Certifications

¨ Board Certified, American Academy of Ophthalmology
¨ North American Neuro-ophthalmological Society
¨ American Academy of Ophthalmology
¨ American Society of Cataract and Refractive Surgery
¨ UCLA Association of Chemists and Biochemists

Volunteer Experience

¨ Board of Directors, UCLA Medical Alumni Association (1995-1999)
¨ UCLA Medical Center Career Conference Planning Committee (1995-1999)
¨ Celebration of Sight at Cedars Sinai Medical Center (1998)
¨ San Fernando Valley Health Fair- Ophthalmic screening exams (1998)
¨ Camp Ronald McDonald for Good Times- Pediatric Oncology (1997-1999)
¨ Umma Free Clinic- Downtown Los Angeles (1997-1999)
¨ Salvation Army Homeless Clinic (1997-1998)

Personal Interests

¨ Ballroom dance, cooking, running

Videos

Meet Dr. Agarwal Video

Popular reading

Dr. Agarwal's Curriculum Vitae
Oculoplastic Surgery
Directions to Dr. Agarwal's Office
Eyelid growths/lumps
Testimonials from Dr. Agarwal's patients
Optic Neuritis

Dr. Agarwal's Presentations
Double Vision
Entropion/Ectropion
Multiple Sclerosis

QUICK LINKS

Home
Forms
Photo Gallery
Testimonials

WHAT I DO

Ischemic Optic Neuropathy
Double Vision
Optic Neuritis
Multiple Sclerosis Related Eye Disease
Hemifacial Spasm
Graves Disease

RECENT POSTS

Lecture
(March 11, 2016)

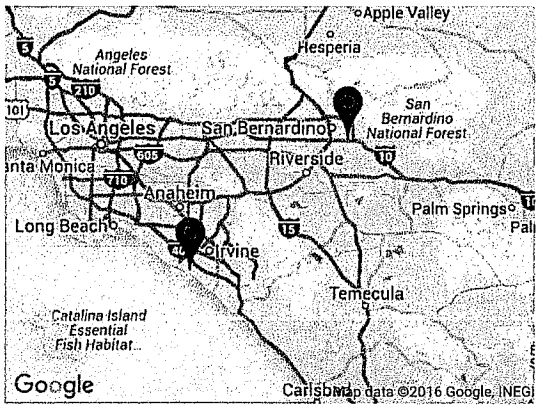
Los Angeles Tonight!
(February 23, 2016)

UCLA Stein Eye-Doheny Eye
(February 17, 2016)

CALIFORNIA ORBITAL CONSULTANTS

1200 California St., Suite 140
Redlands, CA 92374
Phone: (909) 792-6000
Fax: (909)792-6001
dr@myeyelidsurgeon.com

360 San Miguel Dr, Ste 307
Newport Beach, CA 92660
Phone: (949) 441-5058
Fax: (866)777-5972
dr@myeyelidsurgeon.com



North American Neuro-Ophthalmology Society

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Golareh Fazilat, MD
16100 Sand Canyon Ave, Ste. 385
Irvin, CA 92618
Office Phone: (949)502-3333
Mobile: (949)836-0078
Gfazilat @hotmail.com

JOBS

Director of Pediatric Ophthalmology — **2014-present**
Specialized in Strabismus and Amblyopia treatment
Children's Eye Center of Orange County

Pediatric Ophthalmologist — **2012- present**
Foot Hill Eye Medical Group

Assistant Professor of Clinical Ophthalmology — **2009- 2012**
Specialized in Strabismus and Amblyopia treatment
Vision Center at Children's Hospital Los Angeles
University of Southern California Keck School of Medicine

EDUCATION

Pediatric Ophthalmology Fellowship
University of Southern California — **2007- 2008**
Children's Hospital Los Angeles

Ophthalmology Residency
George Washington University — **2005-2007**

Ophthalmology Residency
Northwestern University Hospital — **2003-2005**

Internal Medicine Internship
Washington Hospital Center — **2002-2003**

Medical School
Howard University Medical School — **1998-2002**
MD
Class rank: top 10 % (AOA)

Undergraduate
George Mason University — **1994-1997**
BS Biology

Undergraduate
University of Cincinnati — **1992-1994**
Biology major

RESEARCH

Children's hospital Los Angeles / University of Southern California **2008**
Clinical Characteristics of Pattern Exotropia in Children

George Washington University **2005-2007**
Intravitreal Bevacizumab in the Treatment of CSME
Intravitreal Bevacizumab in the Treatment of Exudative ARMD
Intravitreal Bevacizumab in the Treatment of Retinal Vein Occlusion Associated CME
Effect of sleep Deprivation on the Performance of Simulated Cataract Extraction

National Institute of Health, National Eye Institute
Research assistant **1996-1998**
Designed & developed a project in the role of Apoptosis & Aldose reductase activity in diabetic like corneal epitheliopathy in the galactose- fed rat. Involved in methods to improve the retinal digestion technique. Involved in DNA laddering technique to investigate the epitheliopathy in diabetic patients. Responsible for preparing & immunochemical staining of the slides

George Mason University
Research assistant:
Biology Department **1994-1995**

University of Cincinnati,
Research Assistant:
Psychiatry Department **1993-1994**
Cardiac Surgery Department **1992-1994**
Pharmacology Department **1991-1992**
Environmental Health Department **1990-1991**

PRESENTATIONS/ABSTRACTS

***G.Fazilat, MD**, A. Buffenn, MD, Clinical Characteristics of Pattern Exotropia in Children,* 2009 AAPOS Annual Meeting (submitted)
***G.Fazilat, MD**, A. Prasad, MD, R.D. Patel, B.E. Jones, MD, Intravitreal Bevacizumab in the Treatment of CSME,* ARVO 2006 Annual Meeting, program # 3833/B873
***G. Fazilat**, G. Robinson PHD, Role of Apoptosis & Aldose reductase activity in diabetic like corneal epitheliopathy in the galactose- fed rat,* National Eye Institute 1998 Annual Meeting, Oral & Poster Presentation

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TEACHING ACTIVITIES
Childrens Hospital Los Angeles **2012**

G. Fazilat, MD, CME course on Pediatric Ophthalmology for Pediatricians in the greater Los Angeles area

USC/LAC-USC/Childrens Hospital Los Angeles **2007-2012**

G. Fazilat, MD., Ocular Trauma, Resident lecture, July 2008

Assisted in clinical teaching of residents and medical students in pediatric ophthalmology and strabismus

George Washington University **2005-2007**

G. Fazilat, MD., OKAP review, Resident review

Assisted in clinical teaching of rotating medical students

Northwestern University Hospital **2003-2005**

Assisted in clinical teaching of rotating medical students

Howard University Medical school **1999-2000**

Hired instructor to medical students for summer course titled medical neuroscience.

AWARDS/HONORS

Howard University Medical School

National Honor Society (AOA)	**1998-2002**
Outstanding performances in the Pediatric & OB/GYN rotations	**2002**
Medical Alumni Association Scholarship	**1999 & 2000**
HCOP Summer directed Study Program teaching Award	**2000**
George Mason University	**1994-1997**
National Honor Society	
University Scholarship	
University of Cincinnati	**1992-1994**
National Honor Society	
Four Academic Excellence Recognition Awards	
National Collegiate Minority Leadership Award	
T.Turner Scholarship Award	
Member of Who is Who American Honor Society	

My Autobiography was published in the United States Achievement Academy, vol. 4

PROFESSIONAL ORGANIZATION

AAPOS- active member	**2007-Present**
ARVO	**2006-2007**
American Academy of Ophthalmology	**2003-Present**
Women in Medicine	**2000-2003**

Licenses & Certifications

California State Medical License	**2008-Present**
DEA Practitioner Registration	**2008-Present**
Board certified Ophthalmologist	**2008-Present**

VOLUNTEER EXPERIENCE

Sea Change	**2007**
Surgical and medical ophthalmology mission trips to Philippines	
Internal Medicine Private Practice office	**2000-2001**
Reston Hospital, VA Emergency Department	**1995-1996**

INTERESTS/LANGUAGES

Fluent in English & Farsi,
Studied Arabic & German
Traveling, sports & dancing
Participating in the community services

CITIZENSHIP

United States

REFERRENCES

Mark S. Borchert, MD
Division head
Department of Pediatric Ophthalmology
Children's Hospital Los Angeles / University of southern California
(323)361-4510

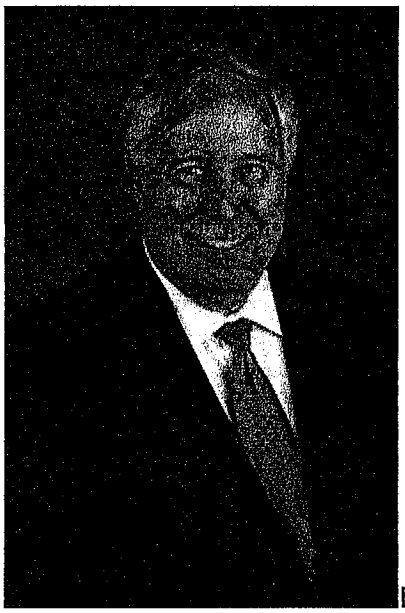
Angela N. Buffenn, MD
Fellowship program director
Department of Pediatric Ophthalmology
Children's Hospital Los Angeles / University of southern California
(323)361-5603

Craig Geist, MD
Chairman
Department of Ophthalmology
George Washington University
(202)741-2800

Mohamad Jaafar, MD
Chairman
Department of Pediatric Ophthalmology
Childrens Hospital Washington DC/George Washington University
(202)884-3017

Bahram Rahmani, MD
Professor of Clinical Pediatric Ophthalmology
Children's Hospital Chicago/Northwestern University
(773)880-4346

Dr. David J. Schanzlin



Dr. David Schanzlin is a past Professor and Director of Keratorefractive Surgery at the UCSD Department of Ophthalmology's Shiley Eye Center. Known as a leader in the field of keratorefractive surgery for more than 25 years, Dr. Schanzlin has devoted his career to developing corrective surgery procedures for the improvement of conditions such as nearsightedness, farsightedness, and astigmatism. Dr. Schanzlin has consistently been recognized as one of the Best Doctors in America®, and he is the recipient of the Jose I. Barraquer Award for exemplifying scientific dedication and making significant contributions to the refractive surgery field. Dr. Schanzlin has appeared as an expert on the Today Show, ABC News, Extra, and in a variety of features on local affiliates.

Dr Schanzlin earned his medical degree at the University of Chicago, and completed his residency at the same institution. He then obtained fellowships at the University of California-San Francisco's Proctor Foundation. Dr. Schanzlin formerly served as Professor and Chairman at Saint Louis University's Department of Ophthalmology. He is also a past Director of the Anheuser-Busch Eye Institute. An educator and innovator in his field, Dr. Schanzlin was the worldwide lead investigator over the 13 years of clinical studies and development for INTACS®. In fact, he is considered by many to be the leading authority on this procedure in the world.

Dr. Schanzlin was elected by his peers as President of the International Society of Refractive Surgery, in which he served from 1998 to 2000. He is listed as a co-inventor on the patent for use of ultrashort pulse laser cataract surgery, which is designed to provide enhanced accuracy for lens implant treatments. While refractive surgery is a major focus of his efforts here at Gordon Schanzlin New Vision Institute Institute, Dr. Schanzlin also specializes in cataract surgery and anterior segment disease.

Known as a global authority on refractive surgery, Dr. Schanzlin has lectured in Asia, South America, and Europe. He is also a prominent speaker at eye society conventions and conferences here in the US.

Education

- University of Chicago – MD, 1975
- University of Chicago – Residency; Chief Resident in Ophthalmology
- University of Pittsburgh – Fellowship
- University of California at San Francisco – Fellowship

Administration

Dr. Schanzlin was invited by the University of California-San Diego to join the Shiley Eye Center in La Jolla in order to form a center of refractive surgery that would be recognized worldwide. He went on to establish the Shiley Eye Center as a prominent educational resource for ophthalmologists across the globe. These skilled eye doctors are able to learn about the latest in clinical practice and research of laser eye surgery from the Center. During his time at Shiley Eye Center, Dr. Schanzlin built out the keratorefractive surgery fellowship experience so ophthalmologists who have already completed their initial training can specialize in this advancing field of vision care.

If you would like more information, or if you would like to schedule a consultation with one of our experienced ophthalmologists, please contact Gordon Schanzlin New Vision Institute Institute today.

Sanford Chen, M.D. is a board-certified vitreoretinal surgeon who has been a partner at Orange County Retina since 1993.

Dr. Chen received his medical degree at the age of 23 from an accelerated Premedical–Medical program at the University of Michigan. This was followed with an internship in internal medicine at Yale. Dr. Chen's ophthalmology residency was completed at the Scheie Eye Institute – University of Pennsylvania. While performing his retina fellowship at the Massachusetts Eye Infirmary – Harvard Medical School, he was also granted an academic research fellowship at the Eye Research Institute.

Dr. Chen is a nationally and internationally recognized retina specialist who is actively involved in clinical research. He has participated as principal investigator in over 30 multicenter trials. Complimenting his research endeavors, Dr. Chen serves on numerous scientific advisory boards and is a frequent invited speaker at national and international conferences. He is also a consultant to many biotech, surgical, and pharmaceutical companies involved in the development of new treatments, surgical techniques, and instrumentation. He has particular expertise in age-related macular degeneration, diabetic retinopathy, retinal vascular disease, and surgical management of macular pathology.

Dr. Chen is also a contributor to medical literature having authored abstracts, original papers, and book chapters. He serves as a scientific editorial reviewer for Ophthalmology, Archives of Ophthalmology, and British Journal of Ophthalmology.

Dr. Chen has been widely recognized by his professional colleagues and peers, by being listed in "Physicians of Excellence," "Best Doctors," and "Who's Who lists" on an annual basis. He has been featured on national syndicated television shows such as "The Doctors." He also serves as a team retinal surgeon to the Anaheim Ducks (National Hockey League).

Dr. Chen lives in Laguna Beach, California with his wife and baby daughter. His hobbies include ice hockey, skiing, golf, and piano. He enjoys giving back to his community and participates in several volunteer organizations and has performed medical missionary services to Armenia and China

CURRICULUM VITAE

SANFORD CHEN, M.D.

Fellow, American Academy of Ophthalmology
Fellow, American College of Surgeons

Mailing/Contact Address:
Orange County Retina Medical Group
1200 North Tustin Avenue, Suite 140
Santa Ana, California 92705
714-972-8432

PROFESSIONAL PRACTICE AFFILIATIONS

Orange County Retina Medical Group
Physician/Surgeon/Partner
Since 9/1/1993

1200 North Tustin Avenue	Suite 140	Santa Ana, CA 92705	714-972-8432
1200 North Tustin Avenue	Suite 100	Santa Ana, CA 92705	714-972-8432
24022 Calle de la Plata	Suite 475	Laguna Hills, CA 92653	949-581-3618
320 Superior Avenue	Suite 160	Newport Beach, CA 92663	949-646-3242
333 W. Bastanchury Road	Suite 200	Fullerton, CA 92835	714-451-0801
31451 Rancho Viejo Road	Suite 101	San Juan Capistrano, CA 92675	949-496-0611

EDUCATION AND TRAINING

Vitreo-Retinal Fellowships
Clinical Fellow in Vitreoretinal Diseases and Surgery
Harvard Medical School, Massachusetts Eye and Ear Infirmary
Eye Research Institute of The Retina Foundation, Boston, Massachusetts, 1991-1993

Retina Research Fellow
Harvard Medical School
Schepens Eye Research Institute, Boston, Massachusetts, 1991-1993

Residency in Ophthalmology
University of Pennsylvania School of Medicine
Scheie Eye Institute, Philadelphia, Pennsylvania, 1988-1991

Internship in Medicine
Yale University School of Medicine
Yale-New Haven Hospital, New Haven, Connecticut, 1987-1988

Accelerated Pre-Medical/Medical Program
Bachelor of Science, Biomedical Sciences/Medical Doctorate
University of Michigan, Ann Arbor, Michigan, 1981-1987

Secondary Education
The Perse School for Boys, Cambridge, England, 1978-1979
Wylie E. Groves High School, Birmingham, Michigan, 1979-1981

BOARD CERTIFICATION

National Board of Medical Examiners
American Board of Ophthalmology

LICENSURE

California, Issued 1993

HONORS AND ACHIEVEMENTS

Top Doctors, US News and World Report 2012

Castle Connolly Top Doctor 2012

Physician of Excellence Award, Orange County Medical Association, Orange Coast Magazine
2013, 2012, 2010, 2009, 2008, 2006, 2005

Patients' Choice Physician Award , MDx Medical
2012, 2009

Volunteer Faculty Recognition Certificate for16 Years of Service
Department of Ophthalmology, School of Medicine
University of California, Irvine, CA, April 2010

America's Top Ophthalmologists, Consumers' Research Council of America, 6th Edition, 2009

Super Doctors of Los Angeles, Key Professional Media, November 2008

Life Member, National Registry of Who's Who, 2001

Honored Member, Strathmore's Who's Who in America, 1999-2000

Outstanding Young Men of America, 1998

Golden Key National Honor Society

Frank Robbins Scholarship

University of Michigan Alumni Award Scholarship

State of Michigan Competitive Scholarship

Magna Cum Laude

Phi Beta Kappa

Who's Who in American Schools

Winner of American Association of Teachers of French National Language Contest

Certificate of High Scholarship

National Honor Society

MENSA

PROFESSIONAL BACKGROUND

2012-Present	Consulting Physician, Genentech, Inc., San Francisco, California
2012-Present	Consulting Physician, Regeneron Pharmaceuticals, Tarrytown, New York
2010-Present	Associate Clinical Professor in Ophthalmology, University of California, Irvine School of Medicine
2008-Present	Consulting Physician, Alimera Sciences, Alpharetta, Georgia
2005-Present	Reviewer, British Journal of Ophthalmology
2005-Present	Retinal Advisory Council II, Alcon Surgical, Irvine, California
May 2004	Honorary Professor, Liao Cheng People's University & Hospital, Liao Cheng, China
2001-Present	Consulting Physician, Allergan, Irvine, California
2001-Present	Reviewer: Archives of Ophthalmology
2000-Present	Novartis Ophthalmics Advisory Board
2000-Present	Reviewer, Ophthalmology Journal of the American Academy of Ophthalmology, Elsevier Publications
2000-Present	Physician's Advisory Board, National Republican Congressional Committee, Washington, D.C.
2000-Present	Consulting Physician, Leerink, Swann, & Company / MEDACorp, Boston, Massachusetts
1995-2006	Consulting Physician, Veterans Administration Hospital, Long Beach, California
1994-2010	Assistant Clinical Professor in Ophthalmology, University of California, Irvine School of Medicine
1991-1993	Research Associate, Eye Research Institute of the Retina Foundation, Harvard Medical School, Boston, Massachusetts
1988-1991	Instructor in Ophthalmology, University of Pennsylvania School of Medicine, Philadelphia, Pennsylvania

Speakers Bureau
Alcon Laboratories
Allergan
Eyetech Inc.
Genentech
Inspire Pharmaceuticals
Novartis Ophthalmics
Pfizer Ophthalmics
Regeneron Pharmaceuticals

Advisory Boards
Alcon Laboratories
Allergan
Eyetech, Inc.
Genentech
Regeneron Pharmaceuticals
Thrombogenics

PROFESSIONAL SOCIETY MEMBERSHIPS

1988 – Present	American Academy of Ophthalmology, Fellow
1989 – Present	Chinese American Ophthalmological Society
1989 – Present	Association for Research in Vision and Ophthalmology
1993 – Present	California Medical Association
1993 – Present	Orange County Medical Association
1993 – Present	California Association of Eye Physicians and Surgeons
1993 – Present	Orange County Society of Ophthalmology Executive Committee, Program Chairman, 1998-1999 Secretary/Treasurer, 1999-2001 Vice President, 2002-2003 President, 2004-2005
1993 – Present	Schepens International Society
1994 – Present	American College of Surgeons
1995 – Present	American Society of Retina Specialists (The Vitreous Society)
1996 – Present	Western Retina Study Club
2004 – Present	Club Vit

HOSPITAL/SURGERY CENTER AFFILIATIONS

1993 – Present	Western Medical Center, Santa Ana, California
1993 – Present	Hoag Memorial Hospital Presbyterian, Newport Beach, California
1994 – Present	St. Joseph Hospital, Orange, California
1994 – Present	Children's Hospital of Orange County, Orange, California
1994 – Present	Medical Center - University of California, Irvine, California
1994 – Present	Pacific Hills Surgery Center, Laguna Hills, California
1997 – Present	Anaheim Regional Medical Center, Anaheim, California
2002 – Present	Children's Hospital at Mission, Mission Viejo, California
2010 – Present	Barranca Surgery Center, Irvine, California

PROFESSIONAL PRESENTATIONS

01. *The Acute Effect of Topical Epinephrine on Macular Blood Flow in Humans*
Association for Research in Vision and Ophthalmology, Sarasota, Florida; April 1990

02. *Does Topical Timolol Affect Human Macular Capillary Blood Flow?*
University of Pennsylvania Alumni Meeting, Philadelphia, Pennsylvania; April 1991

03. *Advances in Genetic Eye Diseases: Genetics of Retinoblastoma*
Harvard Medical School, Massachusetts Eye and Ear Infirmary, Boston, Massachusetts; January 1992

04. *Acute Myelogenous Leukemia Presenting as Central Serous Retinopathy*
Schepens Alumni Meeting, Boston, Massachusetts; June 1992

05. *The Mechanism of Optic Nerve and Posterior Pole Injury after Blunt Ocular Trauma*
American Academy of Ophthalmology, Dallas, Texas; November 1992

06. *The Acute Effect of Topical Timolol on Human Macular Capillary Blood Flow*
Association for Research in Vision and Ophthalmology, Sarasota, Florida; May 1993

07. *Current Treatment of Endophthalmitis*
Advances in Pneumatic Retinopexy.
Surgical Management of Dislocated Lens
Humanitarian Trip, Yerevan, Armenia; September 1994

08. *Techniques and Complications of Pneumatic Retinopexy*
American College of Surgeons: Indian Wells, California; January 1995

09. *New Advances in Diabetic Retinopathy*
Humanitarian Trip, Yerevan, Armenia; September 1995

10. *Age-related Macular Degeneration & Subretinal Neovascular Diseases*
Invited Lecturer to UCI Residents. University of California, Irvine, Department of Ophthalmology; February 1997

11. *The Use of Silicone Oil in Pseudophakic Patients*
American Society of Cataract and Refractive Surgeons, Boston, Massachusetts; April 1997

12. *Age-Related Macular Degeneration and Subretinal Neovascular Diseases*
Invited Lecturer to UCI Residents. University of California, Irvine, Department of Ophthalmology; February 1998

13. *Age-Related Macular Degeneration and Subretinal Neovascular Diseases*
Invited Lecturer to UCI Residents. University of California, Irvine, Department of Ophthalmology; January 1999

14. *Unifocal Helioid Choroidopathy*
Western Retina Study Club, Newport Beach, California; March 1999

15. *Nursing Implications for Retinopathy of Prematurity*
St. Joseph Hospital, Orange, California; May 1999

16. *Retinopathy of Prematurity Screening*
Children's Hospital of Orange County, Orange, California; May 1999

17. *Diabetes and the Eye - The Importance of the Seven Fields in Diabetic Retinopathy*
Ophthalmic Photographers' Society, Los Angeles, California; June 1999

18. *Retinopathy of Prematurity Screening*
Martin Luther Hospital, Anaheim, California; July 1999

19. *Retinopathy of Prematurity*
Children's Hospital of Orange County, Orange, California; November 1999

20. *Age-related Macular Degeneration & Subretinal Neovascular Diseases*
Invited Lecturer to UCI Residents. University of California, Irvine, Department of Ophthalmology; February 2000

21. *Innovations in Treatment of Macular Degeneration*
EENT Department Presentation, St. Joseph Hospital, Orange, California July 2000

22. *An Introduction to Photodynamic Therapy*
Ophthalmic Photographers' Society, San Diego, California; August 2000

23. *Latest Developments in Retinopathy of Prematurity*
California Children's Services, Orange County, Santa Ana, California; May 2001

24. *Multiple Cystic Granulomas as a Complication of Silicone Oil Use in Vitreoretinal Surgery*
Association for Research in Vision and Ophthalmology, Sarasota, Florida; May 2001

25. *Update and Review of Visudyne Photodynamic Therapy*
The Western Association for Vitreoretinal Education, Maui, Hawaii; July 2001

26. *Unique Cases of Visudyne Therapy*
National Optometry Advisory Board, Key West, Florida; November 2001

27. *Introduction to Photodynamic Therapy*
Ophthalmic Photographers' Society 32nd Annual Educational Program, New Orleans, Louisiana; November 2001

28. *Managing Patients' Expectations for Verteporfin Therapy*
Royal Hawaiian Eye Meeting,Waikoloa, Hawaii; January 2002

29. *Results of Clinical Trials and Adverse Events*
South America Visudyne Launch "Introduction to Photodynamic Therapy", Lima, Peru; April 2002

30. Council on Optometric Practitioner Education Educators' Meeting: Carlsbad, California
Treatment of AMD with Photodynamic Therapy
April 2002

31. *Clinical Decisions in Managing AMD*
National Optometry Advisory Board, Colorado Springs, Colorado; June 2002

32. *Radial Optic Neurotomy for CRVO*
25g Transconjunctival Vitrectomy
XXXth Congreso Nacional de Oftalmologia, Cartegena, Colombia; September 2002

33. *New Treatment Strategies for AMD*
American Academy of Optometry, San Diego, California; December 2002

34. *Update of New Treatment Options in AMD*
Optometry Educator's Meeting, Scottsdale, Arizona; March 2003

35. *Interpreting Data from Open Label Phase I/II AMD Trials*
American Society of Retina Specialists Annual Meeting, New York, New York; September 2003

36. *Retinopathy of Prematurity*
Resident Conference Lecture Children's Hospital of Orange County; September 2003

37. *Treatment Trends in Macular Disease*
Ophthalmic Photographers' Society 34th Annual Educational Program, Anaheim, California; November 2003

38. *Retinopathy of Prematurity*
Children's Hospital of Orange County, Orange, California; May 2004

39. *New Advances in Surgical Retina*
Goodwill Medical Delegation. Jinan, Liao Cheng, Cheng Du, Shanghai, Peoples' Republic of China; May 2004

40. *The Great Debates: Controversies in Retinal Disease 2005*
Invited Speaker. Medical Education Seminar, University of California, Irvine, Beckman Laser Center; March 2005

41. *Retinopathy of Prematurity*
Resident Lecture. Children's Hospital of Orange County, Orange, California; March 2006

42. *Management of AMD: Looking to the Future*
Rio Hondo Optometric Society, La Mirada, California; June 2007

43. *Short Term Outcomes of Multi-center 23g Vitrectomy*
Club Vit Meeting, Bachelor Gulch, Colorado; July 2007

44. *Evolution Of AMD Management*
Invited Speaker. QLT Meeting, Honolulu, Hawaii; October 2007

45. *New Clinical Trials for Age-Related Macular Degeneration*
Rio Hondo Optometric Society, La Mirada, California; November 2007

46. *Strategies for Managing Patients with Neovascular AMD – A Case Study Series*
Novartis Speaking Engagement, Los Angeles, California; September 2008

47 *Advances in Treatment for Exudative Age-Related Macular Degeneration*
Novartis Speaking Engagement, Park City, Utah; April 2008

48. *Alimera Sciences FAME Study. 36-Month Results of Iluvien: Single Insert Outcomes*
Club Vit Meeting, Santa Monica, California; 2011

49. *Voclosporin: Overview and Clinical Development*
Lux Protocol LX211-11, Lux Biosciences, Costa Mesa, California; September 2011

50. *Minimizing Intraoperative Hypotony during Vitrectomy*. American Society of Retina Specialists, Las Vegas, Nevada; August 2012

51. *Iontopheretic Dexamethasone Phosphate Opthalmic Suspension in Patients with Non-Infectious Anterior Segment Uveitis: Introduction*
EyeGate Protocol EGP-437-004, EyeGate Pharma, Anaheim, California; October 3, 2012

52. *Developments in the Treatment of Wet AMD*
Regeneron Educational Program, Retina Associates of Orange County, Laguna Hills, California; March 18, 2013

53. *Developments in the Treatment of Wet AMD*
Regeneron Educational Program, Retina Institute, Orange, California; April 4, 2013

54. *Current Treatments for Wet AMD*
Retina Care Symposium, Costa Mesa, California; December 5, 2013

PUBLIC PRESENTATIONS

01. *Diabetic Retinopathy*
Project Health, Western Medical Center, Santa Ana, California; October 1995

02. *Diabetic Retinopathy*
Project Health, Saddleback Medical Center, Laguna Hills, California; April 1996

03. *Complications of Diabetes*
Diabetes Education Series, Invited Speaker, Placentia Linda Hospital, Placentia, California; May 1996

04. *Diabetes and Eye Disease*
Diabetic Discussion Group, Invited Speaker, Costa Mesa Senior Center, Costa Mesa, California; March 1998

05. *Living Well with Diabetes*
Invited Speaker. Diabetes Education Lecture, Placentia Linda Hospital, Placentia, California; September 1998

06. *Photodynamic Therapy for Macular Degeneration*
Invited Speaker. Anaheim Community Center, Anaheim, California; October 2002

07. *Macular Degeneration*
Community Education Lecture, Mission Regional Medical Center, Mission Viejo, California; May 2003

08. *Macular Degeneration*
"The Doctors" CBS Television Production, Broadcast Airing: March 23, 2009

09. *Optic Nerve Abnormalities*
"The Doctors" CBS Television Production, Broadcast Airing March 11, 2009

10. *Optic Nerve Swelling*
"The Doctors" CBS Television Production, Broadcast Airing February 9, 2009

11. *Macular Degeneration and Diabetes Seminar*
Invited Speaker. Low Vision Council, Southern California College of Optometry, Fullerton, California June 2011

CLINICAL RESEARCH

01. Wyeth-Ayerst Pharmaceutical, 1993
Sub-Investigator. *Safety and efficacy of Tolrestat in the treatment of diabetic retinopathy.*

02. CIBA/QLT PhotoTherapeutics, Protocol #BPD-OCR-005 (VAM), 1999
Principal Investigator. *An open-label multicenter safety study of the treatment of predominantly classic subfoveal CNV secondary AMD using PDT with verteporfin for injection.*

03. Eyetech Pharmaceuticals, Protocol #EOP 1004, Phase II/III, 2001-2005
Sub-Investigator. *A randomized, double-masked, controlled, dose-ranging, multi-center comparative trial, in parallel groups, to establish safety and efficacy of intravitreal injections of EYE001 (anti-VEGF pegylated aptamer) in patients with exudative AMD.*

04. Novartis Ophthalmics, Protocol #CBPD952A2201 (ADD-V), Phase II, 2002
Principal Investigator. *ADjunctive Diclofenac therapy and Visudyne PDT (ADD-V): A three-month randomized, placebo-controlled, double-masked, multicenter study of the effect of adjunctive diclofenac therapy and Visudyne PDT in patients with predominantly classic subfoveal CNV secondary to AMD.*

05. Alcon Research, Ltd., Protocol C-01-99, Phase III, 2002-2005
Sub-Investigator. *A multicenter, double-masked, randomized, parallel groups study to demonstrate efficacy and safety of anecortave treatment relative to Visudyne for AMD.*

06. OxiGENE, Inc., Protocol MMD-213, Phase III, 2004-2006
Principal Investigator. *A multi-center, randomized, double-masked, placebo-controlled, parallel group, evaluation of the safety and efficacy of combretastatin A4 phosphate infusion for treating subfoveal CNV in pathologic myopia.*

07. Diabetic Retinopathy Clinical Research Network/National Eye Institute, Protocol B, 2004-2009
Principal Investigator. *A randomized trial comparing intravitreal corticosteroids and laser photocoagulation for DME.*

08. Alcon Research, Ltd., Protocol C-02-60 (AART), Phase III, 2004-2009
Principal Investigator. *Anecortave Acetate Risk Reduction Trial (AART): An evaluation of efficacy and safety of posterior juxtascleral administrations of anecortave acetate for depot suspension (15 mg or 30 mg) versus sham administration in patients (enrolled in study "A" or study "B") at risk for developing sight-threatening CNV due to exudative AMD.*

09. National Eye Institute, SCORE, 2004-2009
Principal Investigator. *The Standard Care vs. Corticosteroid for Retinal Vein Occlusion (SCORE): Two randomized trials to compare the efficacy and safety of intravitreal injection(s) of triamcinolone acetonide with standard care to treat macular edema: one for CRVO and one for BRVO.*

10. Lilly ICOS LLC, Protocol H6D-MC-LVGO, Phase IV, Collaborative Study, 2005-2006
Sub-Investigator. *A randomized, double-blind, parallel-design, placebo-controlled study to evaluate the effects of 5mg tadalafil (IC351, LY450190) and 50mg sildenafil administered once daily for 6 months on visual function in healthy subjects or subjects with mild erectile dysfunction.*

11. Alcon Research, Ltd., Protocol C0459 (IDEAA), Phase III, 2005-2007
Sub-Investigator. *A trial using anecortave acetate 15mg administered every 3 months versus anecortave acetate 15 mg every 6 months versus anecortave acetate 30 mg administered every 6 months in patients with exudative AMD.*

12. Eyetech Pharmaceuticals, Protocol EOP1012, Phase IV, 2005-2007
Principal Investigator. *A randomized, active-controlled, double-masked, single dummy, multicenter comparative trial, in parallel groups, to compare the safety and efficacy of intravitreous injections of Macugen given every 6 weeks for up to 102 weeks, plus sham PDT, to Macugen plus PDT with Visudyne, in subjects with predominantly classic subfoveal CNV secondary to AMD.*

13. Novartis, Protocol CBPD952E2202 (Veritas), Phase IIIB, 2005-2007
Sub-Investigator. *A 24-month randomized, double-masked, sham controlled, multicenter, phase IIIB study comparing PDT with verteporfin (Visudyne) plus two different dose regimens of intravitreal triamcinolone acetonide (1 mg and 4 mg) versus Visudyne plus intravitreal pegaptnanib (Macugen) in patients with subfoveal CNV secondary to AMD.*

14. Alcon, Accurus 23G PPV Field Study, 2006-2007
Principal Investigator. *Short term outcomes of 100 consecutive cases of Alcon 23 gauge surgery for posterior segment diseases (a retrospective, consecutive multicenter, multisurgeon, case series of the short term safety and efficacy of 23 gauge micro-incision pars plana vitrectomy [PPV] surgery using the Alcon 23gauge micro-incision system for a variety of retinal conditions on previously non-vitrectomized eyes).*

15. (OSI) Eyetech, Protocol EOP1023 (LEVEL), Phase IV, 2006-2008
Sub-Investigator. *An open label, multicenter trial of maintenance intravitreous injections of Macugen (pegaptanib sodium) given every six weeks for 48 weeks in subjects with subfoveal neovascular AMD initially treated with a different modality resulting in maculopathy improvement.*

16. Novartis, Protocol #CBPD952A2308 (Denali), Phase IIIB, 2006-2010
Sub-Investigator. *A 24-month randomized, double-masked, controlled, multicenter study assessing safety and efficacy of verteporfin (Visudyne) photodynamic therapy administered in conjunction with ranibizimub (Lucentis) versus ranibizumub (Lucentis) monotherapy in patients with subfoveal CNV secondary to AMD.*

17. Alimera Sciences, Protocol C-01-05-001 (FAME), Phase III, 2006-2011
Principal Investigator. *Fluocinolone Acetonide in Diabetic Macular Edema (FAME): A randomized, double-masked, parallel group, multicenter, dose-finding comparison of the safety and efficacy of ASI-001A 0.5ug/day and ASI-001B 0.2 ug/day fluocinolone acetonide intravitreal inserts to sham injection in subjects with DME (Medidur®).*

18. Regeneron, Protocol VGFT-OD-0605 (VIEW 1), Phase III, 2006-2011
Principal Investigator. *CLinical Evaluation of Anti-angiogenesis in the Retina - Intravitreal Trial 3 (CLEAR-IT 3): A randomized, double-masked, active-controlled phase III study of the efficacy, safety, and tolerability of repeated doses of intravitreal VEGF Trap in subjects with neovascular AMD.*

19. Opko, Protocol ACU-301 (COBALT), Phase III, 2007-2009
Principal Investigator. *COmbining Bevasirinib and Lucentis Therapy (COBALT): A randomized, double-masked, parallel-assignment study of intravitreal bevasirinib sodium, administered every 8 to 12 weeks as maintenance therapy following three injections of Lucentis compared with Lucentis monotherapy every 4 weeks in patients with exudative AMD.*

20. Allergan, Protocol 206207-012, Phase III, 2007-2010
Principal Investigator. *A 52-week, masked, multicenter, randomized, controlled trial (with up to 13 weeks additional follow-up) to assess the safety and efficacy of 700 ug dexamethasone posterior-segment drug delivery system (DEX PS DDS) Applicator System in combination with laser photocoagulation compared with laser photocoagulation alone in the treatment of subjects with diffuse DME.*

21. Vitreoretinal Technologies, Inc., Protocol PVD-301, Phase III, 2007-2010
Principal Investigator. *A safety and efficacy study of Vitreosolve for ophthalmic intravitreal injection for inducing posterior vitreous detachment in subjects with NPDR.*

22. Merck & Co., Protocol 007-01 , Collaborative Study, 2008-2009
Ophthalmology Investigator. *A safety follow-up study of patients previously exposed to MK-0634 (a beta-3 receptor antagonist developed for the treatment of overactive bladder). Subjects had previously been enrolled in a multicenter, double-blind, randomized, placebo-controlled, parallel group, dose-ranging study of L-000796568 in postmenopausal women with OAB.*

23. Allergan, Protocol 206207-019-00, Phase II , 2008-2010
Sub-Investigator. *A 26-week, open-label study to assess the safety and efficacy of 700 ug dexamethasone posterior segment drug delivery system applicator system in conjunction with Lucentis® in the treatment of patients CNV secondary to AMD.*

24. Ophthotech Corp., Protocol OPH3000, Phase I, 2008-2010
Principal Investigator. *An ascending dose and parallel group trial to establish the safety, tolerability and pharmacokinetic profile of multiple intravitreous injections of volociximab ($\alpha5\beta1$ integrin antagonist) as monotherapy or in combination with Lucentis 0.5 mg/eye in subjects with neovascular AMD.*

25. Regeneron, Protocol VGFT-OD-0706 (Da Vinci), Phase III, 2008-2011
Principal Investigator. *A double-masked, randomized, controlled study of the safety, tolerability and biological effect of repeated intravitreal administration of VEGF Trap-eye in patients with DME.*

26. NEI/Tufts Medical Center, The Family Study of Macular Degeneration, 2009-2010
The goal is to evaluate genetic and non-genetic risk factors for AMD

27. Allergan, Protocol 206207-018-00, Phase II, 2008 - 2010
Sub-Investigator. *A 26-week, open-label study to assess the safety and efficacy of 700 ug dexamethasone posterior segment drug delivery system applicator system in the treatment of vitrectomized subjects with DME.*

28. Grunenthal, Protocol KF0151Y/10, Phase IIb, Collaborative Study, 2009-2011
Sub-Investigator. *A randomized, multicenter, double-blind, parallel-group trial to assess the analgesic efficacy and safety of a new analgesic compared with placebo in subjects with painful diabetic peripheral neuropathy.*

29. Endo Pharmaceuticals, Protocol EN3324-201, Phase IIb, Collaborative Study, 2010-2011
Sub-Investigator. *A randomized, multicenter, double-blind, two-arm, multicenter, placebo-controlled study to assess the efficacy and safety of EN3324 (Axomadol) in subjects with moderate to severe chronic low back pain.*

30. GlaxoSmithKline, Protocol MD 7110852, Phase IIB, 2009-2012
Sub-Investigator. *A dose-ranging study of pazopanib eye drops vs. ranibizumab intravitreal injections for the treatment of neovascular AMD.*

31. Genentech, Protocol FVF4579g (HARBOR), Phase III, 2009-2012
Principal Investigator. *A double-masked, multicenter, randomized, active treatment-controlled study of the efficacy and safety of 0.5 mg and 2.0 mg ranibizumab administered monthly or on an as needed basis (PRN) in patients with subfoveal neovascular AMD.*

32. Lux Biosciences, Inc., Protocol LX211-11, Phase III, 2011-2013
Principal Investigator. *A multicenter, double-masked, parallel group, placebo-controlled study to assess the efficacy and safety of Voclosporin as therapy in subjects with active noninfectious intermediate, posterior or pan-uveitis.*

33. Lpath, Protocol LT1009-Oph-003 (NEXUS), Phase IIA, 2011-Present
Principal Investigator. *A multicenter, masked, randomized, comparator-controlled study evaluation Isonep™ (sonepcizumab [LT1009]) as either monotherapy or adjunctive therapy to Lucentis or Avastin versus Lucentis or Avastin alone for the treatment of subjects with choroidal neovascularization secondary to AMD.*

34. Alimera Sciences, Protocol C-01-11-008, Extension Study, 2011-2013
Principal Investigator. *An open-label, multicenter, extension study of the safety and utility of the new inserter of Iluvien® (Fluocinolone Acetonide Intravitreal Insert) 0.19mg and the safety of Iluvien® in subjects with DME.*

35. EyeGate Pharmaceuticals, Protocol EGP-437-004, Phase III, 2012-2013
Principal Investigator. *A prospective, multi-center, randomized, double-masked, positive controlled, clinical trial designed to evaluate the safety and efficacy of iontophoretic dexamethasone phosphate ophthalmic suspension (1%) in patients with non-infectious anterior segment uveitis*

36. Quark Pharmaceuticals, Protocol QRK202 (MATISSE), Phase II, 2012-2013
Principal Investigator. *An open-label dose escalation study of PF-04523655 (Stratum I) combined with a prospective, randomized, double-masked, multi-center, controlled study (Stratum II) evaluating the efficacy and safety of PF-04523655 alone and in combination with ranibizumab versus ranibizumab alone in diabetic macular edema*

37. Xoma, Protocol X052130/CL3-78989-005, Phase III, 2012-Present
Sub-Investigator. *A randomized, double-masked, placebo-controlled study of the safety and efficacy of gevokizumab in the treatement of active non-infectious intermediate, posterior, or pan-uveitis*

38. Pfizer, Protocol B1181003-1050, Phase II, 2012-2013
Principal Investigator. *A phase 2, multi-center, randomized, double-masked, placebo-controlled, multi-dose study to investigate the efficacy, safety, pharmacokinetics and pharmacodynamics of RN6G (PF-04382923) in subjects with geographic atrophy secondary to age-related macular degeneration*

39. Xoma, Protocol X052131/CL3-78989-005 (EYEGUARD™ -C), Phase III, 2012-Present
Sub-Investigator. *A randomized, double-masked, placebo-controlled study of the safety and efficacy of gevokizumab in the treatment of subjects with non-infectious intermediate, posterior, or pan- uveitis currently controlled with systemic treatment*

40. Regeneron Protocol VGFTe-AMD-1124 ((RE-VIEW), Phase IV, 2012-Present
Principal Investigator. *Rigorous evaluation of vision and safety with intravitreal afliberecept injection dosed every 8 weeks over 2 years in neovascular AMD*

41. Merck Protocol MK8931-017 (SCH 900931, P07738), Phase 2/3, Collaborative Study, 2012-Present
Ophthalmology Investigator. *A randomized, placebo controlled, parallel-group, double blind efficacy and safety trial of MK-8931 in subjects with mild to moderate Alzheimer's disease*

42. Ophthotech OPH1003, Phase III, 2013-Present
Principal Investigator. *A randomized, double-masked, controlled trial to establish the safety and efficacy of intravitreous administration of Fovista ™ (Anti-PDGF-B pegylated aptamer) administered in combination with Lucentis® compared to Lucentis® monotherapy in subjects with subfoveal neovascular macular degeneration*

ABSTRACTS

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02. Wald KJ, **Chen S**, Buzney SM, Mehta M, Hirose T, Schepens CL. Retinal detachments associated with isolated optic nerve colobomas. *Retina Society* 1992.

03. Stroh EM, Weiter JJ, DeSousa A, **Chen S**, Buzney SM. What's the best way to examine the vitreous? *Retina Society* 1992.

04. **Chen S**, Wald KJ, Weiter JJ. The mechanism of posterior pole injury after blunt ocular trauma. (suppl) *Ophthalmology* 1992;99:9A.

05. Stroh EM, Weiter JJ, DeSousa A, **Chen S**, Buzney SM. Evaluation of the vitreous by clinical and ultrasonographic methods. *Ophthalmology* 1992;99:9A.

06. DeSousa A, Stroh EM, Weiter JJ, **Chen S**, Buzney SM. Comparison of ultrasonographic techniques in the diagnosis of posterior vitreous detachment. *Ophthalmology 1992;*99:9A.

07. Wald K, Hirose T, **Chen S**, Katsumi O, Mehta M, Liberfarb R. Multiple gestation sibships in stage V retinopathy of prematurity. *Ophthalmology 1992;*99:9A.

08. **Chen S**, Maggiano JM. The use of silicone oil in pseudophakic patients. *ASCRS* 1997

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10. **Chen S**, Abulon DJK. Minimizing intraoperative hypotony during vitrectomy. ASRS 2012

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01. **Chen S**, Robinson F, Riva CE, Petrig BL, Grunwald JE. The acute effects of topical epinephrine on macular blood flow in humans. *Invest Ophthalmol Vis Sci* 1990;31:4.

02. Robinson F, **Chen S**, Petrig BL, Grunwald JE, Riva CE. The acute effect of topical epinephrine on macular blood flow in humans. *Invest Ophthalmol Vis Sci* 1992;33:18.

03. **Chen S**, Stroh EM, Wald K, Jalkh AE. *Xanthomonas maltophilia* endophthalmitis after implantation of a sustained-release ganciclovir implant. *AM J Ophth* 1992;114:6.

04. **Chen S**, Mukai S. Genetics of retinoblastoma. *Int Ophth Clin* 1993;33(1).

05. **Chen S**, Robinson F, Petrig BL, Riva CE. The acute effect of topical timolol on human macular capillary blood flow. *Invest Ophthalmol Vis Sci* 1993;34:4.

06. Stroh EM, **Chen S**, Jalkh AE. Melanocytoma with juxtapapillary nevus: premalignant or benign? *Ann Ophthalmology* 1993;25:11.

07. Brodsky MC, Wald KJ, **Chen S**, Weiter JJ. Protracted post-traumatic optic disc swelling. *Ophthalmology* 1995;102:11.

08. **Chen S**, Nanda M. Ophthalmic surgeries and lasers. *Atlas of Ophthalmic Surgery,* 2nd ed. 1997;Vol. 28:3.

09. Dowell L, **Chen S**. Stereopsis and the ophthalmic photographer: a monocular technique for pairing slides. *J Ophth Photo 1998;*20:87.

10. Tornambe P, **Chen S**, Elliott D, Gallemore R, Jumper J, Nanda S. Advances in the treatment of age-related macular degeneration ophthalmology. *Times* 2005;30:S1.

11. Gupta OP, Ho AC, Kaiser PK, Regillo CD, **Chen S**, Dyer SS, Dugel PU, Gupta S, Pollack JS. Short-term outcomes of 23-gauge pars plana vitrectomy. *Am J Ophthalmol 2008;*146(2):193-197.

12 **Chen S**, Freeman HM, Stroh EM, Wald KJ. Multiple cystic granulomas as a complication of silicone oil use. (submitted for publication 2012, *ARVO*)

13. Campochiaro PA, Brown DM, Pearson A, **Chen S**, Boyer D, Ruiz-Moreno J, Garretson B, Gupta A, Hariprasad S, Bailey C, Reichel E, Soubrane G, Kapik B, Billman K, Kane FE, Green K. Sustained delivery fluocinolone acetonide vitreous inserts provide benefit for at least 3 years in patients with diabetic macular edema. *Ophthalmology* 21Jun2012.

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JEFFREY JOSEPH, MD

Board Certified Ophthalmic Plastic and Reconstructive Surgeon.

ACADEMIC AND PRACTICE AFFILIATIONS

Ophthalmic Plastic and Reconstructive Surgeon
Skin Cancer and Reconstructive Surgery Center
Appearance Center of Newport Beach

Assistant Professor
UC Irvine
Department of Ophthalmology
Gavin Herbert Eye Institute

Ophthalmic Plastic and Reconstructive Surgeon
Inland Eye Specialists

EDUCATION

UC San Diego
Degree: General Biology (pre-med focus)
Minor: Health Care and Social Issues

Boston University School of Medicine
Degree: Medical Doctorate
Honors: Alpha Omega Alpha Honor Society
Pathology Honor Society

Post Graduate
Internship:
St. Vincent's Hospital Manhattan- Transitional Intern

Residency in Ophthalmology:
NYU School of Medicine – Manhattan Eye, Ear, & Throat Hospital

Chief Resident: 2010-2011

Fellowship, Ophthalmic Plastic and Reconstructive Surgery:
University of California, Irvine – Gavin Herbert Eye Institute

RESEARCH & PUBLICATIONS

Textbook Contributions:

Enucleation
Jeffrey M. Joseph MD, Gary J. Lelli, Jr. MD, Christopher I. Zoumalan MD
Encyclopedic Reference of Ophthalmology
Springer Publishing; New York, NY USA
In Press

Evisceration
Jeffrey M. Joseph MD, Gary J. Lelli, Jr. MD, Christopher I. Zoumalan MD
Encyclopedic Reference of Ophthalmology
Springer Publishing; New York, NY USA
In Press

Orbital Implants
Jeffrey M. Joseph MD, Robert Peralta MD, Gary J. Lelli, Jr. MD, Christopher I. Zoumalan MD
Encyclopedic Reference of Ophthalmology
Springer Publishing; New York, NY USA
In Press

Ophthalmic Plastic Surgery; Essential Concepts
Joseph JM, Echegoyen J, Morgan P, Tao JP;
Ophthalmic Microsurgery: Principles, Techniques, and Applications;
Slack; Thorofare, NJ USA.
In press

Online Review Contributions:

Joseph JM, Zoumalan CI.
Lacrimal System Probing and Irrigation.
Medscape Reference. Updated July 25, 2011.
Available at: http://emedicine.medscape.com/article/1844121-overview.

Joseph JM, Solomon JM.
Retrobulbar Block

Medscape Reference. Updated October 7, 2011.
Available at: http://emedicine.medscape.com/article/2000744-overview

Journal Publications:

External versus Endoscopic Dacryocystorhinostomy for Acquired Nasolacrimal Duct Obstruction in a Tertiary Referral Center.
Ophthalmology, Volume 112, Issue 8, Pages 1463 – 1468
G. Ben Simon, J. Joseph, S. Lee, R. Schwarcz, J. McCann, R. Goldberg
August 2005.

Oculocardiac reflex associated with a large orbital floor fracture.
Ophthalmic Plastic and Reconstructive Surgery. Volume 25, Issue 6, Pages 496 – 498
Jeffrey M. Joseph, Caroline Rosenberg, Christopher I. Zoumalan, Richard A. Zoumalan, W. M. White, Richard D. Lisman.
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January 2011

When A Pink Eye Is Not "Pink Eye"- The Low Flow Carotid-Cavernous Fistula
Eyenet
Jeffrey M. Joseph, Floyd A. Warren.
January 2011

Evaluation of the canalicular entrance into the lacrimal sac: An anatomic study.
Ophthalmic Plastic and Reconstructive Surgery. Volume 27, Issue 4, Pages 298-303
C.I. Zoumalan, J.M. Joseph, G.J. Lelli, Jr., K.L. Segal, A. Adeleye, M. Kazim, R.D. Lisman.
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Antibacterial analysis of surgical adhesives.
Plastic and Reconstructive Surgery, Volume 129, Issue 2, Pages 402e-404e
JM. Joseph, A. Voldman, CI. Zoumalan, RD. Lisman, NM. Iovine
February 2012

Periorbital fat grafting and its effect on upper eyelid height
The American Journal of Cosmetic Surgery, Volume 29, No. 3
JM Joseph, BJ Lissauer, AN Kornstein
September, 2012

Needle decompression of acute orbital emphysema: case report with video
British Journal of Ophthalmology, Volume 96, Issue 10, Pages 1346-1347
G Chak, JM Joseph, JP Tao
October, 2012

A positive sentinel lymph node in periocular invasive squamous cell carcinoma: a case series.
Ophthalmic Plastic and Reconstructive Surgery. Volume 29, Issue 1, Pages 6-10
Garrick Chak MD, Payam V Morgan MD, Jeffrey M Joseph MD, Jeremiah P Tao MD, FACS.
January, 2013

The Efficacy of a Midfacial Seal Drape in Reducing Oculofacial Surgical Field Fire Risk
Ophthalmic Plastic and Reconstructive Surgery. Volume 29, Issue 2, Pages 109-112
Jeremiah P. Tao MD, FACS, Kristin E. Hirabayashi BA, Brian T. Kim MD, Feilin A. Zhu MD, Jeffrey M. Joseph, MD, William Nunery MD, FACS
March, 2013

Repair of eyelid retraction due to a trabeculectomy bleb: case series and review of the literature
Ophthalmic Plastic and Reconstructive Surgery.
Ann Shue MD, Jeffrey M Joseph MD, Jeremiah P Tao MD, FACS.
In Press

The Efficacy of a Novel Mobile Phone Application for Goldmann Ptosis Visual Field Interpretation
Ophthalmic Plastic and Reconstructive Surgery.
Robi N. Maamari, BS, Michael V. D'ambrosio, Ph.D, Jeffrey M. Joseph, MD, Jeremiah P. Tao, MD, FACS.
Submitted

Massive Silicone-induced Orbital Granuloma: Case report and literature review.
Ophthalmic Plastic and Reconstructive Surgery.
Ann Shue, MD, Jeffrey M. Joseph, MD; Jeremiah P. Tao, MD, FACS,
Donald S. Minckler, MD, MS
Submitted

Lectures:

Trabeculectomy Bleb-Induced Eyelid Retraction Repair: Case Series and Review of the Literature
Ann Shue MD, Jeffrey M Joseph MD, Jeremiah P Tao MD, FACS.
ASOPRS 43rd Annual Fall Scientific Symposium on
Friday, November 9, 2012, Chicago, IL

Effect of Eyelash Ptosis on Visual Field
Tiffany S Liu MD, Jeffrey M Joseph MD, Jeremiah P Tao MD, FACS.
ASOPRS 43rd Annual Fall Scientific Symposium on
Thursday, November 8, 2012, Chicago, IL

Abstract Publications:

Oculocardiac reflex associated with a large orbital floor fracture: a case report.
Second International Orbital Society Symposium.

Jeffrey M. Joseph, Caroline Rosenberg, Christopher I. Zoumalan, Richard A. Zoumalan, W. Matthew White, Richard D. Lisman.
New York, NY. September 26 and 27, 2008.

Evaluation of the Canalicular System: An Anatomic Study.
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J.M. Joseph, C.I. Zoumalan, D. Howard, R.D. Lisman.
Fort Lauderdale, FL. May 3 to May 7, 2009

Evaluation of the Canalicular System and Lacrimal Sac: An Anatomic Study.
American Society of Ophthalmic Plastic and Reconstructive Surgery (ASOPRS) Fall Scientific Symposium
Jeffrey M. Joseph MD, Christopher Zoumalan MD, Gary Lelli, Jr. MD, David Howard MD, Michael Kazim MD, Richard Lisman MD.
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Antibacterial Analysis of Surgical Adhesives.
American Society of Ophthalmic Plastic and Reconstructive Surgery (ASOPRS) Fall Scientific Symposium.
J.M. Joseph, A. Voldman, C.I. Zoumalan, N. Iovine, R.D. Lisman.
Chicago, Il. October 13-14, 2010.

Podcasting And Its Effect On Traditional Resident Education
Association for Research in Vision and Ophthalmology (ARVO) Annual Meeting.
J.M. Joseph, J. Young.
Fort Lauderdale, FL. May 1 to May 5, 2011

Corneal Inlay Options vs. IOL for Presbyopia: When To Do What and Can They Co-exist?

Dan B. Tran, MD
Coastal Vision Medical Group

OUTLINE:

1. Presbyopia overview

2. Introduction of FDA approved corneal inlays for presbyopia correction
    a. Optical characteristics
    b. Biochemical and tissue compatibility
    c. FDA clinical results and indications for usage
    d. Potential complications

3. Introduction of FDA approved presbyopic correcting IOLs
    a. Overview of Tecnis MF IOL, ReStor MF IOL, Crystalens/Trulign IOL
    b. Clinical outcomes
    c. Potential complications

4. Patient selection and case study illustration

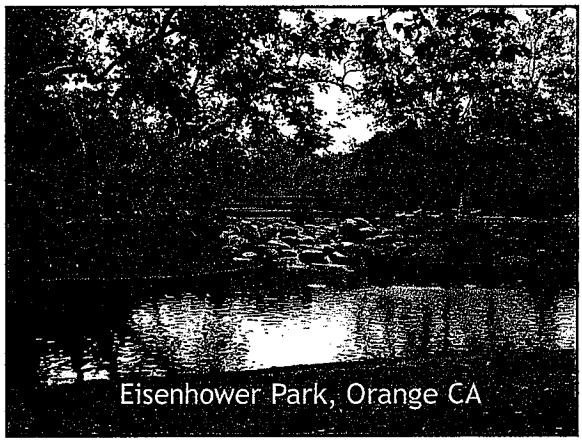
Orange County Retina Group

An Extraordinary "Retina" Tale of Great Egret Regret

Timothy Yeo, MD

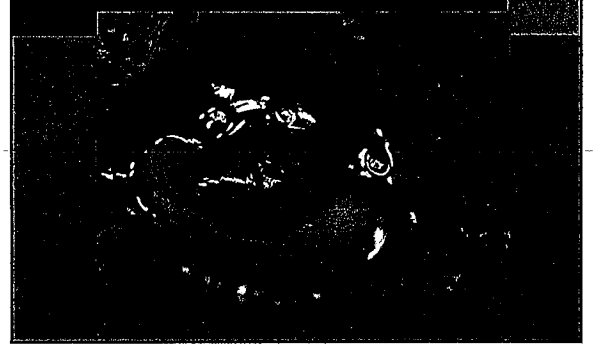
April 17, 2016

orange.county.retina



Eisenhower Park, Orange CA

History



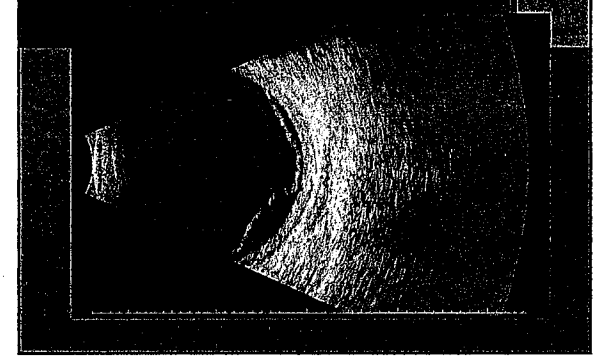
History

History of Present Illness

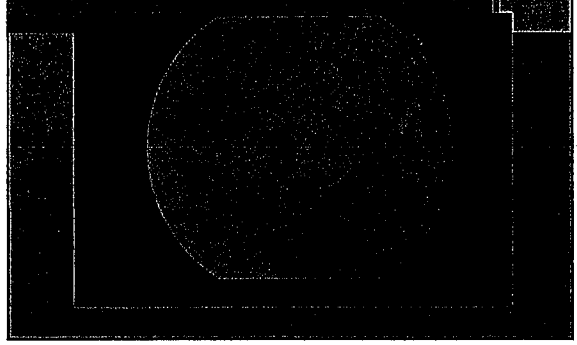
- 37 year old male developed vision loss after being attacked by Egret
- PMHx: Bipolar disorder and ADHD
- Exam Va 20/25 OD Va HM OS
- SLE: 10mm full thickness, stellate corneal laceration with proplapsed uveal tissue

Post Primary Repair Va CF 2ft

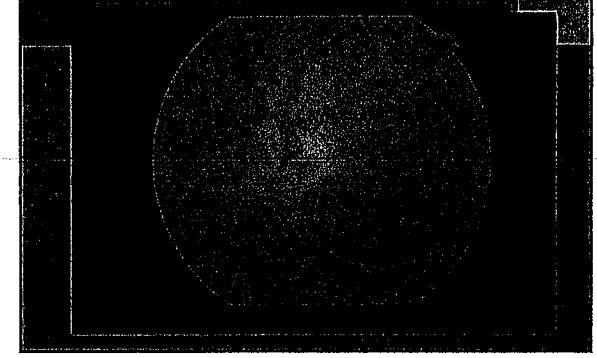
B-Scan Retinal Detachment



Fundus OD



Fundus OS



Mynah Bird

Young, A, Cheng et al. Journ Cataract & Refract Surg. 2000(9): 1419-21

Rooster

Kovach, L, et al. Subclinical endophthalmilitis J AAPOS. 2006, Dec; 10(6): 579-80
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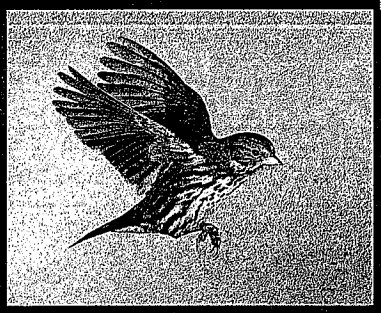
Collision with Sparrow

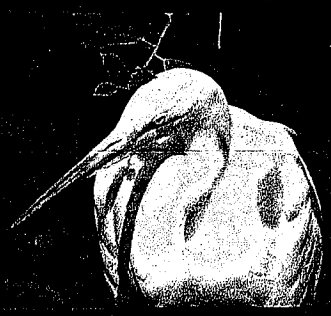


Collin, J, Ocular perforating injury by sparrow. Br Med J, 1975 (3): 520-2

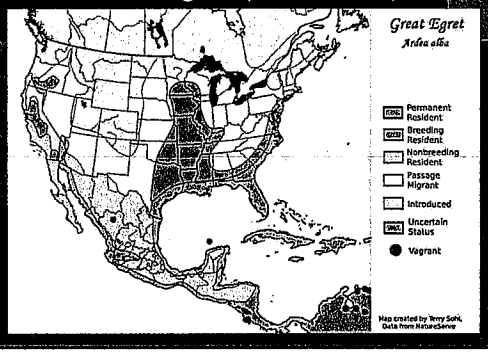
Ostrich Kick in Face

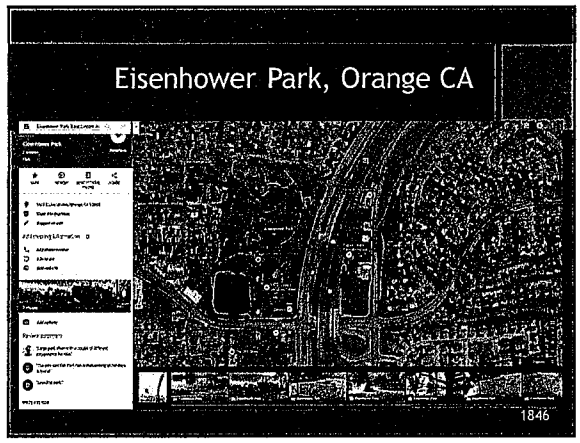
Chaudhry, I et al. Severe ocular trauma by ostrich. BJO. 2005. Feb;89(2):250-1

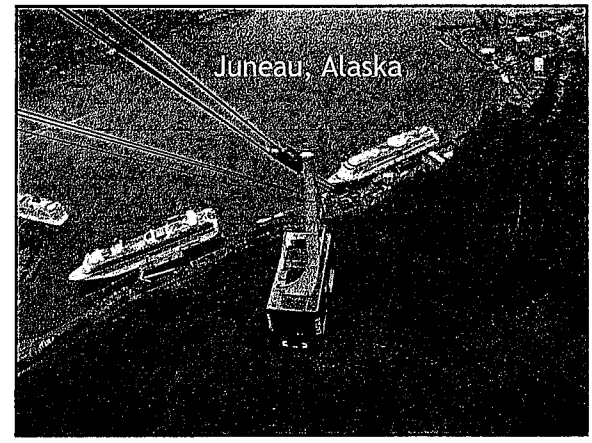
Great Egret (Ardea Alba)

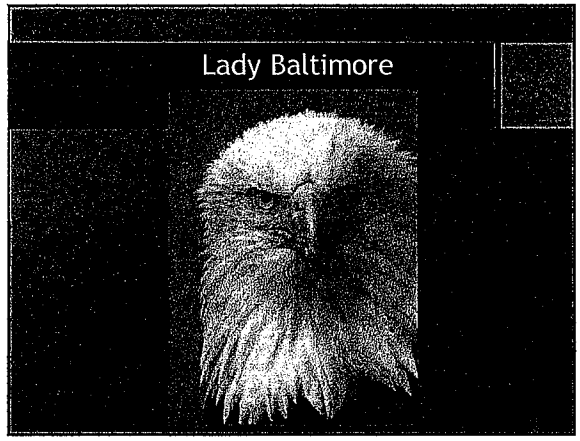


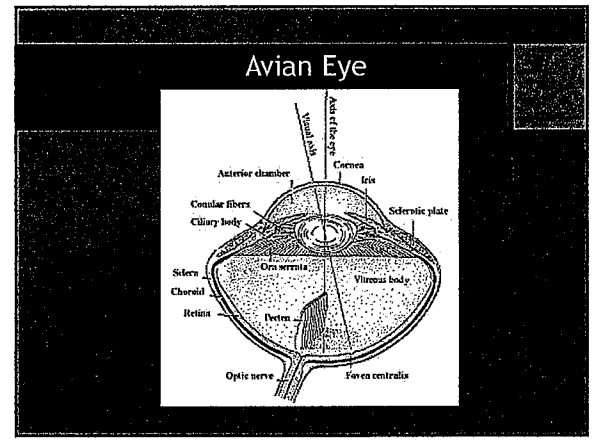
Great Egret (Ardea Alba)

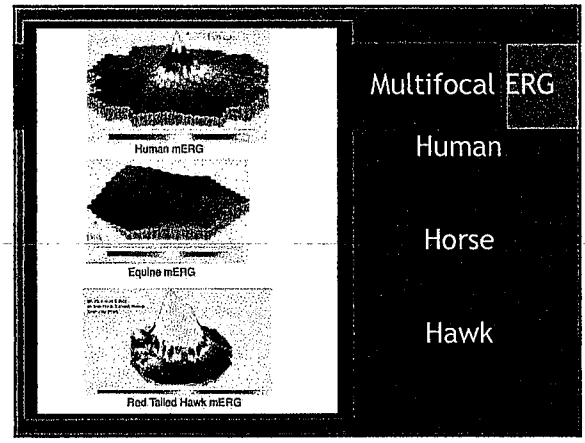


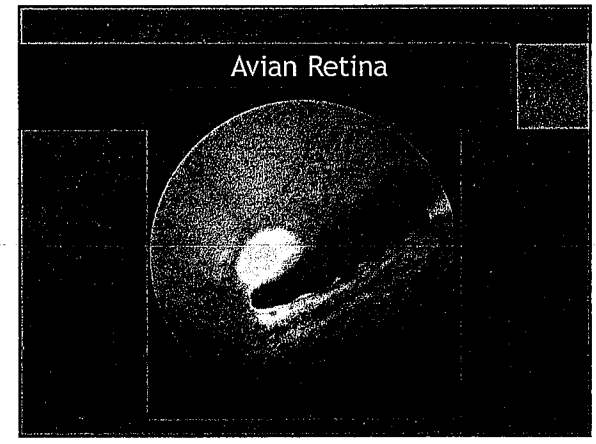

Eisenhower Park, Orange CA
1846

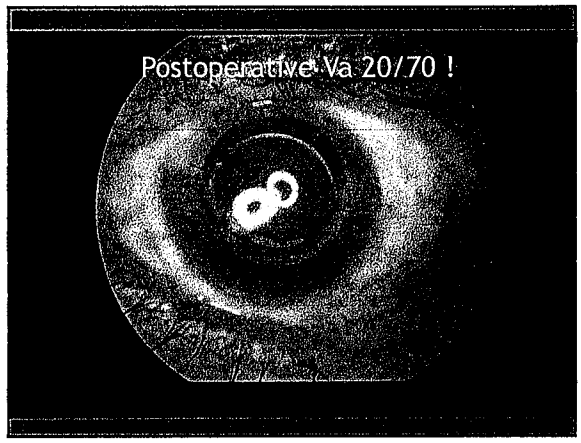

Juneau, Alaska

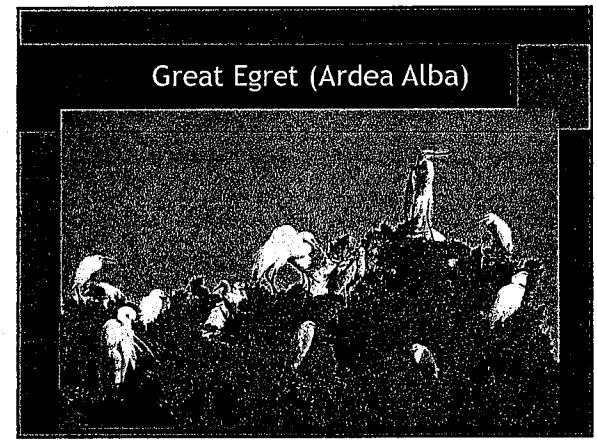

Lady Baltimore


Avian Eye
Visual axis
Axis of the eye
Cornea
Anterior chamber
Iris
Corneal fibers
Ciliary body
Scleroticc plate
Sclera
Ora serrata
Vitreous body
Choroid
Retina
Pecten
Optic nerve
Fovea centralis


Human mERG
Equine mERG
Red Tailed Hawk mERG
Multifocal ERG
Human
Horse
Hawk


Avian Retina





Orange County Retina Group

Timothy You, MD
tyou@ocretina.net

1 **Herpes Zoster: The Master Masquerader**

Lisa D. Garbutt, M.D.
Coastal Vision Medical Group

2 **Herpes Zoster**

- Varicella Zoster Virus is the causative agent of the reactivation of Herpes Zoster (shingles).
- It interacts with the nasal mucosa area as Varicella ("Chicken Pox"), then within the sensory ganglionic nerves as Zoster ("Shingles").
- Contrary to popular belief, it does not infect chickens, just humans
- Only one serotype identified
- It has many common amino acid sequences with Herpes Simplex Virus I, these striking similarities indicate a common ancestral origin

3 **Herpes Zoster in its many phases**

- Rash/Sunburn
- Blepharoconjunctivitis
- Episcleritis/Scleritis
- Dry Eye /Punctate Epithelial Keratitis
- HSV (epithelial dendritic and stromal keratitis), Endotheliitis
- Iritis/Uveitis
- Uveitic Glaucoma

4 **Herpes Zoster**

- Headache
- GCA
- Neurotrophic cornea
- Retinitis/Optic Neuritis/Oculomotor palsies
- Chronic pain syndromes, depression, "just don't feel good"

5 **Herpes Zoster Rash**

-
-
-
-
-
- Always UNILATERAL, respecting MIDLINE

6 **Blepharoconjunctivitis**

- Day 2-3 after skin rash
- Conjunctival edema/inflammation/injection, often with petechial hemorrhages
- Secondary infection of vesicles or conjunctiva can occur with Staphylococcus aureus

7 **Corneal surface**

-
-
- Punctate keratitis : Days 1-2
- Pseudodendrites: Days 4-6. "Medusa-like" epithelial defect or plaque-like formation with tapered ends. Stain with Rose Bengal or Fluorescein dye. Contain live virus.

- Corneal complications occur in approximately 65% of cases of HZO

8 **Nummular keratitis, Stromal Keratitis**

- Nummular keratitis (1-2 weeks, 25-30% of patients) = anterior stromal keratitis/multiple granular infiltrates in areas of previous pseudodendrites. (may represent Antigen-Antibody reaction)
- Stromal Keratitis - months to years after initial episode, mid to deep stromal inflammation, +/- Edema/AC rxn/Neovascularization. (may represent delayed cell-mediated hypersensitivity rxn)
- Corneal involvement can lead to significant visual loss

9 **Neurotrophic Keratopathy**

- Months to years after initial episode, indicates neurotrophic damage, is the end result of decreased corneal sensitivity from multiple episodes of herpes zoster virus-mediated destruction (decreased lacrimation, delayed epithelial healing)
- Diffuse severe punctate corneal surface erosions
- Persistent Epithelial defects, Stromal thinning, Perforation

10 **Uveitis/Trabeculitis/Endotheliitis**

- Two weeks to years
- Inflammation and Sectoral Iris Atropy (moth-eaten appearance)
- IOP issues

11 **Retinal Manifestations**

- Acute Retinal Necrosis - Coalescent patches of retinal necrosis, Occlusive vasculitis
- Optic neuritis in patient with retinitis
- Don't forget the dilated exam

12 **Post Herpetic Neuralgia**

- Amitriptyline, Neurontin, Lyrica
- Managed long-term by Neurologist, Pain Specialist

13 **Case Report**

- 31 year old female, referred by St. Joseph ER

- 1 day of pain, erythema, light sensitivity OS
- Reports a history years ago of a "viral" infection in her left eye
- Two episodes of "shingles" as a child (on back), associated with the stress of her move from England to the United States

14 **Case Report**

- Va cc 20/60 (old glasses)
- 2+ injection, very large dendritic vs. pseudodendritic lesion just temporal to the pupil with many branches, no infiltrate, light epithelial haze, no stromal haze
- trace to bare1+ cell, no KP, IOP 13
- Retinal exam normal

15 **Case Report**

- No history of vesicular rash on her forehead ever, no forehead or scalp pain
- Dx: HZO vs. HSV keratitis, more AC cell than one would expect for HSV, lesions appeared more pseudodendritic to me although largest one I have ever seen. Patient reports prior history of "viral infection on surface of eye", she couldn't tell me what medication she was treated with. Symptoms have only been going on for 1 day. Hmmmmm.....to start steroids or to not start steroids on top of antivirals.
- Decided that since it was 10pm at night, to start Antivirals immediately, and will take look at her first thing in the morning, and we can start steroids at that time if needed, as it "declares itself"

16 **Case Report**

- Started that night Valtrex 1g PO TID, Viroptic gtt Q2 hours (prefer Zirgan gel gtt 5x/day), Vigamox gtt TID, Neurontin 300mg po TID

17 **Case Report**

- 8am Next morning: Pain is less than last night
- However, Vision has clouded over
- Va cc OS: Hand Motions
- 2++ Descemet's folds/MCE, diffuse haze, the extremely large Medusa-like pseudodendrite with many branches has broken up into many small scattered pseudodendrites
- 2+ cells, trace hypopyon, IOP 13
-

18 **Case Report**

- The Zoster has declared itself indeed : Started on aggressive steroids, Durezol gtt Q1 hour for 1 day, then Q2 hours (watch IOP), and switch to Pred Forte after 1 week. Medrol dose pak.
- Continue Valtrex 1g PO TID, Viroptic QID, Vigamox BID, Neurontin PO TID prn

19 **Case Report**

-
-
-
-
- Within 2 days, Vision was back to 20/60
- Within 1 week, at 20/40 with slowly improving stromal haze

20 **Case Report**

- Very Slow taper of topical steroids over 2 months
- Taper Oral Valtrex, Consider keeping her on maintenance dose (likely high risk of recurrence). Type A/affected by stress personality
- Va cc 20/30+2, central stroma clear with few scattered inflammatory cells

21 **Understanding Herpes Zoster**

- Although there is a vaccine against Shingles, cases of HZO are rising
- Herpes Zoster results in more than 1 million new cases in the U.S. each year, with 10-20% of those involving the trigeminal nerve.
- Incidence historically is approximately 1 in 3 overall above age 60, but rises to 1 in 2 by age 85, but interestingly the greatest number of cases occurs in people in their 50's

22 **Understanding Herpes Zoster**

- HZO/Herpes zoster is becoming more and more common, especially in younger patients - Why?
- Loss of "herd immunity": with the Varicella vaccine for children (first FDA approval 1995).
- This is the first generation of parents with kids that have never had chicken pox.
- I am more commonly seeing immunocompetent patients in their 20's, 30's and 40's with HZO

23 **Understanding Herpes Zoster**

-
-
-
- Before chicken pox vaccination, adults continued to have their immunity against shingles "boosted" because of continual exposure to the varicella virus either through their children or through the community. This continued exposure has virtually disappeared.

24 **Understanding Herpes Zoster**

- Zostavax (Merck) is a live attenuated zoster vaccine that was approved almost a decade ago to prevent shingles in immunocompetent people over the age of 60.
- Is approved by the FDA for people ages 50-59, where it reduces zoster by 70%
- Clinical trials found the vaccine reduced the risk for shingles by 51% in people between the ages of 60 and 69, and the risk for postherpetic neuralgia by 67%
- With the reduction of chicken pox in vaccinated children, we must rely more on a zoster vaccine to substitute for the immune boost that came from natural exposure to exogenous wild type virus
- Research suggests the vaccine is effective for at least 6 years, but may last longer

25 **Vaccinate in HZO??**

- There is not a consensus among ophthalmologists whether to vaccinate after an episode of HZO.
- Most do not recommend vaccination after an episode of HZO, for fear of reactivating cell-mediated inflammatory reaction against any varicella zoster DNA still in the ocular tissues, causing a reactivation of HZO.
- Some believe HZO is indicative of an immune boost similar to that induced by the

vaccine, thus the vaccine is unlikely to offer any additional protection.

26 **Vaccine**

- Still others support vaccination after an episode, as long as the shingles occurred more than 12 months previously, and there were no signs of intraocular disease.
- Thought is that it may lessen the severity of another recurrence.
- It bolsters immunity in patients where age is depleting natural immunity

27 **Why is continued immunity important??**

- Latent Varicella Zoster virus (Chicken Pox) has affected everyone over the age of 40 whether they know it or not
- As many as 25% of HZO patients will develop Post Herpetic Neuralgia
- Post herpetic neuralgia is the most common cause of suicide due to pain in people 70 years and older
- Cardiovascular ramifications: HZO results in a 4.5-fold increase in the risk of stroke, and a 1.3-fold increase in the risk of stroke in patients with zoster in other locations.
- There is a 9-fold higher risk for cancer within a year of an HZO diagnosis. (Likely correlating with decreased immunity to fight off cancer cells)

28 **V1 Distribution HZO**

- Can cause acute and/or chronic recurring anterior segment disease
- HZO typically presents as a painful, unilateral, vesicular rash, can manifest most commonly in the eye 2-4 weeks later as stromal and intraocular inflammation, trabeculitis, increased IOP
- In severe cases (mostly immuncompromised patients), can lead to acute retinal necrosis
- Chronic/recurring cases can do increasing damage to CN V, decreasing sensitivity, and can lead to severe dry eye or neurotrophic cornea

29 **HZO**

- Pseudodendrites may be seen on the epithelium and are culture and PCR positive for HZV, indicating there is live virus (chronic active infection).
- Later findings may include iris transillumination defects and poor pupil reactivity.
- The most vision threatening components long term is usually immune stromal keratitis, uveitis/endothelial keratitis, and significant neurotrophic changes, which can be recurrent and progressive.

30 **HZO**

- One of the most feared long term consequences is PHN, which may occur permanently in up to 25%, varies in severity, and can be incredibly debilitating

31 **Treatment**

- Within 72 hours of the shingles rash, oral antivirals should be prescribed
- Valacyclovir 1g PO Q8 hours (TID) for 7 days, Famciclovir 500mg TID for 7 days, or Acyclovir 800mg /5x daily for 7 days (acyclovir has been shown to be less effective).
- +/- Oral steroids. HZO patients will need topical steroids, likely indefinitely
- Erythromycin ointment for vesicular lesions, or oral antibiotics if any secondary bacterial cellulitis of open skin lesions

32 **HZO Treatment**

- Start frequency of steroids based on amount of stromal involvement or anterior

chamber reaction; usually Q2 hours to QID to start, tapering very slowly over weeks.

- Some patients require 1 drop/week of steroid indefinitely
- PHN: Longer term neuropathic pain medication

33 **Giant Cell Arteritis**

- In recent studies (2013-2015), VZV has been implicated in triggering the inflammation associated with GCA, with GCA now being thought of as a VZV vasculopathy of the temporal artery
- Thus, Antiviral treatment may confer additional benefit to patients with GCA treated with corticosteroids
- One study by Gilden et al (Neurology. 2015 May), 61 out of 82 (74%) of temporal arteries pathologically positive for GCA were also positive for VZV antigen, compared with 1/13 (8%) of normal temporal artery biopsies

34 **Future Trends for Treatment**

- Treatment to enhance Immune system function. Instead of going after just the virus, enhance immune system function to control and prevent recurrence (like with newer cancer treatments).
- VZV in turn is now also being used in numerous studies as a vector for gene therapy and cancer therapy. The VZV viral medium is used to insert "suicide genes" into tumor cells.

35 **Questions?**

- The End

Cataract in the Glaucoma patient: What IOL should I choose ?

Betsy Nguyen, MD
Coastal Vision Medical Group

- Cases presented to demonstrate options and considerations in glaucoma patients with co-existing cararacts

- patient with glaucoma suspect and cataract --- options: monofocal vs toric vs vs monovision vs crystalens or trulign vs multifocal

- patient with early glaucoma and cataract: options of iol-- Avoid multifocal ? consider Istent?

-patient with mod and advanced glaucoma and cataract: options of iol-- Avoid multifocal ? consider Istent? ? trabeculectomy ?

1 **Age-Related Macular Degeneration**
John Hwang, MD, MBA

2 **John Hwang, MD, MBA**
-
- MD: Columbia University
-
- MBA: Columbia Business School
-
- Eye Residency: Columbia University
-
- Retina Fellowship: Doheny Eye Institute (USC)
-

3 **Retina Associates of Orange County**
www.retinaorangecounty.com
Newport Beach, Laguna Hills, Santa Ana

4 **Agenda**
1. What is AMD?

5 **Agenda**
1. What is AMD?

6 **What is Macular Degeneration (AMD)?**
- Central vision loss and legal blindness
-
- #1 cause of severe vision loss in older adults
  -
- 2 million have advanced AMD; another 8 million are at risk in US

7 **What is Macular Degeneration (AMD)?**
-
- Gradually destroys macula
-
- Central vision loss
-
- Peripheral vision preserved

8 **What are the Symptoms of AMD?**

9 **Agenda**
1. What is AMD?

10 **Who gets AMD?**
- Risk factors
  - Age
  - Smoking
  - Race
  - Family history

- Lifestyle
-
•

11 **Age and AMD Risk**

- Age-related macular degeneration
  - #1 risk factor
•
- Risk increases with age
  - 50s: 2% prevalence
  - 66-74 yrs: 10% prevalence
  - 75 and older: 30% prevalence
-
- #1 cause of severe vision loss in older adults

12 **Race and AMD Risk**

- Higher risk of AMD in Caucasians compared to African Americans
•
- Asians and Hispanics are medium risk

13 **Smoking and AMD Risk**

- Increased risk by 2-4X
-
- Most important modifiable factor
  - Reduced risk in 1st year of quitting
    •
    •

14 **Family History and AMD Risk**

- Family history in 20% of pts with AMD
-
- 2-3X higher risk of AMD if first-degree relative with AMD
-
- 4X higher risk of AMD if first-degree relative with advanced AMD

15 **Lifestyle and AMD Risk**

- General health
  - Normal blood pressure
  - Good cholesterol levels
-
- Healthy diet
  - Green, leafy vegetables
  - Fish
-
- Exercising
•
- Sunglasses

16 **Agenda**

1. What is AMD?

17 **What is Macular Degeneration (AMD)?**

1 • "Better" form
- Slowly progressive
- 10% of vision loss
- Light-sensitive cells in macula slowly break down

2 • "Worse" form
- Rapidly progressive
- 90% of vision loss
- New blood vessels under the macula leak blood and fluid

18 **Dry Macular Degeneration**

19 **Wet Macular Degeneration**

20 **Agenda**

1. What is AMD?

21 **How is AMD Diagnosed?**

- Dilated eye examination
-
- Specialized testing
  - Fluorescein angiography
  - OCT (optical coherence tomography)
  - OCT angiography

22 **Fluorescein angiography**

- Examine retinal vasculature
-
- Steps
  - Pupil are dilated
  - Fluorescein dye injected into vein
  - Camera takes pictures as dye travels through retina

23 **Optical Coherence Tomography (OCT)**

- Cross-section image created using light waves
  - Non-invasive
  - Expensive equipment
  -
- Ultrafine macular evaluation

24 **Optical Coherence Tomography (OCT)**

- Diagnosis of AMD
  -
  -
  -
- Assess treatment response

25 **OCT Angiography**

- Noninvasive imaging of retinal vasculature

26 **Agenda**

1. What is AMD?

27 **How is wet AMD Treated?**

- Wet AMD
  - 90% of vision loss
  - Mechanism
    - New blood vessels form under macula
    - Leak blood and fluid
  -
- Treatments
  - Laser
  - Injections
  - Surgery

28 **Laser therapy for wet AMD**

- First FDA approved treatment
  - Focal laser
  - Photodynamic therapy
  -
- Largely outdated
  - Collateral damage
  - Recurrence
  - Efficacy
  -

29 **Injection therapy for wet AMD**

- Mechanism
  - Regress abnormal blood vessels
  - Anti-VEGF
  -
- Types
  - Macugen, Avastin, Lucentis, Eylea

30 **Injection therapy for wet AMD**

- Most effective therapy to date
  - Previous therapies with vision loss
  - 95% maintained vision at 1 yr
  - 40% improved at 1 yr
-
- Excellent visual outcome
  - 20/40 = driving vision
  - 66% had 20/40 or better
  - vs 15% with previous treatments at 2 yrs
-

31 **Injection therapy for wet AMD**

- Source of patient anxiety
  - Before: "Sounds terrible!"

- After: "Much better than I thought!"
-
- Commonly performed
  - Steps to ensure comfort and safety
-

32 **Injection Procedure**
- Step 1
  - Numb the eye!
  - Instill drop of proparacaine

33 **Injection Procedure**
- Step 2a
  - Numb the eye MORE!
  - Instill drop of Tetravisc
    -
- Step 2b
  - Numb the eye MORE again!
  -
- Step 2c
  - Numb the eye MORE again and again!

34 **Injection Procedure**
- Step 3
  - Clean the eye!
    - Apply Betadine
      - Ocular surface
      - Eyelashes

35 **Injection Procedure**
- Step 4
  - Open the eye!

36 **Injection Procedure**
- Step 5
  - Re-clean the eye!
    - Re-apply Betadine

37 **Injection Procedure**
- Step 6
  - Administer medication
    - Pars plana injection
    - 30 gauge needle (0.3mm)
    -
  - After injection
    - Activities
    - Artificial tears

38 **Surgery for wet AMD**
- Uncommon

- Massive submacular hemorrhage

39

- Surgery
  - Vitrectomy
  - Subretinal injection
    - t-PA clot lysis
    - 41-gauge cannula
  - 10% SF6 Gas

40 **How is AMD Treated?**

- Wet AMD
  - Laser
  - Injections
  - Surgery
  -
- Dry AMD
  - Vitamin

41 **Vitamin Therapy for dry AMD**

- Age-Related Eye Disease Study (AREDS)
  - NIH funded
  - Can multivitamins reduce risk of advanced AMD?
  - 2 part study
    - 2001 AREDS
    - 2013 AREDS2
  -
- Mechanism
  - Oxidative damage may lead to advanced AMD
    - Sunlight exposure
    - Normal metabolic processes
  - Antioxidant vitamins may reduce oxidative damage

42 **AREDS – Original Formulation**

- AREDS multivitamin
  - Vitamin C (500 mg)
  - Vitamin E (400 IU)
  - Beta-carotene (15 mg)
  - Zinc (80 mg)
  - Copper (2 mg)
  -
- 2001 Study Results
  - 25% risk reduction in progression to advanced AMD
    - For intermediate AMD, or advanced AMD in one eye (over 5 yrs)
    - No benefit for early AMD

43 **Issues Evaluated in AREDS2**

- Beta-carotene
  - Lung cancer risk for <u>current</u> smokers

2 • Eliminate beta-carotene
• Add lutein and zeaxanthin
– Green leafy vegetables may reduce AMD

44 **Issues Evaluated in AREDS2**

1 • Omega-3-fatty acids
– Dietary intake may reduce AMD
– Fish oils
–

2 • Add omega-3 fatty acids
•
•

45 **AREDS2 bottom line...**

• 25% risk reduction for advanced AMD
– 300,000 fewer patients with advanced AMD
–
• NO beta-carotene for smokers
–
• Lutein/Zeaxanthin with possible benefits
–
• Omega-3 fatty acids do NOT confer benefit

46 **AREDS2 for dry AMD**

• AREDS2 multivitamin
– Vitamin C (500 mg)
– Vitamin E (400 IU)
– Zinc (80 mg)
– Copper (2 mg)
– Lutein (10 mg)
– Zeaxanthin (2 mg)
•
• 25% risk reduction in progression to advanced AMD
  • For intermediate AMD, or advanced AMD in one eye (over 5 yrs)
  • No benefit for early AMD

47 **What to do?**

• Routine eye examinations
– Dilated exams for age ≥ 50
– Early diagnosis can prevents vision loss
–
• Stop smoking
–
• Lifestyle
– Diet: low-fat diet, leafy green vegetables
– Optimize BP and cholesterol
– Sunglasses
•

- AREDS2 supplement if intermediate or advanced AMD
  - Other supplements claiming benefit should be taken with caution
-

48 **Age-Related Macular Degeneration**

John Hwang, MD, MBA

49

50

51

52 **Vitamin Therapy for AMD**

1
- Zinc
  - Stomach upset
  - UTI and BPH risk
  - Stress incontinence

2
- Reduce zinc
  -
  -
  -
-
-

53 **Future of AMD Treatments**

- RetinoStat® (Oxford Biomedica)
  - Phase I, gene therapy for wet AMD
-
- embryonic stem cell-derived RPE therapy (Advanced Cell Technology)
  - Phase I/II, dry AMD, transplants of RPE cells
-
- Encapsulated Cell Technology (Neurotech)
  - Phase II, dry AMD, capsule implanted into the eye, contains cells producing Ciliary Neurotrophic Factor (CNTF), a photoreceptors and preserving protein
- Fenretinide (ReVision Therapeutics)
  - Phase II trial, dry and wet AMD
  - reduced toxin accumulation in retina associated with AMD
-
- iSONEP (Lpath and Pfizer)
  - Phase II trial, wet AMD
  - antibody against Sphingosine 1 Phosphate (S1P) resulting in anti-fibrosis and anti-inflammatory effect

54 **Adaptive Devices for Low Vision**

- Handheld magnifiers
- Video magnifiers

- Computers with large-print and speech-output systems
- Large-print reading materials
- Reading glasses with high-powered lenses
- Talking watches, clocks, and calculators
- Telescopic lens implant
-
-

55 **Implantable Miniature Telescope**

- Provides enlarged retinal image
  - image over 55°of the retina, versus the 5° by natural lens
  - retains 20°–24° field of view
  -
- Visual outcome (at 12-months)
  - 90% gained two or more lines; 67% gained three or more lines
  -
- Criteria
  - 75 years or older
  - Phakic
  - VA 20/160 to 20/800 with bilateral central scotomas due to end-stage AMD (GA or disciform)
  - No active wet AMD (no active CNV OU), and no treatment in past 6 mo

56 **Changes in Vitamin Components**

1
- Vitamin C (500 mg)
- Vitamin E (400 IU)
- Copper (2 mg)
- Zinc (80 mg)
- Beta-carotene (15 mg)
-
-

2
- Vitamin C (500 mg)
- Vitamin E (400 IU)
- Copper (2 mg)
- Zinc (80 mg)
- No beta-carotene
- Lutein (10 mg) + Zeaxanthin (2 mg)
- No Omega-3 fatty acids (1g)

57 **AREDS: Common questions**

- Who should take?
  - Intermediate AMD
  - Advanced AMD in one eye
  - No benefit in healthy adults or early dry AMD
-
- Can I take a daily multivitamin if I am taking one of the AREDS formulations?
  - Yes. The AREDS is not a substitute for a multivitamin.
  - In AREDS trial, 66% took multivitamins and AREDS formulation

- In AREDS2 trial, 90% took multivitamins
-
- What is the risk of lung cancer from taking beta-carotene?
  - AREDS2 trial excluded current smokers and those who quit <1 year
  - Despite this, lung cancers in 2% taking AREDS with beta-carotene, compared with 0.9% taking AREDS without beta-carotene
  - Across both groups, 91% who developed lung cancer were former smokers.
-

58 **Possible initiating events for Wet AMD**

- Hypoxia
- Nutrient deprivation
- Trauma to Bruch's membrane
- Infection, inflammatory response
- Oxidative stress to the retina and retinal pigment epithelium (RPE)

59 **What is a Retina Specialist?**

-
- Ophthalmologist
-
- AND specialty training focused on the retina, macula, and vitreous
  - Surgery
  - Medical treatment
-

60 **What is a Retina Specialist?**

- Medical School (4 years)
  -
- Internship (1 year)
  -
- Residency in Ophthalmology (3 years)
  -
- Fellowship in Retinal surgery and diseases (2 years)
  -
  -
-

1 **ORBITAL LUMPS AND BUMPS**

WHAT LIES BENEATH:
A LOOK AT LACRIMAL GLAND LESIONS

Madhu R. Agarwal, M.D.

NEURO
PLASTICS
STRABISMUS

Redlands- Inland Empire

2 **WHO IS DR. AGARWAL??**

- Neuro-ophthalmology
  - Cranial nerve palsies
  - Optic neuropathies
  - Brain tumors
- Ocular plastics
  - Lid lesions—Skin cancer
  - Ptosis
  - Orbital tumors
- Adult Strabismus

3 **AC**

- 64 year-old African-American female with swelling of right upper lid for past 10 days
- Already attempted warm compresses and Keflex.
- PMH: Hypertension

4 **EXAM**

- 20/30, 20/25

-
- Significant ptosis of the right upper lid
- PF 2, 6
- LF 14, 18
-
- Firm, palpable mass over entire right lid crease

5

6 **CT SCAN**

7 **PATHOLOGY**

8 **ORBITAL SARCOID**

- Autoimmune disease of multiorgan granulomas
  - Pulmonary disease
  - Hilar lymphadenopathy
  - Skin, Eye, Joint Disease
-
- 30% sarcoid cases are extrapulmonary
-

- Uveitis; lacrimal gland involvement.
-
- Some cases
  - Conjunctival granulomas
  - Optic nerve involvement
  - Extraocular muscle involvement
  -
  -

9

10 **BILATERAL LACRIMAL GLAND DISEASE**

- Last Month *Ophthalmology:*
-
  - 90 cases of bilateral lacrimal gland masses
  -
  - 51 Inflammatory: IOIS, Sarcoid
  -
  - 19 Lymproliferative
  -
  - 20 Structural- prolapse
  -
  - 7 Uncommon- Rosai, Erdheim..

11 **DJ**

-
- 54-year-old male with one year history of right-sided proptosis.
-

- Painless, progressing
-
-

12

- PMH: Thyroid disease
  Hypertension
  Hyperlipidemia

Unremarkable ROS, Surgical history, Family Hx

13

- 20/20 OU
-
- 3mm right-sided proptosis
-
- Palpable mass through temporal aspect of lid
-
- Full motility and normal anterior and posterior segments otherwise

14

15 **CT SCAN**

16 **PATHOLOGY**

17 **MALTOMA**

- Low Grade Bcell Lymphoma of Mucosa- Associated Lymphoid Tissue
- Third most common type of Non Hodgkins Lymphoma
- M=F
- Usually in 50's
- Usually treated with radiation and/or chemotherapy
-

18

- DJ - no radiation but CVP-R chemotherapy x 6 mo

- CD 20 positivity of tissue-
-
- Started Rituxan - Improved outcomes if CD20+
-
- Discontinued Vincristine due to paresthesias
-
- Correlation with Chlamydia psittaci- Italian studies
  Patients treated with doxycycline- closely monitor

19

20 **TJ**

- 67-year-old Caucasian male with 6 mm of left proptosis and vision loss over one

year.
- Followed since 2009 for glaucoma. Had SLT
-
- ROS: Arthralgias
- PMH: DM, HTN, Hyperlipidemia, Graves disease, Atrial fibrillation, morbid obesity
- Meds: Too many

21 **EXAM**
- PSH: Hemorrhoids
-

Exam: OD 20/40; OS LP

6 mm left-sided proptosis
Keratinized chemosis

22

23 **OPTIC ATROPHY AND CUPPING**

24

25 **PATHOLOGY**

26 **IDIOPATHIC ORBITAL INFLAMMATORY SYNDROME**
-
- IMAGING WORKUP
-
- SURGICAL BIOPSY
-
-
-
-
- STEROIDS
- RADIATION
- CYTOTOXIC AGENTS
- IMMUNE-MEDIATED
-

27

28 **IDIOPATHIC ORBITAL INFLAMMATORY SYNDROME**
- IgG4- Related Disease
- Majority are middle-aged, older males
- Elevated serum IgG4
-

Main findings:
Autoimmune Pancreatitis

Retroperitoneal Fibrosis
Sclerosing Sialadenitis
Orbital Disease---??MALToma

Multi-organ involvement - Check the tissue and serum

Obtain CT CAP and UA!

29 **WOULD LOVE QUESTIONS!**

Madhu Agarwal, MD.
Newport Beach (949)441-5058
Redlands – Inland Empire (909)792-6000

NEURO-PLASTICS-STRAB
www.myeyelidsurgeon.com

1 **Duane Syndrome**

Golareh Fazilat, MD
Pediatric Ophthalmologist
Children's Eye Center of Orange County

2 **Over view**

- Duane retraction syndrome
- Described by Heuck in 1879
- 1905 Duane published a paper of 54 cases
- Congenital
- Non-progressive
-

3 **Epidemiology**

- Prevalence is 1-4%
- 60% girls
- 40% boys
- 80% unilateral
  - Usually left eye
- 15-20% bilateral
  - Asymmetric
-

4 **Overview**

- 30% Associated with other disorders
  - Malformation of skeleton, ear, eye, kidneys, and nervous system
- 70% Not associated with any other disorders
- Anatomical changes
  - Fibrotic LR or MR
  - Anomalous insertions
  - Bifid LR
  - Hypoplastic LR
-
-

5 **Overview**

- Misinnervation of medial and lateral rectus muscle.
- Agenesis of abducens nerve (CN6)
- Abnormal innervations of CN3
  - Inferior division of oculomotor nerve split
  - Innervates both medial and lateral rectus muscles
- Disturbance during the embryonic development
  - Between 3-8 weeks of pregnancy
-

6

7 **Overview**

- 90% have no family history
  - Bilateral in cases with family history
- CHN1 gene associated with familial isolated DS
- Recessive and dominant cases
- Chromosome location is unknown
- Multiple chromosomes
  - 2,4,8,22

8 **General Characteristics**

- Strabismus
- Head posture/ head turn
  - Eso-Duane- towards the affected eye
  - Exo-Duane- away from the affected eye

9

10 **General Characteristics**

- Amblyopia
  - 10%
  - Bilateral Duane
- Narrowing of the fissures in adduction
  - Affected eye (smaller eye)
- Globe retraction
- Enophthalmos
- Upshoot and downshoot in adducted position
-

11 **Classifications**

- Heuber in 1970
- Type I
- Type II
- Type III

12 **Type I**

- 78% of all cases
- CN 3 innervates mostly the MR muscle
  - MR>LR
- Abduction defect
- Esotropia
- Head turn to the affected side
- Narrowing of the fissures in adduction
- Widening of the fissure in abduction
- Globe retraction in adduction
- Upshoot and downshoot in adduction

13

14

15 **Type II**

- 7% of all the cases
- Part of CN 6 and CN 3 innervate lateral rectus
- Adduction defect
- Narrowing of the fissures in adduction
- Globe retraction in adduction

16

17

18 **Type III**

- 15% of all the cases
- Split of CN 3 to both LR and MR
  - No significant head turn
    - LR=MR
  - Face turn towards the opposite site of Duane's eye
    - LR>MR
    - XT
- Both adduction and abduction defect
- Narrowing of the fissures in adduction
- Globe retraction in adduction

19

20 **Type IV**

- Rare form
- Synergistic divergence
- Most of CN 3 aberrantly innervates lateral rectus
- Paradoxical abduction on the adduction attempt
  - Right synergistic divergence will have large exotropia on left gaze

21 **Subgroups**

- Subgroup A: esotropia
- Subgroup B: exotropia
- Subgroup C: orthotropia

22 **Upshoot and Downshoot**

- Adduction
- Alan Scott in 1976
  - Strong, inappropriate firing of the LR in adduction
    - Leash effect
    - Up or down after horizontal plane

-
-
-

23 **Upshoot and Downshoot**

- Usually seen in type II and III

- EMG studies by Scott and Wong
  - Vertical muscles aberrantly innervated by CN 3
  - Coexisting oblique muscle dysfunction
-

24

25 **Differential diagnosis**

- Eso-Duane
  - Congenital 6th nerve palsy
    - Absence of retraction
    - Larger ET
    - No vertical anomalous movement
- Exo-Duane
  - 3rd nerve palsy
    - Absence of retraction
    - No vertical anomalous movement
-

26 **Management**

- Non-surgical treatment
  - Amblyopia treatment
  - Prism glasses
- Surgical treatment

27 **Surgical Evaluation**

- Significant misalignment in primary
- Abnormal head position
- Narrowing of palpebral fissure due to retraction
- Significant upshoot and downshoot
- Recurrent or intractable amblyopia

28 **Surgery**

- Goal:
  - Reduce head turn
  - Reduce or eliminate strabismus in primary position
  - Maintain the largest binocular visual field
-

29 **Surgery**

- Around age 3-8
- Good fusion
- Resection surgery is avoided

30 **Surgery**

- Esotropia
  - Ipsilateral face turn
  - Ipsilateral MR recession
- Exotropia

- Contralateral face turn
- Ipsilateral LR recession
- Consider Y split procedure with LR recession for upshoot or downshoot

31

32 **Surgery**

- Globe retraction
- Recession of both ipsilateral MR and LR
- Orthotropic: recession MR=LR
- Esotropic: recession MR>LR
- Exotropic: recession LR>MR

33 **Surgery**

- Upshoot and downshoot
- Y-splitting with recession of rectus muscle
  - DRS Type III with XT
    - Y-splitting with recession of LR
  - DRS orthotropic
    - Recess ipsilateral MR and recession and Y-split of ipsilateral LR
- Posterior fixation suture (Faden) of the LR and recession of horizontal rectus muscle

34 **Surgery**

- Vertical rectus transposition procedures

35 **Conclusion**

- Congenital and non progressive
- Type I: Abduction defect
- Type II: Adduction defect
- Type III: Both Abduction and Adduction defect
- Amblyopia treatment
- Surgical treatment

1 **Refractive Surgery Advances: Contura Vision Topography Driven Treatment A Paradigm Shift in Custom Refractive Surgery**

DAVID J. SCHANZLIN, MD

2 **Disclosures**

▶DJS – None

3 **Goals for this Discussion**

▶To highlight the difference between Topography-guided treatments and other custom offers.

▶

- To share the WaveLight® FDA experiences with Contoura
-

▶To discuss what you can possible do to meet patient expectations using Topography

4 **Advances in Corneal Topography and Surgical Applications**

5 **What is new in corneal topography?**

- NEW DEVICES
- NEW METHODS
- INCREASE PROCEDURES
- MULTI-FUNCTIONALITY
- TEAR FILM
- BACK SURFACE ASTIGMATISM
- TOPOGRAPHY GUIDED

6 **Key Factors Driving Topography Use and Development**

▶Higher patient expectations and new refractive surgical technologies are driving diagnostic development

▶More precise procedures demand more precise data input

▶Cataract toric IOL market increasing

▶Estimated >30% of cataract patients have 1.0D+ astigmatism

▶New toric IOLs – expanded range B&L Trulign™ Toric, AMO Tecnis® Toric

▶Femtosecond laser LRI and cataract incisions, refining SIA influence, bimanual phaco

▶

7 **Key Factors Driving Topography Use and Development**

▶Surgical guidance systems using diagnostic inputs

▶TrueVision 3D, CALLISTO® eye

▶Increasing interest in corneal crosslinking utilizing topography diagnostics

▶Keratoconus treatments in US clinical trials

▶Post-refractive treatments

▶Intrastromal crosslinking early research

▶Corneal presbyopic inlays in US clinical trials
▶Positioning and postoperative topography analysis

8 **Multifunction Topography Devices**

▶New growth areas in tear analysis, meibomian gland dysfunction (MGD) therapy

▶Eye Health Statistics at a Glance AAO 4/1/11 website – Largest Patient Segment within Eye Care Practices. 4.88 million Americans suffer from Dry Eye. They spend billions per year in the U.S. on symptom relief. Many sufferers are over the age of 50 in the U.S. alone."

▶

9 **Corneal Topography Methods**

▶Placido disk reflection
▶WaveLight® Topolyzer, OCULUS Keratograph 5M, ZEISS ATLAS, Nidek OPD-Scan III

▶Slit-scanning
▶B&L Orbscan

▶Scheimpflug imaging
▶OCULUS Pentacam®, Ziemer GALILEI™

▶Color LED point source ray tracing
▶i-Optics Cassini

10 **Surgical Application of Corneal Topography**

▶Many methods with individual strengths
▶Placido, slit-scanning, Scheimpflug, monochromatic and color LED topography

▶Challenge is to provide more accurate data going into corneal ablation planning

▶Goal is to reduce the number of variables going into surgical planning, which drives more accurate outcomes for patients and reduced outliers in a surgeon's data set

▶

11

12

MATHEMATICAL RECONSTRUCTION
BASICS REVIEW

13 **What devices are used for various mathematical reconstructions?**

14 **What is Wavefront Sensing?**

Method for Mapping the Refractive and Aberration Profile of the Eye

15 **Aberrations at Retinal Plane**

16 **Wavefront Components**

17

18

19 **Clinical Symptoms Correlate with Convolved Aberrations?**

20 **PROBLEMS WITH WAVEFRONT MEASUREMENT**

- ▶Pupil dependent
- ▶Accommodative variation
- ▶Dependent on adequate tear film
- ▶Measures whole eye - vitreous, post lens, lens, ant. lens, aqueous, cornea, tear film
- ▶Most aberrations have minimal impact on visual performance, may increase
- ▶Monchromatic – does not account for chromatic aberrations

21 **Topo Driven Laser Refractive Surgery**

- ▶Elevation Map topography
- ▶Determine desired post op sphere, asphericity
- ▶Calculate laser pattern to reach desired shape.

22 **Why Consider Wavefront Optimized® Ablation Instead of wavefront-guided in Myopic Femto-LASIK Eyes?**

23 **"Wavefront-Optimized®"**

24 **Wavefront Optimized® Potential Benefit**

- ▶Wavefront Optimized® = Designed to minimize the induction of spherical aberration by:
  - ▶Pre-compensating for the induction of SA
  - ▶Maintaining the corneal asphericity

Wavefront - Optimized® compensates for the loss of laser ablation efficiency in the mid-periphery

25 **Results analysis**

- ▶In 83% of eyes with < 0.3 µm pre-op RMS HOAs:
  No difference in post operative Wavefront errors
- ▶In eyes with > 0.3 µm pre-op RMS HOAs:
  wavefont-guided showed less post op RMS HOAs than Wavefront Optimized®

26 **September 27, 2013 FDA Approval for T-CAT LASIK for Myopia and Myopic Astigmatism**

- ▶FDA Public Information Page for T-CAT states:
  - ▶The ALLEGRETTO WAVE® EYE-Q laser system is approved for use in performing

Topography-guided LASIK treatments in patients who have nearsightedness with or without astigmatism. You would be a good candidate for Topography-guided LASIK if you are 18 years of age or older and your vision is:

- ▶Up to -8.0 diopters of nearsightedness, or
- ▶Up to -3.0 diopters of astigmatism, or
- ▶Up to -9.0 diopters nearsightedness with astigmatism; and,
- ▶The amount of nearsightedness with or without astigmatism in your eye did not change by more than 0.5 diopters during the year before your preoperative examination.

27 **U.S. T-CAT Phase III Study**

- ▶Topography-based custom ablation
- ▶Primary LASIK in healthy eyes with myopia and hyperopia with or without astigmatism
- ▶ALLEGRETTO WAVE® Eye-Q 400 Hz laser system

28 **T-CAT Required Equipment**

- ▶The three devices that are used to plan and perform the topography-guided LASIK treatments are the:
  - ▶ALLEGRETTO WAVE EYE-Q® Laser System
  - ▶ALLEGRO Topolyzer topography system
  - ▶T-CAT software for treatment planning

29 **Topographic Guided LASIK**

WaveLight® U.S. T-CAT Study

30 **Methods**

- ▶Prospective, IRB-approved, non-randomized, multicenter study for FDA PMA submission
- ▶Topography-guided custom LASIK
  - ▶Refractive correction based on preoperative MR
  - ▶Correction of HOA and adjustment of asphericity based on topography
  - ▶LASIK flap creation using available approved femtosecond lasers or microkeratome
- ▶9 investigational sites in the U.S.

31 **T-CAT Study Investigators Group**

- ▶William Bond, MD
- ▶Ben Chotiner, MD
- ▶Dan Durrie, MD
- ▶Mickey Gordon, MD
- ▶Albert Milauskas , MD
- ▶Charlie Moore, MD
- ▶Brad Randleman, MD
- ▶Steve Slade, MD
- ▶Karl Stonecipher, MD
- ▶Jonathan Woolfson, MD

- Medical Monitor: R. Doyle Stulting, MD, PhD
- Study Management: CRC, Inc./Barbara Fant, PharmD

32 **Key Objectives of the Study**
- Safety Criteria
  - Changes in Best Spectacle Corrected Visual Acuity
  - Incidence of Adverse Events
  - Induced Manifest Refractive Astigmatism
- Effectiveness Criteria
  - Refractive Predictability
  - Visual Acuity
  - Refractive Stability
- No retreatments were performed in the study

33 **Study Design and Methods**
- Study Enrollment - Myopia Cohort
  - Up to 250 myopic eyes with/without astigmatism
    - Up to -9.00 D sphere
    - Up to -6.00 D cylinder
    - Up to -9.00 D MRSE
-
- Final Enrollment
  - Myopia 249 eyes (212 subjects)
-

34 **Patient Demographics**

35 **Enrollment Demographics**

36 **Patient Demographics and Accountability**
- Mean patient age 34 years (18 – 65)
- Accountability was excellent at each study visit, ranging from 95-100%. The accountability at the 12-month final visit was 95.0%.

37 **Summary of Refractive Outcomes – Mean Values**

38 **Summary of Refractive Outcomes within Intended Target (MRSE)**

39 **Summary of Cumulative Post-op UCVA (ETDRS)**

40 **Postop BSCVA Compared to Preop BSCVA (Change in Lines)**

41 **Postop UCVA Compared to Preop BSCVA (Change in Lines)**

42 **Wavefront Analysis Magnitude of RMS (mean), 5.0 mm**

43 **Wavefront Analysis Magnitude of RMS (mean), 5.0 mm**

44 **Pre and postop refractive maps**

45 **Preop- -2.75+.50x43- 20/30-2- ghosting**
Post op- -.75+.50x25- 20/20- 20/25 UCVA

46 **Preop - -2.75 20/20**

Post op- plano- UCVA- 20/15

47 **Pre op- -7.25+.75x60**
post op- plano- 20/20 UCVA

48 **Visual Symptoms**

49 **Visual Symptoms Questionnaire: Preop to 3M**

1 ▶Symptoms Showing *Statistically Significant Improvements*
- ▶3.6% decrease in Light Sensitivity
- ▶4.4% decrease in complaints of Difficulty Driving at Night
- ▶6.4% decrease in Reading Difficulty
- ▶2.4% reduction in complaints of Glare

2 ▶Symptoms with *No Statistically Significant Change*
- ▶Double Vision
- ▶Fluctuation in Vision
- ▶Halos
- ▶Starbursts
- ▶Dryness
- ▶Pain
- ▶Foreign Body Sensation

50 **Visual Symptoms: Preop to 3M**

1 ▶Light Sensitivity*
- ▶Difficulty Driving at Night*
- ▶Reading Difficulty*
- ▶Double Vision
- ▶Fluctuation in Vision
- ▶Glare*
- ▶Halos
- ▶Starbursts
- ▶Dryness
- ▶Pain
- ▶Foreign Body Sensation

2 ▶All categories of complaints showed a reduction in severity after the T-CAT LASIK procedure compared to baseline, except double vision and foreign body sensation, both of which had a minimal increase in severity postoperatively. The 3.6% decrease in severity of light sensitivity, 4.4% decrease in complaints of difficulty driving at night, 6.4% decrease in reading difficulty, and 2.4% reduction in glare complaints were all statistically significant improvements in the severity of these visual symptoms in the T-CAT LASIK treated eyes.

▶

51 **Visual Symptoms: Preop to 3M, n=247**

52 **Visual Symptoms: Preop to 6M, n=244**

53 **Change in Refractive Status Vision Profile (RSVP) Score**

▶Concerns Measured Using RSVP Scoring
- ▶Expectations

- ▶Physical/social functioning
- ▶Driving
- ▶Symptoms
- ▶Optical problems
- ▶Glare
- ▶Problem with corrective lenses
- ▶Total Score

▶Conclusion: Subjects who underwent T-CAT LASIK with the ALLEGRETTO WAVE® Eye-Q Excimer Laser in the clinical trial experienced an improvement in physical/social functioning, driving, visual symptoms, optical problems, and problems with corrective lenses that was evident at three months and continued to improve through 12 months postoperatively, compared to their habitual refractive correction method (glasses or contact lenses) preoperatively.

54 **Visual Symptoms Summary**

▶There was a decrease in the proportion of eyes with marked to severe ratings for light sensitivity, difficulty driving at night, reading difficulty, fluctuation in vision, glare, halos, starbursts, dryness and pain after T-CAT LASIK compared to before surgery. Statistical significance was achieved for light sensitivity, difficulty driving at night, reading difficulty and glare

▶Eye dryness was the most commonly reported visual complaint that occurred in the first 3 month postoperative period

▶98% of subjects indicated that they would have T-CAT LASIK again

▶Visual symptoms and objective visual acuity measurements generally improved with time, through the end of the study (12 months postoperatively)

55 **Contrast Sensitivity Testing (Mesopic Illumination)**

56 **Topography Use With T-CAT LASIK**

▶Topography-guided LASIK (T-CAT) is the next frontier in personalized ablation profiles. The technology behind it offers multiple benefits for both surgeons and their patients. These include:

- ▶First topography-guided treatment to receive FDA approval
- ▶Treatment incorporates refractive error of the eye and corneal irregularities into the custom laser ablation for myopia and myopic astigmatism
- ▶93% of FDA study eyes achieved 20/20 UCVA and 69% achieved 20/16 or better UCVA at 12 months
- ▶Study results showed a statistically significant improvement in visual symptoms traditionally associated with LASIK, such as glare, light sensitivity, difficulty driving at night, and reading difficulty

57 **Summary**

▶Topo Driven Laser Refractive surgery is here

▶We will be offering this to patients in early February!

Refractive surgery advances: SMILE

Dan B. Tran, MD
Coastal Vision Medical Group

OUTLINE:

1. Overview of the technology
2. FDA clinical study data presentation
3. Surgical technique illustration
4. Potential complications
5. Comparative to current LASIK technology
6. Biomechanical and corneal nerve impact on the cornea

Sanford Chen, MD

3/30/16

1 **OCT and Macular Disease**

Mastering the Basics

2 **Goal**

- To increase your ability to identify retinal pathology on OCT

3 **Paradigm Shifts in Macular Imaging**

4

5

6

7 **Outer Retinal Bands**

8

9 **Correlation of SD-OCT Bands With Anatomy**

10 **OCT Interpretation**

Quantitative and Qualitative Assessment

11 **OCT Artifacts**

- Affect both Quantitative and Qualitative analyses
- Quantitative artifacts more likely to result in incorrect management

12 **Causes of OCT Artifacts**

- Misalignment*

Segmentation errors*: Incorrect identification of retinal boundaries

Shadowing

Blink

Motion

Out of Range Error

13 **Misalignment**

- Occurs in patients with poor fixation
- Results in inaccurate mapping of Central Macular Thickness

- Look for off-center "blue spot" corresponding to misaligned foveal depression
- I start my review of OCTs by looking for evidence of misalignment

14 **Impact of Unidentified Misalignment**

- Unnecessary treatment of incorrectly diagnosed "macular edema"
- Important pattern to recognize
- Most valuable use of Macular Thickness Map

15 **Segmentation Error**

- Segmentation lines automatically drawn by software
- Inner boundary = ILM
- Outer boundary = RPE/Bruch's Membrane
- Lines guide macular thickness calculation by software

16 **OCT Boundaries Vary by Machine**

- All OCT machines use ILM as inner boundary
- Outer boundary varies:
  - Spectralis - Bruch's membrane
  - Cirrus, RTVue - 100 - OS-RPE junction
  - Topcon 3D OCT-1000, Copernicus - photoreceptor OS tips
  - Stratus (time domain) - IS/OS line (Ellipsoid Inner Segment)

17 **Segmentation Error**

Retinal pathology "confuses" the software

- VMT, ERM, scars, blood, confluent drusen, PED's

- Properly place lines may incorporate pathology that artificially increases "retinal thickness" measurement

18 **Segmentation Error**

19 **Quantitative Analysis - Segmentation Lines**

Inaccurate line placement leads to incorrect quantitative measurements

Important to recognize line errors if basing treatment decisions on these numbers

Bottom Line: Confirm accuracy of macular thickness maps with review of B-scans

20 **Qualitative Evaluation**

- Foveal depression or thickening
- Abnormal areas of hyporeflectivity
- Abnormal areas of hyperreflectivity
- Look at all scans - pathology sometimes only in a single scan

21 **Qualitative OCT Interpretation**

1. Reflectivity
2. Location
3. Shape/configuration

22 **Relative Reflectivity**

- High
  - Epiretinal scar tissue, NFL
  - Ellipsoid inner segments
  - RPE, CNV
- Moderate
  - Ganglion cell/Plexiform/ELM
  - Drusen, blood, choroid

23 **Relative Reflectivity**

24 **Relative Reflectivity**

- Low/Moderate
  - Inner/outer nuclear layers
  - Myoid inner segments
  - Choroidal vessels
- Low
  - Vitreous, retinal cysts
  - Serous PED, shadowing

25 **Vitreomacular Interface Disorders**

General Categories

1. Vitreomacular traction

26 **Common Stages of Age-related PVD**

27 **Perifoveal PVD**

Stage 1 PVD

28

29

30 **Perifoveal PVD Complications**

Vitreomacular Adhesion Size ≤ 500u

- Vitreofoveal traction + macular edema and subretinal fluid
- Inner lamellar hole
- Outer lamellar hole / photoreceptor gaps
- Full-thickness macular hole

31 **Perifoveal PVD Complications**

Vitreomacular Adhesion Size ± 1500u

- Vitreomacular traction syndrome
- Myopic traction maculopathy

32 **Vitreomacular Traction**

Variable Effects

33 **Epiretinal Membranes**

34 **PVD's Role in Development of ERM**

3 Mechanisms

- Dehiscence in ILM allowing glial cell proliferation
- Vitreoschisis leaving large outer cortex remnant on ILM after PVD
- Proliferation/transdiff. of cortical hyalocytes in small remnant

35

36

37 **Va?**

38 **Vitreofoveal Traction**

(CMT 292u)

39 **Epiretinal Membrane**

(CMT 356u)

40 **Va?**

41 **20/25**

42 **Spontaneous Release of VMT**

43 **Vitreoschisis**

44 **Macular Holes**

1. Inner lamellar macular hole
2. Outer lamellar macular hole ("gap")
3. Full-thickness macular "micro-hole"
4. Full-thickness macular hole

45 **Inner Lamellar Macular Hole**

Defined by OCT
Witkin, Duker, et al. Ophthalmology 2006

1. Irregular foveal contour
2. Break in inner retina
3. Intraretinal split
4. Intact foveal photoreceptors

46

47

48 **Photoreceptor Layer Dehiscence**

Outer Lamellar Hole

- Vitreomacular traction
- Foveal cyst
- Dehiscence of outer retina

49

50 **Macular Hole**

True Inner Retinal Operculum

51

- Began as subjective interpretation of small, red foveal lesion as a tiny hole
- OCT reveals foveal red spot associated with wide spectrum of anatomical changes

52 **Foveal Red Spots**

(Very fine ERM)

53 **Foveal Red Spots**

(Inner Lamellar Hole)

54 **Foveal Red Spots**

- Small gap in photoreceptors
  - Vit-mac traction
  - Healed macular holes

55

Challenging Refractive Surgery Cases: How to Manage Patient Outcomes with Advance Technologies

Dan B. Tran, MD
Coastal Vision Medical Group

OUTLINE:

1. Case study illustrating the application of advance refractive surgery technologies to clinical situation
    a. Aberrated cornea underwent cataract surgery
    b. Managing corneal ulcer with partial flap melt following PRK of previous LASIK patient
    c. Happy outcomes of a patient with cataract, glaucoma, astigmatism underwent lens replacement surgery with toric IOL and MIGS stents guided by ORA for toric IOL placement
    d. LASIK retreatment correcting HOA (coma) of previous LASIK patient

1 **Cataract Surgery:**
To Femto or Not To Femto?

Lisa D. Garbutt, M.D.
Coastal Vision Medical Group

2 **History**

Over the last 50 years, physicians have found ways to apply laser technology to various areas of ophthalmology

Repairing retinal tears, creating corneal flaps, glaucoma treatments

Applying this technology to cataract surgery was the next step in a natural progression

3 **Evolution**

2001: Intralase (Irvine, CA) introduces the femtosecond laser for LASIK flap creation

4 **January 2008**

•

•

Intralase founders form LenSx Lasers (Aliso Viejo, CA), the first company to produce a femtosecond laser for cataract surgery

5 **August 2009**

•

•

LenSx laser platform receives U.S. Food and Drug Administration (FDA) Approval

In 2011, Dan B. Tran, MD performed the first LenSx assisted cataract surgery in California

6 **March 2011**

FDA approves LENSAR laser (Orlando, FL) for lens fragmentation and anterior capsulotomy

7 **2015**

More than 1,000,000 laser cataract procedures performed worldwide

8 **Goals**

Increased Consistency and Predictability

Better Refractive Outcomes

Does not replace a good surgeon, but helps these surgeons attempt to achieve even better refractive results

9 **Benefits**

Spend less time inside the eye (quieter, more comfortable eyes)

50% less phacoemulsification/ultrasound energy used

Use fewer instruments, less fluid

Overall, a more elegant and gentler surgery

10 **Early skepticism**

How do you take an already consistent and highly evolved procedure and add expensive capital equipment, disrupting workflow, and adding additional steps and cost?

However, many surgeons have adopted laser cataract surgery more quickly than they adopted phacoemulsification

Patients are embracing the technology, despite its added cost, just as they did for refractive surgery

11 **Early changes "working out the kinks"**

Making small changes to the software, patient interface, and OCT image quality after each case to increase the accuracy of the laser cuts

After much trial and error, the current SoftFit interface was developed (LenSx), which provides better corneal wound structure, less postoperative conjunctival redness, and a free-floating capsulotomy in 97% of cases. (Earlier on, capsulotomy was not always complete)

12 **Importance of fine tuning the patient interface**

Better, more peripheral incisions which induce less astigmatism, better patient comfort, and less docking time

Strong, centered capsulotomies - less lens tilt with healing (less astigmatism induced), improved centration of intraocular lens (less higher order aberrations)

13 **Femtosecond cataract laser upgrades**

Real-time OCT

More sophisticated pre-op surgical planning systems

Wireless transfer of data from imaging machines to laser

Goal to make surgery easier, faster, and more precise

14 **Review of Technology**
(LENSAR)

-
-
-
- Non-Applanating Fluid Filled Interface which maintains corneal integrity:
- Contributes to precision, Allows for clean imaging
- Minimizes patient discomfort

- Minimizes increase in IOP

15 **Superior Imaging**

-
-
-
-
-
- Combined advanced technologies for depth of field advantage:
- Scheimpflug - rotating camera takes captures of 2 different angles at up to 8 different positions around the optical axis for a total of 16 images
- Variable rate scanning - ensures optimal contrast to capture all optical structures
- SLD (superluminescent diode) illumination - helps to generate an in-focus image from the anterior cornea to the posterior lens capsule

16 **Augmented Reality**

-
-
-
- Utilizes biometric data and optic ray-tracing technology to build a 3-D model of the anterior segment
- Performs Lens Tilt Detection and Compensation to make sure all treatment is within capsular bag

17 **Precise Laser Placement**

-
-
-
-
-
- Accurate clear corneal incisions
- Perfectly round capsulotomy of predictable size, increasing consistency in effective lens position which contributes to better refractive outcomes
- Efficient lens softening for less phacoemulsification energy exposure

18 **LENSAR**

Streamline software upgrade became available April 2015:
Cassini corneal shape analyzer - Transmits patient data wirelessly to the laser system
Iris Registration - integrates pre-op data into the actual procedure so surgeons do not have to use manual markings

19 **LENSAR**

Arcuate Incision Planning Table - help define the location and depth of planned arcuate incisions, based on the patient's own biometric factors.

Cataract Density Imaging - classifies the cataract based on density to a particular fragmentation pattern that would be most efficient. Surgeon can customize each pattern.

20 **LenSx**

Verion Image-Guided System - 1. Measures the cornea
2. Takes an image-guided picture of the scleral vessels and iris landmarks that can account for cyclorotation
This information is transferred to the laser, which helps orient clear corneal and AK incisions as well as TORIC IOL's in a precise and accurate fashion
Surgeon no longer has to mark the patient

21 **LenSx**

Verion Surgical Planner: Enter incision location, depth and arc length
Plan along with all patient data is transmitted wirelessly to the laser, avoiding transcription errors

22 **LenSx**

-
-
-
-
- VERION Digital Marker uses patient information and images from the VERION Reference Unit as a guide to provide accurate positioning
- Features a tracking overlay that enables surgeons to see all incisions and alignment in real time

23 **Advantages**

Less phacoemulsification energy is used
The laser can make consistently rounder capsulorrhexes (in 1.3 seconds as opposed to 20 seconds or more for a manual capsulorrhexis)
- Femtosecond laser cannot replace a skilled surgeon, but it can increase the consistency and reproducibility of an already skilled surgeon

24 **Complicated Cases Benefits**

Dense nuclei, hypermature lenses, fibrotic cataracts
Subluxated lenses, loose zonules
Pseudoexfoliation cases
Posterior polar cataracts
Fuchs' Dystrophy

25 **Disadvantages**

- COST
- Is the cost justified?
  - The consumers will decide
    - Patients
    - Surgeons
    - Referral Doctors

26 **Refractive Advantage**

27 **Questions?**

- THANK YOU!

JEFFREY JOSEPH | M.D.

OPHTHALMIC PLASTIC AND RECONSTRUCTIVE SURGERY

JEFFREY JOSEPH | M.D.

OPHTHALMIC PLASTIC AND RECONSTRUCTIVE SURGERY

EYELID AND PERIOCULAR CANCER

THE OPTOMETRIC ROLE IN DIAGNOSIS AND MANAGEMENT

April 17, 2016

Financial Disclosures

- **None to declare**

About Me

- **My Practice**
  - Exclusively dedicated to Aesthetic and Reconstructive **Oculoplastic Surgery**
  - Newport Beach, CA
- **Ophthalmic Plastic and Reconstructive Surgeon**
  - Skin Cancer and Reconstructive Surgery Center
  - Appearance Center of Newport Beach
- **Assistant Professor - UC Irvine**
  - Department of Ophthalmology
  - Gavin Herbert Eye Institute

Skin Cancer and Reconstructive Surgery Center

SCARS CENTER skin cancer specialists

Newport Beach, California

A group of **independent specialists** dedicated to the **mulitdisciplinary** treatment of skin cancers in the private practice setting.

Skin Cancer and Reconstructive Surgery Center

SCARS CENTER skin cancer specialists

Specialties

- Dermatology
- Plastic Surgery
- Dermatopathology
- Otolaryngology
- Ophthalmology
- Radiation Oncology
- Oncology
- Anesthesiology

Skin Cancer and Reconstructive Surgery Center

Treatments

- Mohs Micrographic Surgery
- Surgical Reconstruction
- Curettage and Desiccation
- Topical Chemotherapy
- Radiation Therapy
- Sentinel Lymph Node Biopsy
- Excision with Frozen Section
- Superficial Radiotherapy (SRT)
- Photodynamic Therapy (PDT)
- Skin Cancer Prevention

Background

- **From the American Optometric Association (AOA)**
- The American Optometric Association represents approximately **39,000** doctors of optometry, optometry students and paraoptometric assistants and technicians.
- Optometrists serve patients in nearly 6,500 communities across the country, and in 3,500 of those communities are the **only eye doctors.**
- Doctors of optometry provide two-thirds of all **primary eye care** in the United States.

Background

- **The ratio of optometrists to ophthalmologists in the US is approximately**

2:1

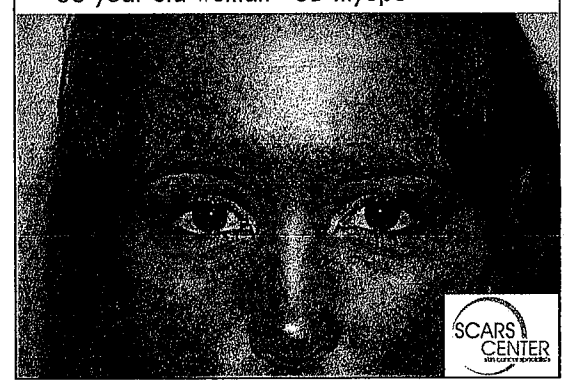
Background

- The role of evaluating or identifying eyelid-periocular lesions is shifting towards the optometrist and away from physicians (primary care-ophthalmology)

Why the optometrist?

- The unique role and skills of the optometrist
  - Primary eye care provider
    - Many people see an optometrist more frequently than an MD- especially younger patients
      - Uninsured
      - Myopia
        - In the United States, myopia has increased 66% (last 30 years)
        - 42% of people aged 12-54 are myopic.
  - Familiarity with the eye and eyelids
  - Proficiency with the microscopic-slit lamp exam

33 year old woman- -5D myope



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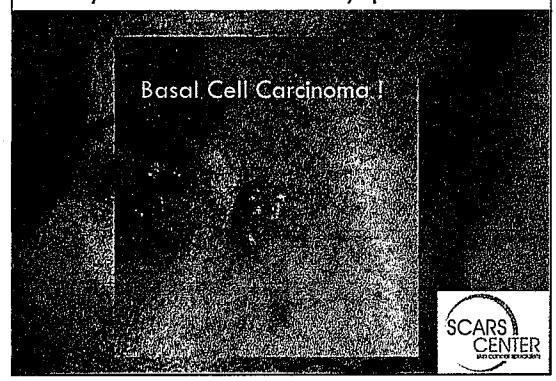

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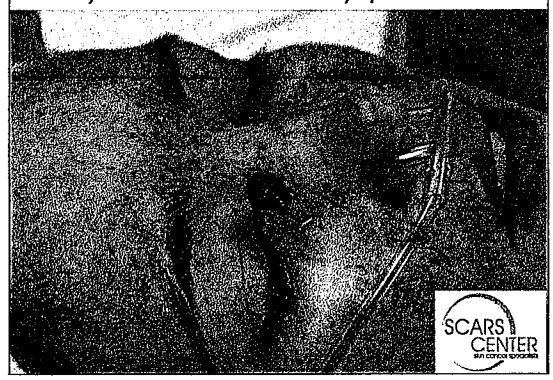

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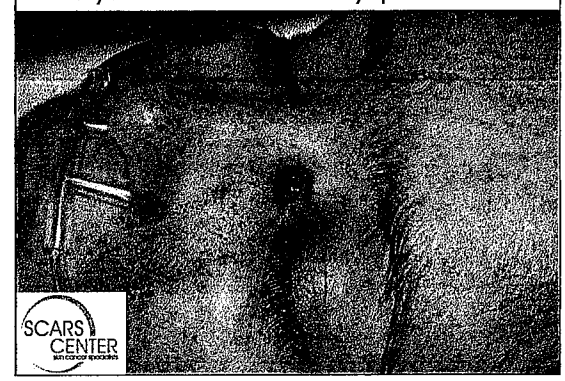

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  - Familiarity with the eye and eyelids
  - Proficiency with the microscopic-slit lamp exam

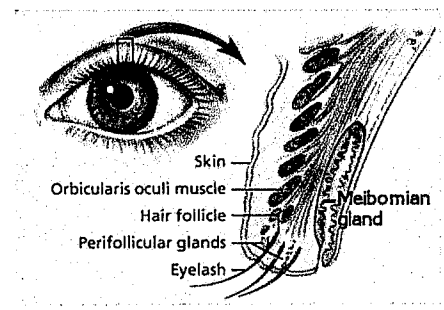
Why does it matter?

- Skin cancer incidence is increasing (most common cancer in US)
  - Aging population
  - Longer lifespan
  - Increased outdoor activities
  - ? Environmental changes
- Accurate diagnosis & management critical in achieving a cure
- Easier to treat when small in size

Why the optometrist?

- The optometric community **must embrace** this role for our population to have adequate identification and treatment of potentially malignant periocular lesions.

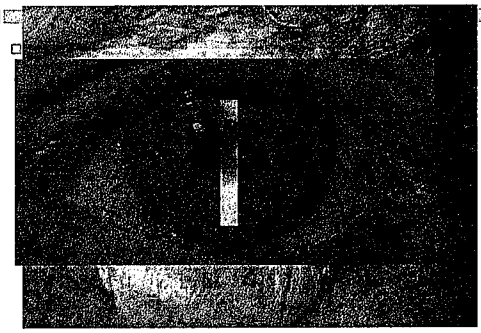
Anatomy



If you don't **think** about it, you won't **see** it!

- Clinical Evaluation
  - My philosophy
  - History
  - Examination

If you don't **think** about it, you won't **see** it!



If you don't **think** about it, you won't **see** it!

- Clinical Evaluation
  - My philosophy
    - LIGHTS ON
    - Point of view
    - Structure

    DO IT THE SAME EVERY TIME

If you don't **think** about it, you won't **see** it!

- Clinical Evaluation
  - My philosophy
  - History

HISTORY

- Description of the symptoms
- Rate of progression
- Targeted review of systems

HISTORY

- Description of the symptoms
  - Sensory: tenderness, itching, visual changes
  - Motor: ptosis, lagophthalmos
  - Structural: visible or palpable lesion, change in symmetry
  - Functional: keratopathy or tearing
  - Secondary: pigmentation, lymphadenopathy

HISTORY

- Description of the symptoms
- Rate of progression
  - Most symptoms develop over weeks to months
  - hemorrhage, infection, and inflammation may be acute.

HISTORY

- Description of the symptoms
- Rate of progression
- Targeted review of systems
  - Risk factors and history of skin malignancy
  - History of systemic malignancy

If you don't **think** about it, you won't **see** it!

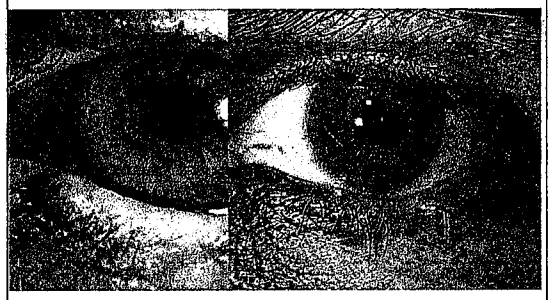
- Clinical Evaluation
  - My philosophy
  - History
  - Examination

Examination

LESION EVALUATION

1. Look
2. Feel
3. Press
4. Move
5. Transillumination
7. Measure
8. Lymph nodes

Examination



Examination

- Feel
  - Tenderness
  - Surface (smooth, irregular, nodular)
  - Edge (well-defined, indistinct)
  - Consistency (hard, firm, rubbery, spongy, soft)

Examination

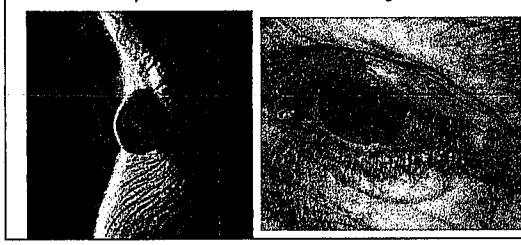
- Press
  - Pulsatility (expansile pulsation, transmitted pulsation)
  - Compressibility (disappears on pressure and reappears on release)
  - Reducibility (reappears only on application of another force, e.g., cough)
  - Fluctuation (two fingers move apart when middle area is pressed)

Examination

- Move
  - Fixation to skin or tarsus
  - Mobility (attempt to move the lump in two planes)

Examination

- Transillumination
  - indicates presence of clear fluid; may be done with the slit lamp illumination beam or a muscle light

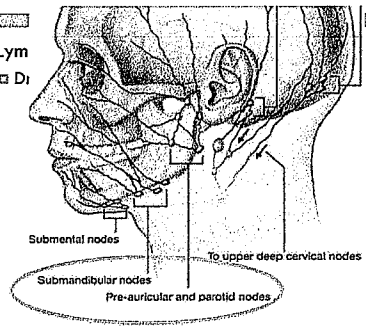


Examination

- Measure
  - Measure and draw
    - record progression
    - keep a visual impression of the lid tumor findings for subsequent evaluation
    - Photograph if able

Examination

- Lym
  - Di



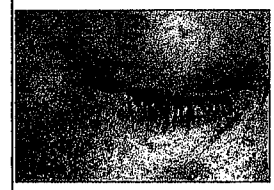
Is It Cancer?

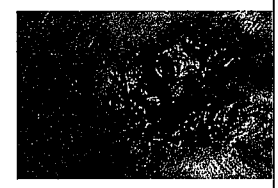
- History
  - ↑ age & history of significant sun exposure are suggestive
  - History of skin or other malignancy
  - **Lesion growth or change**
- Examination
  - Certain elements may favor a benign vs. malignant etiology
- Pattern recognition
- Clinical intuition

Concerning Features

- Size- recent onset or growth
- Color
- Borders- poorly defined with surrounding induration
- Vascularity
- Ulceration
- Loss of lashes (or misdirection)
- Disruption of normal lid or cutaneous architecture
- Signs of spread
  - Pain
  - Hyposthesia
  - Fixed to underlying structures or bone
  - Lymphadenopathy

Concerning Features





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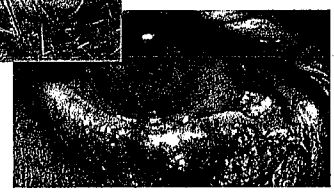

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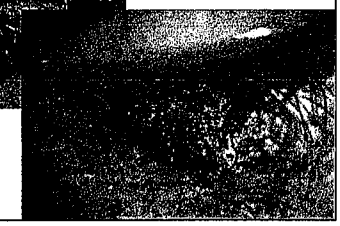


Concerning Features

Concerning Features

Periocular Cancer

- One of the most common sites for skin cancers
- 5-10% of all skin cancers
- Nonmelanoma skin cancers
  - including basal cell carcinoma and squamous cell carcinoma
  - Highest incidence rates of any cancers in the US.
- Rising incidence of melanoma
  - currently the sixth most common cancer in men
  - the seventh most common for women
  - one of only three cancers with an increasing mortality rate in men.

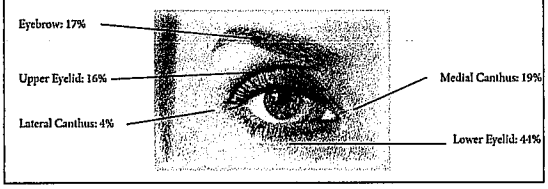
Periocular Cancer

- 1 in 55 Americans will develop melanoma
- 1 in 5 will develop skin cancer (all types)

SCARS CENTER
skin cancer specialists

SKIN CANCER AND RECONSTRUCTIVE SURGERY CENTER

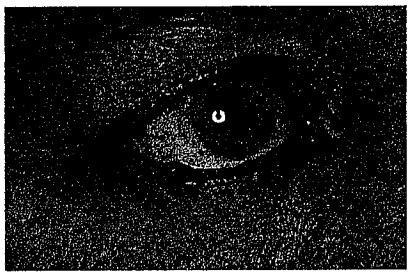
Skin Cancers of the Eyelids Account for 5 - 10% of All Skin Cancers.



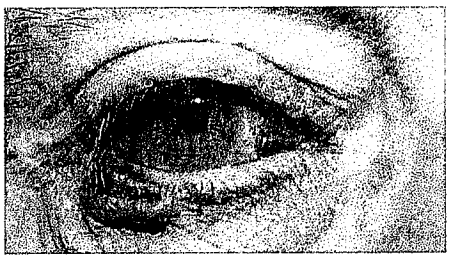
Basal Cell Carcinoma

- Waxy papule
- Telangiectasias
- Destruction of lid architecture
  - Lashes
  - Meibomian glands
  - Notch
- Rolled edges
- Ulceration

Nodular Basal Cell Carcinoma



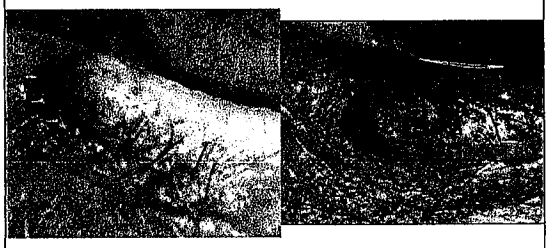
Nodular Basal Cell Carcinoma



Nodular Basal Cell Carcinoma

Nodular Basal Cell Carcinoma

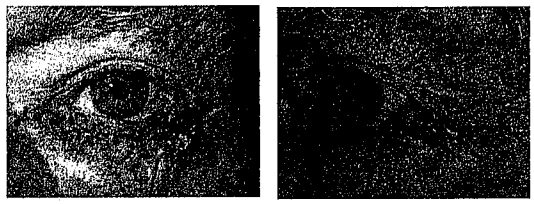
Basal Cell Carcinoma



Squamous Cell Carcinoma

- Arises in sun-damaged skin (de novo or from actinic keratosis)
- Can appear as nodule or an indurated plaque
- Local metastasis
  - Direct
  - Perineural
- Distant metastasis
  - Lymphatic

Squamous Cell Carcinoma



Squamous Cell Carcinoma

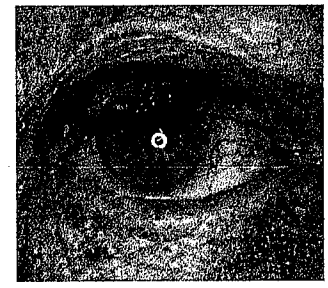
Squamous Cell Carcinoma

Melanoma

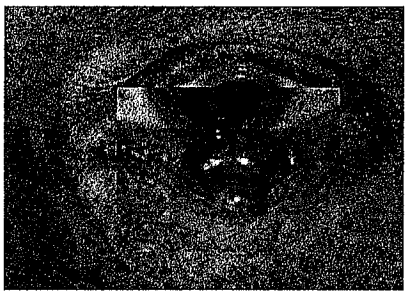
- Eyelid melanomas are rare (<1%)
- Clinical features
  - recent onset
  - change in existing lesion (uncontrolled growth)
  - Asymmetric shape (cannot "fold" on itself)
  - Borders irregular (uncontrolled growth)
  - Color change or multiple colors within lesion
  - Diameter >6mm in diameter (large lesion)

Melanoma

Melanoma



Melanoma



Melanoma

Lentigo Maligna (Melanoma in situ)

Melanoma

Lentigo Maligna (Melanoma in situ)

Non-UV Related

When do I refer?

- The simple answer: "When you think about it"
  - Worrisome features
  - Focal or unexplained issue
    - Inflammation/ ulceration
    - Trichiasis
  - Clinical intuition
  - Strong history or ROS

Where do I refer?

- Dermatologist
  - Good familiarity with monitoring of skin lesions
  - Limited experience with monitoring non-skin lid lesions
  - Variable experience/ comfort with surgical intervention on lid or near eye
- General ophthalmologist
  - Excellent comfort/ familiarity with lid and ocular surface
  - Variable familiarity/ ability with monitoring of lesions
  - Variable experience/ comfort with surgical intervention on soft tissue

Where do I refer?

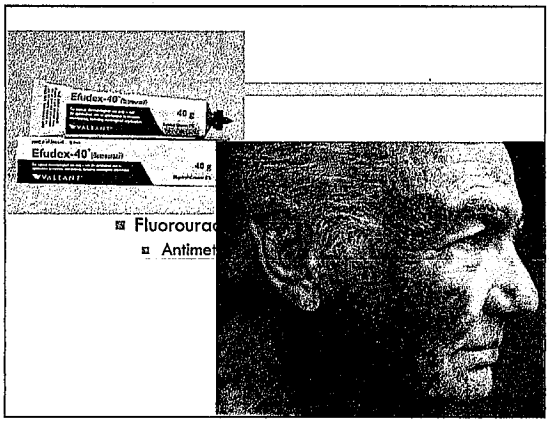
- Ophthalmic plastic surgeon
  - Good familiarity with monitoring of skin lesions
  - Extensive experience with monitoring non-skin lid lesions
  - Excellent comfort/ familiarity with lid and ocular surface
  - Photographic monitoring is a staple of the practice/EMR.
  - Specialty with most experience and training with regards to surgical intervention on lid or near eye

What I do

- Biopsy
  - I routinely biopsy any suspicious lesion
  - Done in office
  - Patients back to normal routine usually that day
  - Can place a small stent in the canaliculus if needed

What I do

- Ensuring no residual tumor
  - Frozen section
  - Mohs surgery



- Fluorourac
- Antimet

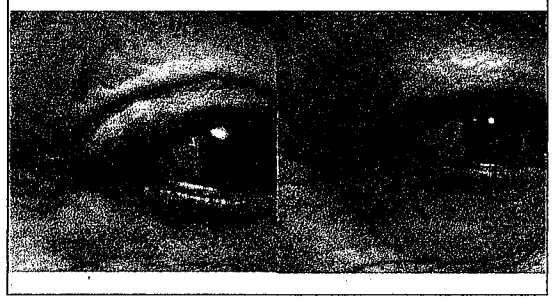
What I do

- Other options

Reconstruction

Reconstruction

Reconstruction



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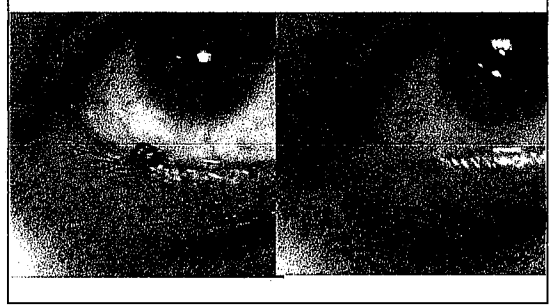

Reconstruction

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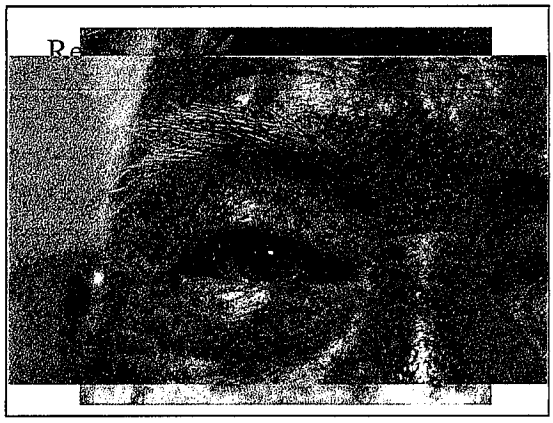
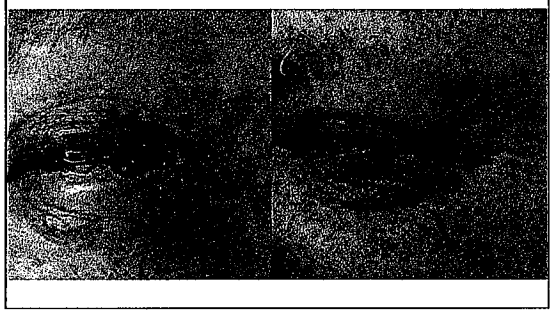
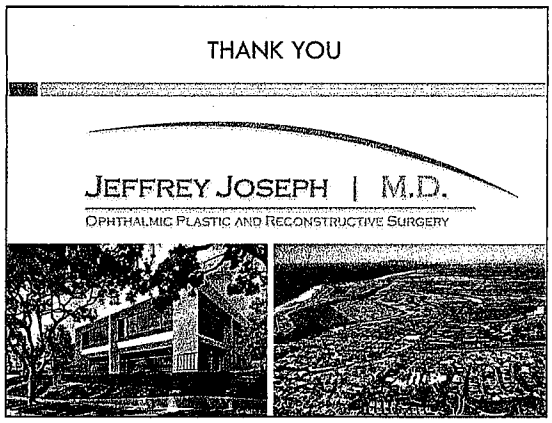


Reconstruction



Review

- The unique role and skills of the optometrist
  - Primary eye care provider
  - Be aware and systematic in periocular evaluation
  - Remember the "red flags"
- Skin cancer incidence is increasing- especially in SoCal
- Oculoplastic specialists are the most ideal referral for questionable lesions
- Treatment both, surgical and medical can yield excellent functional and cosmetic results


THANK YOU
JEFFREY JOSEPH | M.D.
OPHTHALMIC PLASTIC AND RECONSTRUCTIVE SURGERY

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Continuing Education Course Approval Checklist

Title: Time to Smile with KAMRA or Topoguided?
Provider Name: Gina Valdemar (Coastal Vision Medical Group)

☒Completed Application
- Open to all optometrists? ☒Yes ☐No
- Maintain record agreement? ☒Yes ☐No

☒Detailed Course Description
☒PowerPoint and/or other presentation materials
☒Advertising (optional)
☒CV for EACH course instructor
☒License Verification for each course instructor
- Disciplinary History? ☐Yes ☑No

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CONTINUING EDUCATION COURSE APPROVAL APPLICATION

$50 Mandatory

Pursuant to California Code of Regulations (CCR) § 1536, the Board will approve continuing education (CE) courses after receiving the applicable fee, the requested information below and it has been determined that the course meets criteria specified in CCR § 1536(g).

In addition to the information requested below, please attach a copy of the course schedule and topical outline of the subject matter. Applications must be submitted 45 days prior to the course presentation date.

Please type or print clearly.

Course Title	Course Presentation Date
Time to SMILE with KAMRA or topo guided?	01/28/2016

Course Provider Contact Information

Provider Name Coastal Vision Medical Group

Gina (First) Valdemar (Last) _____ (Middle)

Provider Mailing Address

Street 793 S. Main St. #100 **City** Orange **State** CA **Zip** 92868

Provider Email Address ginavaldemar@coastal-vision.com

Will the proposed course be open to all California licensed optometrists?	☒ YES ☐ NO
Do you agree to maintain and furnish to the Board and/or attending licensee such records of course content and attendance as the Board requires, for a period of at least three years from the date of course presentation?	☒ YES ☐ NO

Course Instructor Information

Please provide the information below and attach the curriculum vitae for each instructor or lecturer involved in the course. If there are more instructors in the course, please provide the requested information on a separate sheet of paper.

Instructor Name

Dan (First) Tran (Last) _____ (Middle)

License Number 93738	**License Type** MD
Phone Number (714) 746-9679	**Email Address** ginavaldemar@coastal-vision.com

I declare under penalty of perjury under the laws of the State of California that all the information submitted on this form and on any accompanying attachments submitted is true and correct.

Signature of Course Provider Dan Tran, MD Medical Director

Date 4-30-16

Form CE-01, Rev. 2/16

Course Title: The LASIK Rebirth: Time to SMILE with KAMRA or Topoguided?

Course Presentation date: 1/28/16

Speaker: Dan B. Tran, MD

Target Audience: This lecture is intended for optometrist seeking continuing education

Course Description:

This lecture provides Optometrists education to the insight of the latest Topoguided LASIK technology, Kamra corneal inlay and new SMILE (small incision lenticule extraction) procedure in FDA clinical trial. It gives them the knowledge of the applications, risks and benefits it can provide to patients who they can identify as potential candidates. FDA clinical data is explained to the Optometrist to better help them communicate and educate their patients of the findings. With the advancement of the technology it is imperative that Optometrist gain knowledge of it in order to better serve their patients.

CE Credit: 1 CE Unit

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Continuing Education Course Approval Checklist

Title: Update of Glaucoma Medical Treatments in 2016
Provider Name: Gina Valdemar (Coastal Vision Medical Group)

☒Completed Application
- Open to all optometrists? ☒Yes ☐No
- Maintain record agreement? ☒Yes ☐No

☒Detailed Course Description
☒PowerPoint and/or other presentation materials
☒Advertising (optional)
☒CV for EACH course instructor
☒License Verification for each course instructor
- Disciplinary History? ☐Yes ☒No

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$50 Mandatory

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In addition to the information requested below, please attach a copy of the course schedule and topical outline of the subject matter. Applications must be submitted 45 days prior to the course presentation date.

Please type or print clearly.

Course Title	Course Presentation Date
update of Glaucoma Medical treatments in 2016	01/28/2016

Course Provider Contact Information

Provider Name Coastal Vision Medical Group

Gina (First) Valdemar (Last) (Middle)

Provider Mailing Address

Street 293 S. Main St. #100 **City** Orange **State** CA **Zip** 92868

Provider Email Address ginavaldemar@coastal-vision.com

Will the proposed course be open to all California licensed optometrists?	☒ YES ☐ NO
Do you agree to maintain and furnish to the Board and/or attending licensee such records of course content and attendance as the Board requires, for a period of at least three years from the date of course presentation?	☒ YES ☐ NO

Course Instructor Information

Please provide the information below and attach the curriculum vitae for each instructor or lecturer involved in the course. If there are more instructors in the course, please provide the requested information on a separate sheet of paper.

Instructor Name

Baothu (Betsy) (First) Nguyen (Last) (Middle)

License Number 62609	**License Type** MD
Phone Number (714) 746 9679	**Email Address** ginavaldemar@coastal-vision.com

I declare under penalty of perjury under the laws of the State of California that all the information submitted on this form and on any accompanying attachments submitted is true and correct.

Signature of Course Provider — ***Date*** 4-30-16

Dan Tran, MD - Medical Director

Form CE-01, Rev. 2/16

Course Title: Update on Glaucoma Medical Treatments in 2016

Course Presentation date: 1/28/16

Speaker: Betsy (Baothu) Nguyen, MD

Target Audience: This lecture is intended for optometrist seeking continuing education

Course Description:

This lecture offers optometrists with case studies to identify symptoms, progression of treatment options, and surgical intervention techniques in patients with Glaucoma. Also educates Optometrist on the short and long term expectations of patient treatments.

CE Credit: 1 CE Unit

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Continuing Education Course
Approval Checklist

Title: Cataract Surgery in Fuchs Dystrophy Patients
Provider Name: Gina Valdemar (Coastal Vision Medical Group)

☒Completed Application
Open to all optometrists? ☒Yes ☐No
Maintain record agreement? ☒Yes ☐No
☒Detailed Course Description
☒PowerPoint and/or other presentation materials
☒Advertising (optional)
☒CV for EACH course instructor
☒License Verification for each course instructor
Disciplinary History? ☐Yes ☒No

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In addition to the information requested below, please attach a copy of the course schedule and topical outline of the subject matter. Applications must be submitted 45 days prior to the course presentation date.

Please type or print clearly.

Course Title	Course Presentation Date
Cataract Surgery in Fuchs Dystrophy Patients	02/16/2016

Course Provider Contact Information

Provider Name Coastal Vision Medical Group

Gina (First) Valdemar (Last) _____ (Middle)

Provider Mailing Address

Street 293 S. Main St. #100 **City** Orange **State** CA **Zip** 92868

Provider Email Address ginavaldemar@coastal-vision.com

Will the proposed course be open to all California licensed optometrists?	☒ YES ☐ NO
Do you agree to maintain and furnish to the Board and/or attending licensee such records of course content and attendance as the Board requires, for a period of at least three years from the date of course presentation?	☒ YES ☐ NO

Course Instructor Information

Please provide the information below and attach the curriculum vitae for each instructor or lecturer involved in the course. If there are more instructors in the course, please provide the requested information on a separate sheet of paper.

Instructor Name

Lisa (First) Garbutt (Last) _____ (Middle)

License Number 909909	**License Type** MD
Phone Number (714) 746-9679	**Email Address** ginavaldemar@coastal-vision.com

I declare under penalty of perjury under the laws of the State of California that all the information submitted on this form and on any accompanying attachments submitted is true and correct.

Signature of Course Provider Dan Tran, MD – Medical Director

Date 4-30-16

Form CE-01, Rev. 2/16

Course Title: Cataract Surgery in Fuchs Dystrophy Patients

Course Presentation date: 2/16/2016

Speaker: Lisa Garbutt, MD

Target Audience: This lecture is intended for optometrist seeking continuing education

Course Description:

This lecture educates Optometrist on the history, effects on vision, testing and surgical technique for treatment of patients with Fuchs Dystrophy and cataract surgery. It will also educate the Optometrists on the managing expectation related to patient treatment. Surgical techniques will be explained and also information about the use of a femtosecond laser.

CE Credit: 1 CE Unit

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Continuing Education Course
Approval Checklist

Title: Retinal Care of the Myopic Patient: Considerations for Refractive Surgery
Provider Name: Gina Valdemar (Coastal Vision Medical Group)

☒Completed Application
- Open to all optometrists? ☒Yes ☐No
- Maintain record agreement? ☒Yes ☐No

☒Detailed Course Description
☒PowerPoint and/or other presentation materials
☒Advertising (optional)
☒CV for EACH course instructor
☒License Verification for each course instructor
- Disciplinary History? ☐Yes ☒No

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In addition to the information requested below, please attach a copy of the course schedule and topical outline of the subject matter. Applications must be submitted 45 days prior to the course presentation date.

Please type or print clearly.

Course Title	Course Presentation Date
Retinal Care of the myopic patient: Considerations for refractive surgery	02/25/2016

Course Provider Contact Information

Provider Name Coastal Vision Medical Group

Gina (First) Valdemar (Last) _____ (Middle)

Provider Mailing Address

Street 393 S. Main St. #100 **City** Orange **State** CA **Zip** 92868

Provider Email Address ginavaldemar@coastal-vision.com

Will the proposed course be open to all California licensed optometrists?	☒ YES ☐ NO
Do you agree to maintain and furnish to the Board and/or attending licensee such records of course content and attendance as the Board requires, for a period of at least three years from the date of course presentation?	☒ YES ☐ NO

Course Instructor Information

Please provide the information below and attach the curriculum vitae for each instructor or lecturer involved in the course. If there are more instructors in the course, please provide the requested information on a separate sheet of paper.

Instructor Name

Timothy (First) Yon (Last) _____ (Middle)

License Number 920625	**License Type** MD
Phone Number (714) 746 9679	**Email Address** ginavaldemar@coastalvision.com

I declare under penalty of perjury under the laws of the State of California that all the information submitted on this form and on any accompanying attachments submitted is true and correct.

Signature of Course Provider 4-30-16 ***Date***

Dan Tran, MD – Medical Director

Form CE-01, Rev. 2/16

Course Title: Retinal Care of The Myopic Patient: Considerations for refractive surgery

Course Presentation date: 2/25/2016

Speaker: Timothy You, MD

Target Audience: This lecture is intended for optometrist seeking continuing education

Course Description:

This lecture educates the Optometrists on the identification, treatment options and care in relation to patient diagnoses. It also provides them with the education of refractive surgery discussion to what considerations need to be taken for patients as it relates to their condition.

CE Credit: 1 CE Unit

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Continuing Education Course Approval Checklist

Title: Management of Corneal Ulcers
Provider Name: Gina Valdemar (Coastal Vision Medical Group)

☒Completed Application
- Open to all optometrists? ☒Yes ☐No
- Maintain record agreement? ☒Yes ☐No

☒Detailed Course Description
☒PowerPoint and/or other presentation materials
☒Advertising (optional)
☒CV for EACH course instructor
☒License Verification for each course instructor
- Disciplinary History? ☐Yes ☒No

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CONTINUING EDUCATION COURSE APPROVAL APPLICATION

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In addition to the information requested below, please attach a copy of the course schedule and topical outline of the subject matter. Applications must be submitted 45 days prior to the course presentation date.

Please type or print clearly.

Course Title	Course Presentation Date
Management of Corneal Ulcers	03/09/2016

Course Provider Contact Information

Provider Name Coastal Vision Medical Group

Gina (First) Valdemar (Last) _____ (Middle)

Provider Mailing Address

Street 393 S. Main St. #100 **City** Orange **State** CA **Zip** 92868

Provider Email Address ginavaldemar@coastal-vision.com

Will the proposed course be open to all California licensed optometrists?	☒ YES ☐ NO
Do you agree to maintain and furnish to the Board and/or attending licensee such records of course content and attendance as the Board requires, for a period of at least three years from the date of course presentation?	☒ YES ☐ NO

Course Instructor Information

Please provide the information below and attach the curriculum vitae for each instructor or lecturer involved in the course. If there are more instructors in the course, please provide the requested information on a separate sheet of paper.

Instructor Name

Lisa (First) Garbutt (Last) _____ (Middle)

License Number 90909	**License Type** MD
Phone Number (714) 746-9679	**Email Address** ginavaldemar@coastal-vision.com

I declare under penalty of perjury under the laws of the State of California that all the information submitted on this form and on any accompanying attachments submitted is true and correct.

Signature of Course Provider Dan Tran, MD - Medical Director

Date 4-30-16

Course Title: Management of Corneal Ulcers

Course Presentation date: 3/9/2016

Speaker: Lisa Garbutt, MD

Target Audience: This lecture is intended for optometrist seeking continuing education

Course Description:

This lecture educates Optometrists on how to profile, culture and when to refer different types of corneal ulcers. Additionally, education of the types of infections and the symptoms it can cause the cornea to present. The advancement in treatment options will then be explained in relation to infectious and non-infectious ulcers.

CE Credit: 1 CE Unit

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Continuing Education Course Approval Checklist

Title: The New Age of Refractive Cataract Patients
Provider Name: Gina Valdemar (Coastal Vision Medical Group)

☒Completed Application
- Open to all optometrists? ☒Yes ☐No
- Maintain record agreement? ☒Yes ☐No

☒Detailed Course Description
☒PowerPoint and/or other presentation materials
☒Advertising (optional)
☒CV for EACH course instructor
☒License Verification for each course instructor
- Disciplinary History? ☐Yes ☒No

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In addition to the information requested below, please attach a copy of the course schedule and topical outline of the subject matter. Applications must be submitted 45 days prior to the course presentation date.

Please type or print clearly.

Course Title	Course Presentation Date
The New Age of Refractive Cataract patients	03/09/2016

Course Provider Contact Information

Provider Name Coastal Vision Medical Group

Gina (First) Valdemar (Last) _____ (Middle)

Provider Mailing Address

Street 293 S. Main St. #100 **City** Orange **State** CA **Zip** 92868

Provider Email Address ginavaldemar@coastal-vision.com

Will the proposed course be open to all California licensed optometrists?	☒ YES ☐ NO
Do you agree to maintain and furnish to the Board and/or attending licensee such records of course content and attendance as the Board requires, for a period of at least three years from the date of course presentation?	☒ YES ☐ NO

Course Instructor Information

Please provide the information below and attach the curriculum vitae for each instructor or lecturer involved in the course. If there are more instructors in the course, please provide the requested information on a separate sheet of paper.

Instructor Name

Dan (First) Tran (Last) Bao (Middle)

License Number 837399	**License Type** MD
Phone Number (714) 746 9679	**Email Address** ginavaldemar@coastal-vision.com

I declare under penalty of perjury under the laws of the State of California that all the information submitted on this form and on any accompanying attachments submitted is true and correct.

Signature of Course Provider 4-30-16 ***Date***

Dan Tran, MD - Medical Director

Form CE-01, Rev. 2/16

Course Title: The New Age of Refractive Cataract Patients

Course Presentation date: 3/9/2016

Speaker: Dan B Tran, MD

Target Audience: This lecture is intended for optometrist seeking continuing education

Course Description:

Optometrist will be educated on the technology and expectations of today's Cataract patient options, applications, expectations and techniques. Optometrists will be provided with the knowledge to better educate their patients on expected outcomes and different IOL types.

CE Credit: 1 CE Unit

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Continuing Education Course
Approval Checklist

Title: Diagnosing Glaucoma: To Start or Not to Start, That is the Question
Provider Name: Gina Valdemar (Coastal Vision Medical Group)

☒Completed Application
- Open to all optometrists? ☒Yes ☐No
- Maintain record agreement? ☒Yes ☐No

☒Detailed Course Description
☒PowerPoint and/or other presentation materials
☒Advertising (optional)
☒CV for EACH course instructor
☒License Verification for each course instructor
- Disciplinary History? ☐Yes ☒No

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CONTINUING EDUCATION COURSE APPROVAL APPLICATION

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In addition to the information requested below, please attach a copy of the course schedule and topical outline of the subject matter. Applications must be submitted 45 days prior to the course presentation date.

Please type or print clearly.

Course Title	Course Presentation Date
Diagnosing Glaucoma - to start or not to start, that is the question -	03/25/2016

Course Provider Contact Information

Provider Name Coastal Vision Medical Group

Gina (First) Valdemar (Last) (Middle)

Provider Mailing Address

Street 293 S. Main St. #100 **City** Orange **State** CA **Zip** 92868

Provider Email Address ginavaldemar@coastal-vision.com

Will the proposed course be open to all California licensed optometrists?	☒ YES ☐ NO
Do you agree to maintain and furnish to the Board and/or attending licensee such records of course content and attendance as the Board requires, for a period of at least three years from the date of course presentation?	☒ YES ☐ NO

Course Instructor Information

Please provide the information below and attach the curriculum vitae for each instructor or lecturer involved in the course. If there are more instructors in the course, please provide the requested information on a separate sheet of paper.

Instructor Name

Baothue (Betsy) (First) Nguyen (Last) (Middle)

License Number 62609	**License Type** MD
Phone Number (714) 746-9679	**Email Address** ginavaldemar@coastal-vision.com

I declare under penalty of perjury under the laws of the State of California that all the information submitted on this form and on any accompanying attachments submitted is true and correct.

Signature of Course Provider ***Date*** 4-30-16

Dan Tran, MD – Medical Director

Course Title: Diagnosing Glaucoma: To Start or Not to Start, that is the question

Course Presentation date: 3/15/2016

Speaker: Baothu (Betsy) Nguyen, MD

Target Audience: This lecture is intended for optometrist seeking continuing education

Course Description:

This lecture seeks to educate optometrists on diagnosing glaucoma patients by presenting case studies and images that help identify findings. Discussion is had and options are presented. With this interactive presentation, the optometrists are then educated on when to start or not start treatment glaucoma regimens.

CE Credit: 1 CE Unit

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Continuing Education Course
Approval Checklist

Title: Retinal Imaging - OCT
Provider Name: Gina Valdemar (Coastal Vision Medical Group)

☒Completed Application
Open to all optometrists? ☒Yes ☐No
Maintain record agreement? ☒Yes ☐No
☒Detailed Course Description
☒PowerPoint and/or other presentation materials
☒Advertising (optional)
☒CV for EACH course instructor
☒License Verification for each course instructor
Disciplinary History? ☐Yes ☒No

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In addition to the information requested below, please attach a copy of the course schedule and topical outline of the subject matter. Applications must be submitted 45 days prior to the course presentation date.

Please type or print clearly.

Course Title	Course Presentation Date
Retinal Imaging - OCT	03/15/2016

Course Provider Contact Information

Provider Name: Coastal Vision Medical Group

Gina (First) Valdemar (Last) _____ (Middle)

Provider Mailing Address

Street: 225 S. Main St #100 City: Orange State: CA Zip: 92868

Provider Email Address: ginavaldemar@coastal-vision.com

Will the proposed course be open to all California licensed optometrists?	☒ YES ☐ NO
Do you agree to maintain and furnish to the Board and/or attending licensee such records of course content and attendance as the Board requires, for a period of at least three years from the date of course presentation?	☒ YES ☐ NO

Course Instructor Information

Please provide the information below and attach the curriculum vitae for each instructor or lecturer involved in the course. If there are more instructors in the course, please provide the requested information on a separate sheet of paper.

Instructor Name

Eugene (First) Chang (Last) _____ (Middle)

License Number: 77825	License Type: MD
Phone Number: (714) 746-9679	Email Address: ginavaldemar@coastal-vision.com

I declare under penalty of perjury under the laws of the State of California that all the information submitted on this form and on any accompanying attachments submitted is true and correct.

Signature of Course Provider: Dan Tran, MD - Medical Director

Date: 4-30-16

Form CE-01, Rev. 2/16

Course Title: Retinal Imaging-OCT

Course Presentation date: 3/15/2016

Speaker: Eugene Chang, MD

Target Audience: This lecture is intended for optometrist seeking continuing education

Course Description:

This lecture seeks to educate Optometrists on the current trends of retinal imaging. It provides history of optical coherence of Tomography. It goes into detail and explanation of the retinal fibers via OTC imaging. It discusses the interpretation of the images. The lecture then explains the advancements of imaging and the difference in systems. Sample images are shown to aid the Optometrist in understanding and identifying the finding of the images. Treatments are discussed along with expected outcomes for patients.

CE Credit: 1 CE Unit

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Continuing Education Course
Approval Checklist

Title: Myopic Treatment in Presbyopic Patients
Provider Name: Gina Valdemar (Coastal Vision Medical Group)

☒Completed Application
Open to all optometrists? ☒Yes ☐No
Maintain record agreement? ☒Yes ☐No
☒Detailed Course Description
☒PowerPoint and/or other presentation materials
☒Advertising (optional)
☒CV for EACH course instructor
☒License Verification for each course instructor
Disciplinary History? ☐Yes ☒No

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CONTINUING EDUCATION COURSE APPROVAL APPLICATION

$50 Mandatory

Pursuant to California Code of Regulations (CCR) § 1536, the Board will approve continuing education (CE) courses after receiving the applicable fee, the requested information below and it has been determined that the course meets criteria specified in CCR § 1536(g).

In addition to the information requested below, please attach a copy of the course schedule and topical outline of the subject matter. Applications must be submitted 45 days prior to the course presentation date.

Please type or print clearly.

Course Title	Course Presentation Date
Myopic Treatment in Presbyopic Patients	03/23/2016

Course Provider Contact Information

Provider Name: Coastal Vision Medical Group

Gina (First) Valdemar (Last) _____ (Middle)

Provider Mailing Address

Street 293 S. Main St. #100 City Orange State CA Zip 92868

Provider Email Address: ginavaldemar@coastal-vision.com

Will the proposed course be open to all California licensed optometrists?	☒ YES ☐ NO
Do you agree to maintain and furnish to the Board and/or attending licensee such records of course content and attendance as the Board requires, for a period of at least three years from the date of course presentation?	☒ YES ☐ NO

Course Instructor Information

Please provide the information below and attach the curriculum vitae for each instructor or lecturer involved in the course. If there are more instructors in the course, please provide the requested information on a separate sheet of paper.

Instructor Name

Dan (First) Tran (Last) Bao (Middle)

License Number: 833738	License Type: MD
Phone Number: (714) 746-9619	Email Address: ginavaldemar@coastal-vision.com

I declare under penalty of perjury under the laws of the State of California that all the information submitted on this form and on any accompanying attachments submitted is true and correct.

Signature of Course Provider _____ *Date* 4-20-16

Form CE-01, Rev. 2/16

Course Title: Myopic Treatment in Presbyopic Patients

Course Presentation date: 3/23/2016

Speaker: Dan Tran, MD

Target Audience: This lecture is intended for optometrist seeking continuing education

Course Description:

This lecture seeks to provide optometrists on the advancement of treatment options for Presbyopic patients. Myopic patients now have additional options for their vision options. The risk and benefits are discussed along with applications for the possible patient candidates. Given this knowledge, it prepares the Optometrist with ample information to educate and plan their patient care.

CE Credit: 1 CE Unit

COASTALVISION
Medical Group Inc.

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FREE 2-Hour CE

Featuring

Dan Tran, MD & Betsy Nguyen, MD

The LASIK Rebirth:
Time to SMILE with KAMRA or Topoguided?
&
Update on Glaucoma Medical Treatments in 2016

WHEN:

Thursday
January 28th, 2016
6:30 PM

WHERE:

Roy's Restaurant-Anaheim
321 W. Katella Ave.
Anaheim, CA 92802

RSVP TO:

Fax: 949.258.5085 OR ginavaldemar@coastal-vision.com

Affiliate Name: _____
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The LASIK Rebirth:
Time to SMILE with KAMRA or Topoguided?
&
Cataract Surgery in Fuchs' Dystrophy Patients

WHEN:

Tuesday
February 16, 2016
6:30 PM

WHERE:

Oak Creek Golf Club
One Golf Club Drive
Irvine, CA 92618

RSVP TO:

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Dan Tran, MD & Timothy You, MD

The LASIK Rebirth:
Time to SMILE with KAMRA or Topoguided?
&
Retinal Care of the Myopic Patient:
Considerations for Refractive Surgery

WHEN:

Thursday
February 25, 2016
6:30 PM

WHERE:

Coyote Hills Golf Course
1440 E Bastanchury Rd.
Fullerton, CA 92835

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Please join us for a:

FREE 2-Hour CE

Featuring

Dan Tran, MD & Lisa Garbutt, MD

Management of Corneal Ulcers
&
The New Age of Refractive Cataract Patients

WHEN:

Wednesday
March 9th, 2016
6:30 PM

WHERE:

Vellano Country Club
2441 Vellano Club Drive
Chino Hills, CA 91709

RSVP TO:

Fax: 949.258.5085 OR ginavaldemar@coastal-vision.com

Affiliate Name: _____

Cell Number: _____

Email: _____

COASTALVISION
Medical Group Inc.

Please join us for a:

FREE 2-Hour CE

Featuring

Betsy Nguyen, MD & Eugene Chang, MD

Diagnosing Glaucoma:
To Start or Not to Start? That is the Question.
&
Retinal Imaging – OCT

WHEN:

Tuesday
March 15, 2016
6:30 PM

WHERE:

Aliso Viejo Conference Center
(Next to Aliso Viejo Country Club)
31 Santa Barbara Dr.
Aliso Viejo, CA 92656

RSVP TO:

Fax: 949.258.5085 OR GinaValdemar@coastal-vision.com

Affiliate Name: _____
Cell Number: _____
Email: _____

COASTALVISION
Medical Group Inc.

Please join us for a:

FREE 2-Hour CE

Featuring

Dan Tran, MD & Betsy Nguyen, MD

Myopic Treatment in Presbyopic Patients
&
Diagnosing Glaucoma:
To Start or Not to Start? That is the Question.

WHEN:

Wednesday
March 23, 2016
6:30 PM

WHERE:

Brodard Chateau
9100 Trask Ave.
Garden Grove, CA 92844

RSVP TO:

Fax: 949.258.5085 OR ginavaldemar@coastal-vision.com

Affiliate Name: _____

Cell Number: _____

Email: _____

1 **Time to 'SMILE' with KAMRA Or Should We Topoguided Contoura Vision**

Dan B. Tran, MD
Medical Director – Coastal Vision Medical Group
Irvine, Long Beach, Orange - California

2 **FINANCIAL DISCLOSURES**

- Consultant and Study Grant Recipient
  - Alcon
  - ReVision Optic
  - Ivantis
- Principle Investigator FDA clinical trials
  - AMO
  - ReVision Optic
  - Ivantis
  - Transcend Medical
  - ReFocus Group

3 **Excimer Lasers**

- Excimer lasers were developed in the 1970s by IBM to etch microchips
- Use in the eye postulated in 1983
- Employs a cold beam of light that DOES NOT BURN
- Can treat myopia, hyperopia and astigmatism
- Will not cause or treat cataracts

4 **Excimer Laser Used on a Human Hair**

5 **Picosecond Intrastromal Ablation**

- Intrastromal bubbles coalesce to cleave tissue
- Clinically failed to get PRK-like refractive effect in 1995 U.S. FDA Trial

6 **History**

- 1998: First clinical Femtosecond laser in cornea
- 2000: Initial U.S. use of Femtosecond Laser keratome for LASIK
- 2001: Commercial launch of IntraLase FS (1st generation)
- 2003: 2nd generation IntraLase FS Laser
- 2005: 3rd generation IntraLase FS Laser
- 2006: 4th generation IntraLase FS Laser
- 2016: FS200 & Ziemer & Intralase & VisuMax & LenSx
-

7 **IntraLase Patient Interface**

8 **Energy Dependent Mechanisms in Photodisruption Process**

9

10

11 **DOES PUPIL SIZE MATTER?**

12

13 **Depth of focus is a function of pupil size**

14 **The Total Aberrations of the Eye**

15 **Tran, Sarayba, et al**
JCRS Jan 2005

-
- Randomized, prospective
- Contralateral - Blade vs IntraLase
- 9 patients, 18 eyes
- Flap cut only
- Measure flap-induced HOA
- Excimer treatment 10 weeks after flap

16

17 **Durrie, Kezirian**
JCRS Jan 2005

-
- Randomized, prospective, contralateral eye
-
- Blade vs IntraLase
-
- 102 eyes

18 **LASIK Visual Outcome**

19 **US NAVY Study**
Schallhorn, Tanzer

- Comparison of Visual Outcomes with Femtosecond and Mechanical Keratomes for WFG LASIK
-
- Return to flight status sooner
- *Best technology for flap creation*

20 **LASIK ENHANCEMENT RATE**

21

22 **Microkeratome cut**

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-
- Lamellar structure of the cornea

- Microkeratome cuts deep in periphery with poor diameter and centration control

23 **IntraLase cut**

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-
-
-
-
-
-
- Lamellar structure of the cornea
- IntraLase cuts thin planar flap with precise depth, diameter and centration control

24 **Biomechanical Evidence**
Strength of Inverted Side Cut Angle

Purpose:

- To determine biomechanical strength effect of varied side cut angles (100° to 150°) on strain changes during corneal incision

25

26 **Results of Comparative Measurement of**
Flap Tensile Strengths in New Zealand White Rabbits
(3 months post-op)

27 **Technology Updates**
WaveLight Refractive Suite

28

29 **FDA Approvals**

Various Custom Options:

- Lamellar corneal flaps
- Intracorneal ring segments
- Lamellar keratoplasty
- Penetrating keratoplasty

30

31

Variable Hinge

- 30 to 90 degrees length
- Position 0 to 360 degrees
  - Perfect custom fit to ablation profile

32 **Conclusion**

- Advanced Suction Technology
  - A. Enhanced Suction Ring Design - < IOP
  - B. Two Vacuum Pumps - < manipulation
- Beam Control Check – > flap predictability
- Enhanced OBL Management - < OBL

- Speed – quicker procedure
- Customization Versatility - > variety of cutting
-
-

33

34 **The WaveLight® Allegretto Wave® Excimer Laser Difference: Speed and Spot Size**

ALLEGRETTO WAVE® Laser System
- 200 Hz ablation rate
- Approximately 4 seconds per diopter ablation
- 0.95 mm Gaussian laser beam

ALLEGRETTO WAVE® Eye-Q Laser System
- 400 Hz ablation rate
- Approximately 2 seconds per diopter ablation
- 0.95 mm Gaussian laser beam

EX500 Laser System
500 Hz ablation rate
1050 Hz eye tracker
Approximately 1.4 seconds per diopter ablation
.95mm Gausian laser beam

35 **The WaveLight® Allegretto Wave® Excimer Laser Difference: Optimized Shot Distribution**
- Only every 5th pulse overlaps a previous one
- Minimizes thermal effects

36 **Why Does Speed Matter?**
- Reduces stromal dehydration
- Reduces exposure to temperature and humidity factors
- Reduces effects of altitude
- Shortens patient fixation time
- Improves patient throughput

37

38

39

ReLEx-Smile preserves corneal biomechanics
- Anterior and central stromal lamellae are stronger*1
- Vertical cuts weakening the cornea strain much more than horizontal cuts*2
  - Goal: preserve most of the anterior stroma, minimize vertical cuts/sidecuts (length & depth)

Advantage of ReLEx-Smile vs F-Lasik:
- ➢ Intact anterior stromal lamellae and no anterior corneal sidecut
- ➢ 50-70µ of the anterior stroma additionally contribute to corneal tensile strength

--> Better corneal biomechanical stability

→
→
→
→

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40

41 **Dry Eye Study**

42 **VisuMax Spherocylindrical Study**

- Study Objective:
  - ➢To evaluate the safety and effectiveness of the Carl Zeiss Meditec VisuMax™ Femtosecond Laser lenticule removal procedure for the reduction or elimination of myopia from ≥ -1.00 D to ≤ -10.00 D with ≤ -3.00 D cylinder and MRSE ≤ -11.50 D
  - ➢≤ -0.50 D cylinder not treated as part of this clinical trial
  - ➢Treatment on one eye only

•
•

- Study Update:
  - ➢Enrollment initiated February, 2015
  - ➢100 eyes treated across 5 U.S. study sites (90 spherocyl treatments)

- 3-month safety and effectiveness data on 69 eyes (59 of which were treated for astigmatic myopia) submitted to FDA for consideration of study expansion to full cohort of up to 360 eyes
-
-
-

43 **Uncorrected Visual Acuity (ETDRS) Outcomes at 3 Months**

44 **Change in Best Spectacle Corrected Visual Acuity (ETDRS) at 3 Months (N = 69)**

45 **An Aging Population Means Increasing Presbyopia Prevalence[1]**

Future Global Projection
- 1.4 billion presbyopia patients by 2020
- 1.8 billion presbyopia patients by 2050

46 **Current (FDA) Presbyopia Treatment Options**

1. Non-Surgical Options
   - Corrective eyewear
     - Glasses (reading glasses)
     - Specialty contact lenses
2. Surgical Options
   - Monovision LASIK / PRK
   - Corneal Inlay KAMRA
   -
   -
   -
   -
   -
   - Refractive Lens Exchange / Cataract
   -
   -
   -

47 **Introduction to the KAMRA® Inlay**

48 **The KAMRA® Inlay**

49 **Inlay Design**

50 **The KAMRA® Inlay Indications for Use**

The KAMRA® inlay is indicated for intrastromal corneal implantation to improve near vision by extending the depth of focus in the non-dominant eye of phakic, presbyopic patients between the ages of 45 and 60 years old who have cycloplegic refractive spherical equivalent of +0.50 D to -0.75 D with less than or equal to 0.75 D of refractive

cylinder, who do not require glasses or contact lenses for clear distance vision, and who require near correction of +1.00 D to +2.50 D of reading add.

•

51 **Corneal Physiologic Principles**

- Oxygen enters from the tears
- Glucose & other metabolites enter from the aqueous humor
- Catabolites exit to the aqueous humor

52 **Depth of Focus *without* Correction**

53 **Depth of Focus *with* the Inlay**

Depth of focus and image quality of a KAMRA® inlay eye of a 49 Year Old Presbyope

54 **Inlay Placement Guidance**

- The AcuTarget HD™ instrument provides pre-op and post-op centration information:
  - Identifies unique optical landmarks to assist with inlay centration planning
  - Confirms achieved inlay placement
  - Assists with managing vision complaints post-operatively
  - Advanced features:
    - Pre-op result also identifies purkinje vs pupil by location (i.e. inferior temporal)
    - Pre-op print out includes additional ocular landmark graphics, patient demographic, time and date information

•

55 **Results**

56 **Uncorrected Near Visual Acuity:**
Inlay Eye – Data from US IDE

- On average patients experienced a gain of 3.4 lines of near acuity between pre-op and the 36 month follow-up visit

57 **Uncorrected Intermediate Visual Acuity: *Inlay Eye***

58 **Uncorrected Distance Visual Acuity:**
Inlay Eye

- Monocular uncorrected distance acuity in the inlay eye remained unchanged at 20/20

59 **UCNVA at 5 Years**

- UCNVA improved from a mean of J8 to J2 in the inlay eye (IE) between pre-op and 1 month and is maintained out to 5+ years
- Vision in the inlay eye and with both eyes (BE) is unaffected by the progression of presbyopia
- UCNVA in the untreated other eye (OE) shows an mean loss of 1 line over the same time period

•

60 **Summary of Results**

- Near vision of J2 achieved on average

- Distance vision is minimally affected
- Long-term data shows maintained visual gain
- Results show that binocular mesopic contrast sensitivity remains within normal limits at 24 months post-op.
- There was no statistically significant change to depth perception as compared with pre-op results in the study done by Dr. Hoopes
-
-
-

61 **Clinical Impact of the KAMRA® Inlay on Ophthalmic Assessments**

62 **KAMRA® Inlay Clinical Impact**

- How does the inlay impact ophthalmic assessments?
  - Cornea
  - Anterior chamber
  - Lens
  - Retina

63

64 **HRT Confocal Image**

65

66 **Chamber Angle Imaging**

67 **Lens**

68 **Macula**

69 **Fundus Exam: Center & Periphery**

70 **Optic Nerve Imaging (6-months Post-Op)**

71 **Visual Field**

72 **The VisAbility U.S. Clinical Trial (FDA)**

- Now enrolling: Multi-Center 2 year study to generate data for a U.S. submission and possible approval
- Safety is paramount and the foremost priority of the study
- Investigating significant improvements in instrumentation and technique
- Early access to the newest technology
  - Longstanding history
  - Developed by Refocus Group, Inc. (founded in 1996)
  - CE Marked in the E.U.

- Procedure provided at no cost
- Open to only 360 patients
  - Limited to 28 patients are each site
  - Available (in the U.S.) for a limited time

73 **How does VisAbility™ work?**

- Implants may help the focusing muscles of the eye work better and improve near vision

74 **What are VisAbility Implants?**

- Tiny clear implants made of PMMA polymer
  - Sterile, single-use, and biologically inert
  - Same material that has been implanted in other surgical procedures for over 50 years

75 **What happens during the VisAbility Procedure**

- Numbing drops and antianxiety medications given to keep you comfortable and relaxed
-
- 4 (four) VisAbility Implants are placed just below the surface of the white of the eye through tiny incisions
-
- The outpatient procedure is minimally invasive and typically takes 15-20 minutes per eye.
-
- OR staff will observe patients immediately after surgery for any potential complications
-

76 **What to expect after the VisAbility Procedure**

- Improvement in near vision
- Slight irritation that usually goes away in a few days
- Temporary redness that goes away after a 3-4 week healing period
-
-
-
-
-
  - After healing period patients should feel confident to pursue any normal activities

77

1 **UPDATE OF GLAUCOMA MEDICAL TREATMENT 2016**

Betsy Bao-Thu Nguyen, M.D.

2 **CASE PRESENTATION**

- RM is a 73 yo active WM with POAG, treated with a prostaglandin for 3 years, presents with possible progression on HVF and has an IOP of 21 mm Hg. Repeat VF confirms the defect.

  WHAT IS YOUR NEXT TREATMENT STEP?

  -

3 **HVF 24-2 SITA STANDARD**

4 **CASE PRESENTATION: RM**

- 73 yo WM, POAG X 3 yrs, on Lumigan OU qhs
- Va : 20/30 OU , low hyperope
- IOP (applanation) 9 am: 21 OD, 22 OS
- 2+ Nuclear sclerosis OU
- Pachy: 510 OD and 505 OS
- Gonio: Grade IV, open to CBB
- Fam history: mother
-

5 **CASE PRESENTATION**

- What is your next treatment step?
  - A. Followup in a month: repeat VF & recheck IOP.
  - B. Start on a second medication
  - C. Selective Laser trabeculoplasty
  - D. Cataract surgery alone & referral to Dr. Nguyen
  - E. Cataract surgery with MIGs & referral to Dr. N
  - F. Traditional Glaucoma surgery (Trabeculectomy or tube)
  - G. Wait for approval of new glaucoma medication
    -
    -

6 **THE TREATMENT GOAL:** **Lowering intraocular pressure consistently with flat diurnal curve = LESS progression**

- Our paradigm shift in glaucoma treatment
  1) Target intraocular pressure range: 25-30% goal?? (AAO Preferred Practice Pattern: at least 25% from pretreatment IOP)
  2) Shift to switching medications vs. adding medications
  3) Shift to less medications (need compliance !)-- perform SLT, or Cataract surgery, or Cataract surgery with MIGS
  4) Other strategies, in addition to IOP lowering, may be required to prevent visual field loss (ie: neuroprotection)

7 **IOP increases at night with supine position**

- Beta blockers probably ineffective at night
- May explain glaucoma progression in patient whose IOP is consistently low in the office
- Future: contact lens for 24-48 hr continuous monitoring

8 **History of Glaucoma Medications**

- Parasympathomimetics (1877)
- Beta Blockers (1978)
- Oral Carbonic Anhydrase Inhibitors (1978)
- Selective Alpha-adrenergic agonists (1987)
- Topical Carbonic anhydrase inhibitors (1995)
- Prostaglandin analogues (1996)
- Combination (Cosopt 1998, Combigan 2007,Simbrinza 2013)

9 **FUTURE Glaucoma Medications**

- Rhokinase inhibitors (ROCK) (2017?)
- Selective Adenosine agonists (Trabodenoson) (2017?)
-
- Nitric oxide (NO) : relax TM→increase TM aqueous outflow (FDA review by 7/2016?)
  - (Vesneo= latanoprostene bunod, NO-donating PG F2-alpha analog)

10 **GLAUCOMA MEDS LOWERING IOP: MECHANISM OF MEDICATION**

- 1) Reduce aqueous humor production
  - --Beta-blockers
  - --Carbonic anhydrase inhibitors
  - --Alpha adrenergic agonists

11 **GLAUCOMA MEDS LOWERING IOP: MECHANISM OF MEDICATION**

- 2) Increase fluid outflow (uveoscleral outflow vs. trabecular outflow)
  - Prostaglandins
  - Alpha adrenergic receptor agonists
  - Pilocarpine

  _FUTURE: Rho Kinase inhibitors (ROCK), adenosine agonists (Trabodenoson), NO (Vesneo)

12 **Prostaglandin analogues are the 1st line /GOLD standard for monotherapy**

- Xalatan 0.005% (since 1996) (latanaprost) -BAK
- Lumigan 0.01% (bimatoprost) - BAK
- Travatan-Z 0.004% (travoprost) – SofZia
- Zioptan 0.0015% (tafluprost) –preservative free
- (Rescula –prostamide)– ineffective. DISCONTINUED.
-
- TOLERABILITY TO ONE PROSTAGLANDIN MAY BE DIFFERENT THAN TO OTHERS!

-
- Flat diurnal curve
- 28 – 33% IOP lowering (Want monotherapy)
- Zioptan slightly less effective IOP lowering
-
-
-

13 **Prostaglandin GENERICS: reality of 2016**

- Latanaprost -BAK
- Bimatoprost .03% - BAK... more hyperemic than Lumigan .01%
- Travoprost – BAK
-
- NOT all generics are created equal...
- Will it lower IOP consistently between different manufacturers?
-
-
-
-

14 **OLD GOLD STANDARD: B blockers (decrease aqueous humor production)**

- 1) Well known that may cause bradycardia, respiratory distress, DECREASED exercise tolerance, impotence, depression, congestive heart failure, and mask hypoglycemia
- 2) Tachyphylaxis
- 3) Ineffective at night (NOT flat diurnal curve)
- 4) Less effective w/concurrent systemic Beta Blocker
- 5) Adjunct to PG→only 1-2 more additional IOP lowering
- 6) Nonselective B blocker may decrease ocular blood flow, due to vasoconstriction
- 7) But if tolerated and effective, the generic medication can be cost effective.

15 **Carbonic Anhydrase Inhibitors (CAI): (decrease aqueous humor production)**

- Trusopt
- Azopt
- Generic Dorzolamide
  - TID dosing, adjunctive therapy
-
- Oral Diamox 250 mg, 500 mg, 500 mg SR
- Oral Neptazane 25 mg , 50 mg
  - Short term use for high IOP (NVG, acute angle closure, PXE) and non-surgical candidate
  - Avoid in sulfa allergy
-
-

16 **Alpha 2 Adenergic Agonist : dual mechanism of decrease aqueous humor production & increase uveoscleral outflow**

- Alphagan-P .01%

- Generic Brimonidine .15 % and .20%
  - TID dosing, adjunctive therapy
  - Controversial /never proven that it increases ocular blood flow
  -
-
- Allergic eyelid dermatitis
- Chronic conjunctivitis
-

17 **Parasympathomimetics : increase TM outflow**
- Pilocarpine 1%, 2%, 4%, 6% -QID dosing
- Carbachol
-
- Side effects: miosis, worsens vision with cataracts, retinal detachments
- Still role in narrow angle patients
-

18 **SOME PATIENTS ARE ALLERGIC TO BAK**
PRESERVATIVE FREE

- Zioptan
- Cosopt PF
- Timoptic Ocudose
- Leiter's Pharmacy: compounded

19 **Combination Medications:** **can increase compliance**
-
- Combinations : Simbrinza, Combigan, Cosopt , Dorzolamide-Timolol, Cosopt PF
- May be good adjunctive therapy to Prostaglandin
- May improve compliance (less bottles), less toxic to conjunctiva and cornea, less cost?
- NOT available in USA: PG-beta block, PG-CAI
-

20 **HOW OFTEN IS 1 MEDICATION NOT ENOUGH?**
- OHTS TRIAL: 49 % patients required 2 or more medications to reach target IOP
- CIGTS TRIAL: >75 % patients required 2 or more medications to reach target IOP
-
- 30 % patients starting meds→require adjunctive therapy within 1 year

-

21 **SECOND bottle choices: Combination meds can increase compliance and be more effective**
- Combinations (Simbrinza, Combigan, Cosopt or its generic)
- Alpha adrenergic agonists = Alphagan-P 0.1% vs generic brimonidine 0.15 & 0.2%
- Topical carbonic anhydrase inhibitors = Trusopt, generic dorzolamide, Azopt
- Beta Blockers
-

22 **Patients often do not remember: A Medication Chart can be given to the patient each visit.**

23 **FUTURE Glaucoma Medications**

- Rhokinase inhibitors (ROCK) (2017?)
- Selective Adenosine agonists (Trabodenoson) (2017?)
-
- Nitric oxide (NO) : relax TM→increase TM aqueous outflow (FDA review by 7/2016?)
  - (Vesneo= latanoprostene bunod, NO-donating PG F2-alpha analog)

24 **Rhokinase inhibitors (ROCK inhibitors) : increase TM outflow**

- Multiple medications in different stages of development (none have been FDA approved)
- Increases TM outflow, by Rho kinase inhibition (relax TM and disrupt adhesions in TM and Schlemm's canal).. ? Does it improve ocular blood flow??
- Rhopressa (Aerie Pharmaceuticals)-Phase 3 trial
  - Qd dosing. Side effect: conj hyperemia
  - Lowers IOP 5-6 pts
  - ROCK/NET-also decreases fluid production by inhibiting Norepinephrine transporter
- Roclatan (Aerie Pharmaceuticals)-Phase 3 trial
  - Combination of Rhopressa and latanaprost
- Ripasudil 0.4% -Phase 3 trial (approved in Japan)
-

25 **Selective adrenergic agonists (Trabodenoson) : increase TM outflow**

- Trabodenoson (Inotek Pharmaceuticals)
- Increases TM outflow, by selectively targeting A1 receptors on TM →stimulate proteases, that can lyse protein that is clogging TM
- In Phase 3 trial (09/2015) MATRX-1: qd and BID dosing
  - less conj hyperemia than PG
  - Phase 2: Lowers IOP 7 pts
- ALSO in trial: Trabodenoson-latanoprost
-

26 **Nitric Oxide(NO) : increase TM outflow**

- Latanoprostene bunod- NO-donating prostaglandin F2-alpha analog (Bausch & Lomb Vesneo)
- Increases TM outflow, by relaxing TM.. ?increase ocular blood flow??
- Completed Phase 3 trial (07/2015)
  - Phase 3: Lowers IOP 7 - 9 pts
- FDA review by 07/2016?
-

27 **FUTURE DELIVERY SYSTEMS OF MEDICATIONS**

- A novel prolonged delivery (month) of medications (contact lens, punctal plugs)
- Subconjunctival injections, Subtenon depots
- Conjunctival fornix inserts
- Nanoparticles, microspheres, liposomes –release medications slowly

28 **SELECTIVE LASER TRABECULOPLASTY (SLT)**
is an excellent choice in lowering IOP, if target goal not reached with monotherapy!

- COMPLIANCE IS NOT AN ISSUE!
  - 100% COMPLIANCE with SLT !!!!
- In general, cost-effective.
- In general, no side effects.
- No negative impact on quality of life.
- No peak/trough IOP fluctuations. FLATTENS DIURNAL CURVE.
- SLT decrease IOP an additional 3-4 mm Hg, on patients on topical PGs
-
-
-

29 **CATARACT SURGERY: lowers IOP**

- Lowering IOP :
  - 1-4 mm Hg decrease (Shingleton BJ et al, J Glaucoma 2006; 15:494-498.) Can be sustained for 3-5 years
  - 8 mm Hg decrease (Samuelson et al, Ophthalmology 2011; 118:459-467)
- Proposed mechanism: Enhance TM outflow
- Degree of IOP lowering correlates with extent of AC deepening. So, in patients with PACG or narrow angles: even more IOP lowering.
  (Huang et al. Arch Ophth.2011 Oct; 129 (10):1283-90)
-
-

30 **CATARACT SURGERY + Istent**
("Phaco +") Lowers IOP 2-3 mg more

- Additional Lowering IOP with 1 Istent :
  - 2-3 mm Hg additional decrease to cataract surgery
  - only FDA approved for 1 Istent , in conjunction with cataract surgery
    (2-3 Istents in Canada & Europe)
- Safety profile: SAFE! (compared to traditional glaucoma surgeries)
-
-

31

1 **Cataract Surgery in Fuchs' Dystrophy Patients**

Lisa D. Garbutt, M.D.
Coastal Vision Medical Group

2 **What is Fuchs' Dystrophy? Dystrophy**

- Autosomal Dominant Corneal Endothelial Dystrophy
- Usually affects both eyes
- Slightly more common in Females than in males
- early signs are seen in the 30's and 40's, but not usually clinically significant until the 50's and 60's

3 **Professor Ernst Fuchs (1851-1930)**

- Dr. Ernst Fuchs, an austrian ophthalmologist and head of the clinic of ophthalmology at the University of Vienna
- His "Textbook of Ophthalmology", published in 1889, was considered the bible of ophthalmology for over 50 years
- He was considered the master of his profession, who's extensive clinical studies provided the first descriptions and definitions of many conditions and diseases of the eye, over a dozen of which bear his name

4 **Fuchs' Dystrophy**

- In 1910, Fuchs first reported 13 cases of central corneal clouding, loss of corneal sensation, and the formation of epithelial bullae
- he labeled this condition "dystrophia epithelialis corneae"
- characterized by late onset, slow progression, decreased visual acuity in the morning, lack of inflammation, diffuse corneal opacity, and vesicle-like formation of the epithelium

5 **fuchs' dystrophy**

-
-
- It wasn't until the 1920's that a full understanding that fuchs' dystrophy was in fact an endothelial disease and not an epithelial disease was made, i.e. the endothelial changes preceded the epithelial changes

6 **guttatae**

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-
- guttatae, or "drops" are seen in the endothelial layer
- reflect a decrease in density of the major "pump" cells of the corneal that allow stromal clarity
- Progressive endothelial cell loss causes a relative influx of aqueous humor leading to corneal stromal edema
- The dystrophy is classified into different stages, ranging from early signs of guttatae, to end-stage subepithelial scarring

7 **effect on vision**

- The mechanism of potential visual compromise is really twofold: the thickness of the cornea and the optical reflectivity of the endothelium

8 **specular microscopy**

- Normal = uniform, small, hexagonal
- abnormal = decrease in cell density, larger cells which secrete excess amounts of descemet's membrane

9 **Anterior segment OCT**

- Endothelium produces excessive amounts of an abnormal basement membrane material resulting in a thickened Descemet's membrane
- Accumulations of this material result in mushroom like formations, called guttatae

10 **ultra high resolution OCT**

11 **endothelial cell trivia**

- Human endothelial cell density is 6,000 cells/mm2 during the first month of life, but decreases to 3,500 cells by 5 years of age, and to 2,300 cells by 85 years of age
- they are arrested in the G1 phase of the cell cycle, and do not divide

12 **endothelial cell trivia**

- contributes to the cornea as an exquisite example of natural engineering:
- It must control hydration while at the same time must be permeable to nutrients from the aqueous humor
- acts as a partial leaky barrier to fluid and nutrient movement into the cornea and as an active pump that moves ions and draws water out of the cornea ("pump-leak mechanism")

13 **cataract surgery and the corneal endothelium**

- after initial cell losses (usually within 5 days after surgery), the cell density decreases at an average rate of 2.5% per year for at least 10 years after surgery (4 times the rate of the unoperated eye)

14 **cataract surgery in fuchs' corneal dystrophy**

- a thorough diagnostic workup is essential, as is pre-op counseling and expectation management
- cataract surgery alone vs. combined CEIOL and DSAEK

15 **cataract surgery in fuchs' corneal dystrophy**

- corneal pachymetry (>640). as pachymetry is variable in the normal population, it should not be used as the sole determinant of corneal edema
- Endothelial cell count and morphology (specular microscopy), AS-OCT, UHR-OCT
- clinical exam with documentation of amount of gutattae, visible edema, +/- bullae,

+/- subepithelial haze, degree of visual loss and effect on activities of daily living and quality of life (patient's visual needs)
- density of cataract

16 **managing expectations**
- "but all my friends said they saw perfectly right after cataract surgery"
- educate your patient and establish honest expectations for them: a well-informed patient is the best determinant of a positive outcome
- #1: recovery time with fuchs' dystrophy may be slower than other typical patients
- #2: there is a chance the cornea may decompensate, necessitating a DSAEK

17 **surgical technique**
- bss plus
- "soft-shell" technique with viscoelastic: dispersive viscoelastic first followed by a cohesive viscoelastic to spread it over the endothelial cells
- low threshold for adding more viscoelastic if there is prolonged irrigation or ultrasound time
- maintaining a safe distance from the endothelium

18 **soft-shell technique**

19 **surgical technique**
- therapeutic femtosecond laser assisted surgery: can section the lens without ultrasound energy, dropping the amount of phacoemulsification energy considerably, making the procedure kinder to the endothelium
- aim -1.00 in anticipation of future DSAEK if risk higher (hyperopic shift with addition of tissue)

20 **femtosecond laser assisted for fuchs' dystrophy**
-
-
-
- Minimizes trauma to the corneal endothelium at the time of surgery
- performs the capsulorhexis, minimizing surgery time and exposure
- division of the lens has already taken place by the time the actual intraocular portion begins, reducing cumulative phaco energy exposure by up to 50%

21 **DSAEK?**
- Most patients have pretty decent endothelium, specular counts between 500 and 1,200/mm2, and pachymetry between 580 and 650 um, so cataract surgery alone may be enough

22 **decision to dsaek**
- If patients are outside those parameters, they may benefit from either a combined or sequential procedure
- However, there are a select few patients that are within the parameters for cataract surgery alone, but are still bothered by the endothelial reflectivity even before their cataract formed (glare with driving, lights, etc.)

23 **dsaek/dmek**
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- 170, 80, 20 microns

24 **questions**

- thank you!!

1

Retinal Care of the Myopic Patient Considerations for Refractive Surgery

Timothy You, MD
Orange County Retina Group
February 25, 2016

2 **Background**

3

Definitions

• Greek: μυωπία, *muōpía*, from myein "to shut (like a mole - mys/mus in Greek)" – ops (gen. opos) "eye, sight),
literal meaning "trying to see like a mole"
• Low myopia 0.00 to -3.00 diopters
• Moderate myopia: -3.00 to -6.00 dptrs
• High myopia: > -6.00 diopters

4

Background

•
•Global refractive error: 800 million to 2.3 billion
• Highest in Asia (70-90% Asian countries; 30-40% Europe and US; 10-20% Africa)
• Which country has highest prevalence?
• Lasik – 20 million since 1990
• US – 1 million procedures annually
•

5

Background
NEI NIH 2010 Data

6

Retinal Exam

7 **Slit Lamp Biomicroscopy to Assess Macula**

8

9 **Indirect Ophthalmoscopy**

10 **Depressed Sclera Examination**
Scleral Depressors

11 **Ophthalmoscopy**

12

#1 : Retinal Tears and Detachments

13 **Case**

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16 **Lattice Degeneration**

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Lattice Degeneration

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- Prevalence 7-8% of general population
- Prevalence 11-16% autopsy series
- Bilateral in 45% of cases; associated with myopia
- Risk for RD with lattice is 1%
- Risk for RD with lattice and holes 2%
- Risk for RD with symptoms 40%

18 **Lattice Degeneration**

19 **Lattice Degeneration w/ atrophic holes**

20 **Lattice Degeneration w/ Pigmentation**

21 **Case**

22 **Peripheral White Without Pressure**

23 **Peripheral White Without Pressure**

24 **Case**

25 **Retinal Hole w/Operculum Subretinal Fluid**

26 **Retinal Hole w/Operculum**

27 **Retinal Detachment**

28

Retinal Detachment

- Annual incidence 1:10,000-15,000
- OC 300-400
- Prevalence 45 in 15,000
- Risk Factors: Myopia >6dptr, Aphakia, Trauma, Vitreous Loss, Family Hx, Syndromes
- Risk for Fellow Eye is up to 15%
- Symptomatic PVD 6-12% Risk
- Vitreous Hemorrhage 70% Risk

29

Retinal Care of the Myopic Patient

- Ruiz-Moreno (2003)
- N= 9,253 patients
- RD risk 1:10,000 (<0.0001%) general pop
- RD risk 0.15% after PRK
- RD risk 0.36% after LASIK
- RD risk 4.08% after IOL
- RD risk 8.10% after IOL for pt > -10dptr
  - Colin (2008)

30 **Retinal Detachment**

31 **Retinal Detachment**

32 **Retinal Detachment**

33 **Horseshoe Retinal Tear**

34 **Horseshoe Retinal Tear**

35 **Treated Retinal Tear**

36 **Pneumatic Retinopexy**
SF6 or C3F8 Gas Tamponade
Cryo/Laserpexy

37 **Retinal Surgery**

38 **Retinal Surgery**

39 **Scleral Buckling**

40 **Traction Retinal Detachment**

41 **Alcon Constellation Vitrectomy**

42

#2 : Posterior Staphyloma

43 **Background**

44

Myopic Macular Degeneration
Myopic Fundus with Geographic Atrophy

45 **Case**

46 **Lacquer Cracks**

47 **Lacquer Cracks**

48 **Forster-Fuchs' Spots**

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Staphyloma
Hsaiang et al, AJO 2008

50 **Posterior Staphyloma**

51 **Degenerative Myopia**

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Staphyloma
Shinohara et al, 2013

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B-scan Posterior Staphyloma

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CT Scan Posterior Staphyloma

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OCT of Myopic Eye

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Anatomy of Myopic Eye

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External Staphyloma

58

Uveal Melanoma
Desai et al, JAMA 2013

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Myopic Macular Retinoschisis
Shimada et al, BJO 2008

60

Myopic Macular Detachment

61

Myopic Macular Detachment
Brian Ward, 2015

62

Myopic Macular Detachment
Posterior Pole Buckling
Ward, Retina 2013

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#3 : Myopic CNVM

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Myopic CNVM
- Ruiz-Moreno (2003)/Ohno-Matsui (2002)
- mCNV risk is approx 5.0% in myopes

- mCNV range from 3.7% for diffuse atrophy range to 29% lacquer cracks
- mCNV risk 0.01% after PRK
- mCNV risk 0.33% after LASIK
- mCNV risk 2.38% after IOL
- Retinal Hemorrhages and mac holes

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Myopic Choroidal Neovascularization CNVM

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Myopic Choroidal Neovascularization CNVM

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Myopic Choroidal Neovascularization CNVM

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Myopic Choroidal Neovascularization CNVM

69

Myopic Choroidal Neovascularization CNVM

70 **Case**

71 **Macular Hole**

Macular Pucker

Vitreomacular Traction

72 **Clinical Pearls**

- Symptomatic PVD w/o breaks – see patient within one month or refer
- Symptomatic PVD w/ break – refer within 48 hours
- Symptomatic PVD w/ heme – see patient within 1-2 weeks or refer –high risk for RD
-

73 **Clinical Pearls**

- Loss of central vision (inability to refract better than baseline) - refer
- Metamorphopsia – get OCT and look

for CNVM or atrophy

- Patient with Multiple Questions – refer or decline elective surgery
-

74 **Guatemala**

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79 Zika Virus

80

81 Microcephaly

82 Microcephaly

83 JAMA Ophthalmology

84 2-month-old girl

85 1-month-old boy

86 1-month-old infant

87 1-month-old infant

88 20-day-old infant

89 Rubella

90

91

92

93

94 Thank You!

1 **Management of Corneal Ulcers**

Lisa D. Garbutt, M.D.
Dan B. Tran, M.D.
Coastal Vision Medical Group

2 **Profiling the Ulcer**

Infectious vs. Non-Infectious
Infectious: Bacterial (Staph, Pseudomonas), Fungi (Candida, Fusarium), Viral (Herpes), Parasitic (Acanthamoeba)
Non-Infectious: Neurotrophic, Autoimmune, Toxic, Allergic, Mechanical

3 **Profiling the Ulcer: Detailed Patient History**

? Contact Lens Wearer
?Pain and Quality of Pain
- FBS/ "Stick in the eye": Bacterial with Epithelial Defect
- "Toothache in Eye", "Only when light hits my eye does it really hurt": Non-Bacterial or Non-Infectious
- Pain out of proportion to exam: Acanthamoeba
- Less pain than one would expect from findings: Herpes

4 **Profiling the Ulcer: Context**

? Contact lens wearer
Do you swim in your contacts or wash in tap water?
Have you been gardening, been exposed to vegetation, dirt, wood?
History of previous episodes (herpes)

5 **Culturing the Ulcer**

With the introduction of fluoroquinolone antibiotics, some clinicians have dropped culturing as part of their diagnositic practice
Ok for small peripheral ulcers
You'll want to culture central ulcers or ulcers larger than 2mm at presentation

6 **When to Refer**

No improvement in 1-2 days if peripheral
Ulcer larger than 2mm, especially if located in visual axis, +/- stromal melting, anterior chamber inflammation, scleral involvement, or any suspicious or atypical presentation

7 **BACTERIAL**

Relatively straight forward in most cases: CTL wearer, severe pain started 2 days ago, injected eye with epithelial defect over a small, round infiltrate, +/- purulent discharge.

8 **BACTERIAL**

For small peripheral ulcers - frequent dosing of topical fluoroquinolones (Vigamox). 1 drop every 5 minutes for first 30 minutes (loading dose), then every hour around the clock.
For ulcers >2mm or near visual axis, or a peripheral ulcer that is not responding: Fortified Antibiotics (Vancomycin, Tobramycin) - one drop on the hour, the other drop

on the 1/2 hour around the clock for the first 48 hours). After 24, hours, may ease up on overnight drops to every 2 hours if see improvement

9 **BACTERIAL**

Steroids: Use with extreme Caution and only once response to antibiotics and control of infection is established. Epithelial defect is starting to close, usually within first 48 hours if there is marked haze/inflammation near visual axis.
Steroids inhibit the inflammatory response and reduce corneal scarring

10 **Staphylococcal**

11 **MRSA**

Classic-looking bacterial ulcer not responding to fluoroquinolones
At risk groups: Nursing home residents, in-patients, hospital or health-care worker

12 **Pseudomonas**

Characteristically soupy, necrotic, +/- hypopyon

13 **FUNGAL ULCERS**

More indolent appearing, chalky, long-standing, possible history of agricultural injury or CTL wear in humid conditions
Molds: Feathery borders, +/- satellite lesions
Yeasts: More distinct borders and localized, resemble bacterial ulcers
Neovascularizaion (reflecting chronicity)
Pain and inflammation not as severe as bacterial

14 **Fungus**

Natamycin: Every hour initially, then taper according to response.
Does not penetrate intact epithelium, so may need to debride first
More activity agains Fusarium Molds, less activity against Candida Yeasts
For Candida, may need to compound Amphotericin or Voriconazole
Requires medication for six weeks on average

. Cannot penetrate intact epithelium that well, so need to remove epithelium.
Natamycin more efficacious against Fusarium mold. Less efficacy against Candida yeast. May need to go with a compounded Amphotericin or Voriconazole.
Treatement for 6 weeks on average

15 **Parasitic: Acanthamoeba**

CTL wearer, History of swimming in pool with CTL's, washing lenses with tap water, agricultural injury
Initially may masquerade as a stromal Herpetic Lesion
In contrast to Herpes, the pain is out of proportion to the clinical findings with exquisite light sensitivity

16 **Acanthamoeba**

"Jacket-over-the-head" sign
Epithelial irregularity early on, later a ring infiltrate with perineural infiltrates
Very difficult to culture. Other options are Confocal Microscopy and Corneal Biopsy

17 **Acanthamoeba: Double-walled cyst**

Light Microscopy and Confocal Microscopy

18 **Confocal Microscopy**

- Aims to overcome some limitations of traditional wide-field fluorescence microscopes.
- Confocal Microscopy uses point illumination and a pinhole to eliminate out-of-focus light, improving optical resolution.

19 **Confocal Microscopy**

- Only one point in the sample is illuminated at a time, so 2D or 3D imaging requires scanning over a regular raster (a rectangular pattern of parallel scanning lines) in the specimen.
- Image comes from a thin section of your sample (small depth of field).
- By scanning many thin sections, you can build up a very clean three-dimensional image of the sample.

20 **Confocal Microscopy**

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-
-
-
- Acanthamoeba cysts appear as small, round transparencies, and Fusarium hyphae appear as linear transparencies

21 **Acanthamoeba**

Treatment: Compounded Chlorhexidine and Polyhexamethylene biguanide (PHMB).
Organisms are difficult to erradicate, requiring medications anywhere from 3 months to a year.
Most patients require corneal transplantation.

22 **HSV**

Typical dendrite
+/- Decreased Corneal sensitivity

23 **HSV Spectrum**

Epithelial keratitis: Live virus invades and replicates in corneal epithelium
Stromal keratitis: Not an infection with live virus, but rather an inflammation caused by the immune response to dead viral particles. May have an endotheliitis with increased pressure
Neurotrophic keratitis: a few bouts of active keratitis kills off more nerves that supply corneal sensitivity

24 **HSV Treatment**

Epithelial: Topical Viroptic (Trifluridine) every 2 hours (9x/day), vs. Topical Zirgan (Gancyclovir) 5 times a day
+/- Oral Acyclovir, Valacyclovir, and Famciclovir may shorten course or provide prophylaxis of future episodes
Topical antibiotic vs. antibiotic ointment at bedtime to prevent bacterial superinfection

25 **HSV Treatment**

Stromal: Topical Steroids
Oral Antivirals usually given as prophylaxis to prevent spontaneous recurrence of epithelial disease while patient on steroids
Do not need topical antivirals in Stromal disease (no live virus)

26 **HSV Treatement - Special Cases**

HSV Necrotizing Keratitis: both stromal inflammation and live virus present - epithelial defect and stromal thinning. Tightrope management of anti-virals and steroids.

27 **Non-infectious ulcers**

Staph Marginal Keratitis: associated blepharitis
Auto-immune related Keratitis: Rheumatoid arthritis, Sjogren's Syndrome
Neurotrophic Ulcers: Diabetes, HSV, chemical burns, overuse of topical anesthetics (anything that can cause decreased corneal sensitivity)

28 **Staph Marginal Keratitis**

Multiple small peripheral sterile infiltrates, separated from limbus by clear space
May see meibomian gland disease, scurf, etc.

29 **Staph Marginal Keratitis**

Very responsive to steroids

Tobradex vs. Maxitrol QID OU
Contact Lens Vacation
Treat lid margin disease: Erythromycin ointment or Azasite to lashes QHS OU, gentle lid hygiene 2-3x/week

30 **Auto-immune Keratitis**
(PUK - Peripheral Ulcerative Keratitis)

Imperitive to get Rheumatologist on board for Oral Prednisone vs. Steroid-Sparing Systemic Medication. Need to treat underlying systemic disease ASAP. (Rheumatoid Arthritis most common)

31 **Autoimmune Keratitis**

Can progress rapidly to stromal melting and perforation
Systemic modulation is required, topical steroids are contraindicated. May support surface with gentle topical antibiotics and aggressive lubrication
+/- Oral Doxycycline to slow down melting

32 **Autoimmune disease in Clinical Practice**

- Never place a patient (post op or otherwise) with a history of Rheumatoid Arthritis on topical NSAIDS.
- Those patients more than anybody else can develop a corneal melt very quickly

33 **Neurotrophic Ulcers**

Boat-shaped epithelial defect with rolled, gray edges, usually long-standing, minimal inflammation but possible haze
Poor corneal sensation

34 **Neurotrophic ulcers**

- Decreased production of tears
- Damaged Corneal nerves cannot produce the necessary growth factors necessary for healing
- Lifelong battle, can recur over and over again
- HZO, hx HSV, Diabetes, Multiple surgeries can damage CN V, Anesthetic abuse, Severe Sjogren's syndrome

35 **Neurotrophic Ulcers**

Lubrication with artificial tears, ointments, +/- punctal plugs. (Prevent initial breakdown which gets cycle going)
Bandage contact lenses
Topical antibiotics to prevent superinfection
Oral Vitamin C
+/- Oral Doxycycline if stromal thinning evident

36 **Adjunctive Approaches**

Providing surface support:
Amniotic Membrane graft/Prokera lens
Punctal occlusion
Autologous serum tears
Gentle steroids if HZO
Bandage contact lenses
Tarsorrhaphy

37 **Thank You**

Questions

1 **THE NEW AGE**
OF
REFRACTIVE CATARACT PATIENTS

Dan B. Tran, MD
Anterior Segment – Cataract – Cornea – Refractive Surgery Specialist
Medical Director Coastal Vision Medical Group
Lisa D. Garbutt, MD
Anterior Segment – Cataract – Cornea – Refractive Surgery Specialist
March 2016

2 **Acknowledgement**

- My special thanks to Dr. Tim You, Orange County Retina Group, for the slides on retinal pathology

3

4

5

6 **Getting to Know Today's Presbyopic Patient**

- Large, rapidly growing demographic
  (i.e., baby boomers)
- Educated, financially secure
- Increased life expectancy
- Longer working careers
- Are unwilling to compromise active lifestyle
- Embrace demand-driven healthcare
- Demand high quality vision (e.g., reading, distance, night)
- Have new requirements for intermediate vision (e.g., computers)
-

7 **LENS REPLACEMENT SURGERY:**
Presbyopic Patients Candidacy?

8 **How Accurate is IOL Refractive Outcomes?**

- Axial length of the eye
-
- Average Corneal Power and Astigmatism
  – Corneal Astigmatism (for outcomes)
- Effective IOL position prediction
  –
- For advanced formulas
  – White-to-white
  – Lens thickness
  – Anterior chamber depth

9 **Importance of Preop Biometry and Keratometry**

- 43-67% of large refractive surprise due to inaccurate preoperative measurement (axial length or keratometry)[1,2]
- 1mm AL error = approx. 3 D error
  - In a normal axial length eye at 23mm
- 1D K error = 1 D IOL error
- Remove hard contact lens > 2 weeks before measuring corneal power
-

10 **Myopic LASIK**

11 **Factors Affecting IOL Predictability[1]**

1. If IOL is 0.5 mm posterior to the assumed plane, a 21 D lens will produce only 20 D of correction
   -
   -
2. If IOL is 0.5 mm anterior to the assumed plane, a 21 D lens will produce 22 D of correction
   -

12 **IOL Choices 2016**

- Monofocal IOL
  - Spherical IOL
  - Aspheric Spherical Aberration Reduction IOL
  - Toric IOL
- Multifocal IOL
  - Alcon ReStor™ Apodized Diffractive Optic
  - AMO Tecnis™ Multifocal Diffractive Optic
- Accomodative IOL
  - Bausch + Lomb Crystalens™ and Trulign™

13 **Toric IOL: AcrySof and AMO Tecnis**

- Single-Piece IOL effectively addresses astigmatism when correctly positioned in the eye
  - superior stability and centration
  - low secondary complication rate
- AcrySof Spherical Power Range - +6 to +30 D

14 **Simulated vision to illustrate the effect of astigmatism on monovision**

15 **Toric IOL Case**

- Patient E.S.
  - 75 yo M with 3+ NSC OS
- Pre-Op Refraction: -5.75 +2.50 x 176°
- Pre-Op Biometry
  - IOL Master 1.34@176°
  - Pentacam 1.64@173°
  - Galilei 0.95@169°

- Atlas 1.31@176°
-

16 **Toric IOL Case**
- IOL Placed
  - Alcon SN6AT4 in the bag at 175 to correct 1.5D cyl

17 **Toric IOL Case**
- POM 1
  - UCVA: 20/60
  - Post-Op Refraction: -2.25 +1.00 x 165
  - BCVA 20/20
  -
  - Undercorrection by 1D

18 **Factors to Toric IOL Implantation**
- 1. Measuring the magnitude and axis of astigmatism in the cornea
-
- 2. Finding the correct axis on the patient's cornea intraoperatively
-
- 3. Lining up the IOL accurately in that axis

19 **Stability and Precision**
(1° = 3.3% loss of cylinder power)

20 **Preoperative Keratometry: Why do Measurements Differ?**
- Manual and autokeratometry
  - 4 points, 3-3.2 mm zone
- IOL Master
  - 6 points, 2.5 mm zone
- Lenstar
  - 32 points, 2 zones (1.65mm/2.3mm)
- Topography
  - >500 points, values averaged over central 3-4mm
- Scheimpflug imaging combined with placido disc topography
  - Pentacam, Galilei

21 **Which is method is best?**
- Topography
  - Pros: accurate anterior surface contour
  - Cons
    - No posterior surface information
    - Data dropout in distorted/irregular corneas
-

22
- Tomography
  - Pros
    - Posterior surface information
    - Accurately measures distortions and aberrations

- Cons
  - Topography map derived from corneal section slices

23 **Which method is best?**

- Color LED topographers
  - Cassini, i-Optics
  - Pros
    - Does not use edge detection
    - Regular or irregular corneas
    - Poor tear film
    - Instantaneous capture
    - Axis accuracy
  - Cons
    - No posterior surface information
    - Requires further clinical validation studies
    -
  -

24 **Which method is best?**

Am J Ophthalmol, 2009

25 **Which method is best?**

Korean J Ophthalmol, 2012

26 **Which method is best?**

- Measurement errors can be dramatically reduced by averaging measurements from manual keratometry with any automated technology

27 **Effect of posterior corneal astigmatism**

- With age, anterior corneal astigmatism trends towards ATR astigmatism
- Posterior corneal astigmatism remains relatively constant
- Effective minus lens → additional ATR
- Corneal astigmatism calculated from anterior corneal surface measurements only
  - WTR group: mean over-correction of 0.5 D
  - ATR group: mean under-correction of 0.3 D
-
-

28 **How accurate are we?**

1. FDA Clinical Trial for Alcon AcrySof IQ Toric IOL available at: http://www.alconsurgical.com/pdfs/TOR240.pdf
2. Potvin, et al. J Refract Surg., 2013.
3. Ahmed II, et al. J Cataract and Refract Surg., 2010.
4. Mendicute, et al. J Cataract and Refract Surg., 2008.

-

29 **Room for Improvement**

- Image overlay intraoperatively
  - Verion System at La Veta Surgery Center in Orange
    - First in Southern California
- Intraoperative aberrometry
  - ORA (WaveTec Vision)
  - Holos (Clarity Medical Systems)
- Even with these devices, we still need a pre-operative IOL plan

–
–

30 **MANAGING ASTIGMATISM**

- Don't over look manual keratometry
- Use multiple devices
- Remember posterior corneal astigmatism
- Push for new technologies

–
–

31 **ORA System® w/VerifEye™: *Designed to Optimize Every Cataract Procedure***

ORA's all new Optiwave™ technology takes intraoperative wavefront aberrometry to a *new level of precision* providing surgeons a *higher level of confidence*

32 **Keratometric vs. Refractive Cylinder**

- Recent Work Using Devices That Measure Both the Anterior and Posterior Corneal Curvature Shows a Cylinder Contribution From the Posterior Corneal Surface (first recognized by Javal in 1890)
  - ARVO 2011 Presentation by Li Wang, Shazia Ali, Mariko Shirayama, Mitchell Weikert and Douglas Koch
  - J Cataract Refract Surg, 38:2080-2087, 2012

33 **How Well Would Baylor Nomogram Work on This Data Set?!**

34 **Sample Case 1 – WTR Astigmatism**

35 **Sample Case 2 – ATR Astigmatism**

36 **The ORA Toric IOL Rotation**

37 **Improved astigmatic outcomes with VerifEye®**

38 **Improved astigmatic outcomes with VerifEye®**

39 **Presbyopia Correcting IOL**

Dan B. Tran, M.D.
COASTAL VISION MEDICAL GROUP
Long Beach – Newport Beach - Orange

40

41 **TRULIGN™ Toric IOL**

Now we have a new member of the Crystalens family that builds on the AO model but adds astigmatic correction.

42 **AcrySof® IQ ReSTOR® IOL**

43 **Allocating Light Energy According to Activity**

44 **Mean Visual Disturbances**
3 Month Data

45

46

47 **TECNIS® Multifocal Acrylic IOL**
Model ZMA00 Specifications

- Full diffractive posterior surface
  - Pupil-independent
  - Designed to reduce chromatic aberration at near
- Wavefront-designed aspheric anterior surface
  - Designed to correct spherical aberration to zero
- Optical power add +4.0D
  - To optimize acuity at preferred reading distance of 33 cm

48 **Full Diffractive Surface = Pupil Independence**

49 **Depth of Focus: Mean Visual Acuity for Multifocal Subjects by Pupil Size**

50 **TECNIS® Multifocal Family of IOLs**

51 **TECNIS® Multifocal Family of IOLs**
Clinical Outcomes

52 **TECNIS® Multifocal IOLs +3.25 D and +2.75 D**

53 **TECNIS® Multifocal IOLs +3.25 D and +2.75 D**
Clinical Outcomes

54 **TECNIS® Multifocal IOLs +3.25 D and +2.75 D**
Clinical Outcomes

55

56 **TECNIS® Multifocal IOL +4.0 D**
(ZMB00)

57 **TECNIS® Multifocal IOL +4.0 D**

58

59 **TECNIS® Multifocal IOL +3.25 D**

60

61 **TECNIS® Multifocal IOL +2.75 D**

62 **TECNIS® Multifocal Family of IOLs**
Binocular Defocus Curve at 6 Months

63 **LASIK Retreatment Rate**

64 **The Need for Improvement**

65 **Alcon LenSx Laser**

- Femtosecond Laser
- Integrated OCT
- Universal Curved Patient Interface
-
- First femtosecond laser cleared for an indication in cataract surgery

- FDA approvals
  - Capsulotomy
  - Laser Phacofragmentation
  - Cataract Incisions

- CE mark
  - Capsulotomy
  - Laser Phacofragmentation
  - Cataract Incisions

66 **Laser Refractive Cataract Surgery – LenSx® Laser System Docking and FS Laser Treatment**

67 **Femtosecond Laser Cataract Surgery**

68 **Does Capsulotomy Size Impact ELP?**

Consistent capsulorhexis diameter is critical to
Effective Lens Position[1,2]

- A 4 mm capsulorhexis results in longer post-operative ELPo than does a 6 mm capsulorhexis for the type of IOL used [3]
-
- To ensure that an IOL's position in the bag matches the anticipated formula used to calculate its power, the capsulorhexis should be round, centered and smaller than the IOL optic[2]

69 **Comparative IOL Refractive Outcomes with Femtosecond Laser Assisted Refractive Cataract Surgery**

Dan B. Tran, M.D.

Long Beach – Newport Beach - Orange

70 **Accuracy to Target distribution**

71 **Accuracy to Target distribution – Accommodating**

72 **6 Months Postop Aberration Comparison**

73 **Inflammation: A Common Concern**

- Approximately 5 million ophthalmic surgeries are performed annually in US[1]
  - Postoperative inflammation is a common occurrence after these procedures[2]
- Despite surgical advances, most patients will present with some degree of postoperative inflammation.[2,3]
  - Some patients are more susceptible
  - Every patient displays inflammation differently
  - Cannot predict severity
- Under-treatment, delayed treatment, or lack of treatment can lead to:[3]
  - Decreased visual acuity
  - Pain & discomfort
  - Photophobia
  - Corneal edema
  - Cystoid Macular Edema
  - Glaucoma

74 **The Inflammatory Cascade**

75 **Refractive Challenging Cases**

Dan B. Tran, M.D.

Long Beach – Newport Beach – Orange

76 **Assessing Topography**

77 **Case Study 1...**

- 63 y/o male contractor needs better near vision, glasses are difficult to work with, contact lens is not an option with dust etc...
- MR OD +2.00 20/20 OS +2.00 20/20
- Right eye dominant

78 **...Case Study 1**

- Refractive Lens Exchange
  - ReStor 3 Add OS
    - Not enough near vision J2
  - ReStor 4 Add OD
    - Near vision 20/20 OU

– Uncorrected distant visual acuity 20/15-2 OD; 20/15-1 OS

79 **TOTAL ABERRATIONS**

- Right Eye 5.31mm pupil
  - MR Plano-0.25x089 20/15-2
  - WF HOA Coma 0.10 SA 0.03 Other 0.19
  - Cornea HOA Coma 0.130
- Left Eye 5.65mm pupil
  - MR Plano-0.25x122 20/15
  - WF HOA Coma 0.28 SA 0.14 Other 0.40
  - Cornea HOA Coma 0.181

80 **Case Study 2 - Post Myopic LASIK**

- 55 y/o male with polyopia from cataract
- S/P LASIK OU 1997
- Keratoconus suspect 2005
- OCT Corneal Thickness
  - 176 Microns Flap; 323 Microns Stromal Bed OD
  - 148 Microns Flap; 320 Microns Stromal Bed OS
- OD: -2.25-1.50x067; K's 41.75/42.75x147 20/30
- OS: -1.75-1.75x108; K's 42.75/45.00x020 20/40

81 **Corneal Analysis iTrace Right Eye**

82 **Corneal Analysis iTrace Left Eye**

83 **Post Op with Toric IOL**

- OD UCVA 20/20+ BSCVA 20/15-2
  - MR +0.25-0.25 x 070 SN6AT3 18.5D
- OS UCVA 20/25 BSCVA 20/20
  - MR +0.25-0.75 x 096 SN6AT5 19.5D
- OU UCNVA 20/25

84 **S/P ALK –Topo-Guided PRK followed by LenSx Cataract Surgery ORA™Guided IOL Selection**

- EO 57 y/o Male Dentist
- S/P Myopic ALK in Mexico over 20 years ago
- UCVA CF at 2ft
- SCL -20D OU with 20/200 OD
- Over-refraction -16.0D
  - -3.50-3.00 x 060 20/50 "Blurry" with 2+ NS
  - -3.25-2.50 x 127 20/50

85 **OrbScan Pre-Op**

86 **OrbScan Pre & Post Topo Guided PRK**

87 **Recommendations on Approaches for Clinical Practice Adaptation**

- Refractive Surgery Practice
  - More similarity to LASIK practice
  - Patients education and informed consent process are critical

- Patient Selection
  - No ocular co-morbidity
  - Candidacy similar to candidate for multifocal IOL or toric IOL
    - Aggressively treating any peri-operative ocular co-morbidity
      - Dry eyes, blepharitis, residual refractive errors if present
      - Monitor for any evidence of CME closely
- Do NOT make excuses for suboptimal refractive outcomes... FIX IT!
  - LASIK enhancement as needed
-
-

88 **How to discuss these technologies**

1)Assess the patient's medication condition
  a)Ensure no ocular pathology except cataract
  b)
2)Determine patients visual needs
  a)IOL choices to match up with lifestyle needs
    a)Monofocal vs. toric vs. multifocal IOL
    b)Monovision candidate
    c)
3)Discuss surgical approach
  a)Astigmatism Management
  b)Discuss the benefits and risks of femtosecond laser refractive surgery
  c)
4)Discuss intra-operative aberrometry (ORA™)
5)
5)Discuss the need for other methods to hit refractive target
  a) LASIK Treatment at 3 months if needed

89 **PREOPERATIVE EVALUATION**

- DETAILED HISTORY WITH LIFESTYLE ASSESSMENT
- COMPLETE EYE EXAMS INCLUDING EVALUATION
  - DRY EYES AND EXTERNAL DISEASES ASSESSMENT
  - PUPIL SIZE EVALUATION
  - CORNEAL TOPOGRAPHY AND PACHYMETRY
  - OCT OF MACULAR
  - FUNDUS EXAM OF MACULAR AND PERIPHERAL RETINA
    - RETINA CLEARANCE FOR HIGH MYOPES
  - VISUAL FIELD AND OCT NERVE FIBER LAYER ANALYSIS FOR GLAUCOMA PATIENTS
- INFORMED & CONSENT PROCESS DISCUSSING EXPECTATIONS, RISKS AND BENEFITS, POTENTIAL FOR ENHANCEMENT SURGERY
- PROPHYLACTIC USE OF TOPICAL ANTIBIOTICS, NSAIDS
  - DRY EYE AND BLEPHARITIS TREATMENT AS NEEDED

90 **POSTOPERATIVE MANAGEMENT**

- VISUAL ACUITY AND MANIFEST REFRACTION
- DRY EYE AND BLEPHARITIS ASSESSMENT
- CORNEAL STATUS ASSESSMENT

- IOP MONITORING WHILE ON STEROIDS DROPS
- CYSTOID MACULAR EDEMA MONITORING WITH OCT
- VISUAL SYMPTOMS DISCUSSION AND REASSURING
- DISCUSS ANY SPECTACLES NEEDS
- DISCUSS TIMING AND NEEDS FOR SECOND EYE SURGERY
- TRANSFER OF CARE PROCESS
- POSTOPERATIVE MEDICATIONS INCLUDING ANTIBIOTIC , STEROIDS, NSAID, IOP LOWERING MEDS MOSTLY TOPICAL
-

91

92

93 **Retinal Detachment**

94

Retinal Detachment

- Annual incidence 1:10,000-15,000
- OC 300-400
- Prevalence 45 in 15,000
- Risk Factors: Myopia >6dptr, Aphakia, Trauma, Vitreous Loss, Family Hx, Syndromes
- Risk for Fellow Eye is up to 15%
- Symptomatic PVD 6-12% Risk
- Vitreous Hemorrhage 70% Risk

95

Retinal Care of the Myopic Patient

- Ruiz-Moreno (2003)
- N= 9,253 patients
- RD risk 1:10,000 (<0.0001%) general pop
- RD risk 0.15% after PRK
- RD risk 0.36% after LASIK
- RD risk 4.08% after IOL
- RD risk 8.10% after IOL for pt > -10dptr
  - Colin (2008)

96 **Retinal Detachment**

97 **Treated Retinal Tear**

98 **Lacquer Cracks**

99 **Lacquer Cracks**

100

101 **Macular Hole**

Macular Pucker

Vitreomacular Traction

102 **Clinical Pearls**

- Symptomatic PVD w/o breaks – see patient within one month or refer
- Symptomatic PVD w/ break – refer within 48 hours
- Symptomatic PVD w/ heme – see patient within 1-2 weeks or refer –high risk for RD
-

103 **Clinical Pearls**

- Loss of central vision (inability to refract better than baseline) - refer
- Metamorphopsia – get OCT and look

for CNVM or atrophy

- Patient with Multiple Questions – refer or decline elective surgery
-

104 **CYSTOID MACULAR EDEMA**

105 **HYPOPYON**

106 **LOOSE SUTURES**

107 **DENDRITE**

108 **IRREGULAR ASTIGMATISM**

109 **BULLOUS KERATOPATHY**

110 **CORNEAL GRAFT REJECTION**

111 **Today's Cataract Patient is Complex**

112

1 **CURRENT TRENDS IN RETINAL IMAGING**
Eugene Chang, MD, MBA
March 15, 2016

2 **Optical Coherence Tomography**
- First introduced in 1996 as a research tool
- Gained wide acceptance in 2002
  - 3rd generation Stratus
- Further advancement with spectral domain OCT - 2006
  - Resolution = 3-7 microns
  - 20,000 – 52,000 A-scans/second

3 **Optical Biopsy**

4 **OCT Layers of the Retina**

5 **Outer Retinal Bands**

6 **Interpretation**
- Quantitative
  - Color coded and numerical displays
  - Reflect calculated thickening or thinning
- Qualitative
  - B-scan slices
  - General appearance

7 **Qualitative Evaluation**
- Foveal depression or thickening
- Abnormal areas of hypo-reflectivity
- Abnormal areas of hyper-reflectivity
- Look at all scans - pathology sometimes only in a single scan

8 **Different Systems (SD-OCT)**

9 **Different Systems**

10 **3-D reconstruction**

11 **EDI**

12 **Examples**

13 **Non-neovascular AMD**

14

15 **Geographic Atrophy**

16 **Neovascular AMD**

17 **Choroidal Neovascular Membrane**
- Look for "highly reflective sub-retinal/sub-RPE" material

18 **Pigment Epithelial Detachment (PED)**
- Represents neovascular activity
- Reflectivity
  - Hyper = drusenoid
  - Mixed = fibrovascular
  - Hypo = serous
- Resistant to anti-vegf
- Usually doesn't reflect vision potential

19 **RPE Tear/Rip**
- Spontaneous or following treatment
- May present with sudden drop in VA
- Often occurs at apex of PED
- Treatment
  - Continue treating neovascularization

20 **Outer Retinal Tubulation (ORT)**
- Represents rearrangement of photoreceptors in response to injury
- Seen in several retinal conditions
  - AMD most common
- Hyper-reflective border = ellipsoid layer

21 **Angioid Streak**

22 **Vitreomacular Adhesion**

23

24 **Vitreomacular Traction**

25 **Macular Hole**

26 **Lamellar Macular Hole**

27 **Epiretinal Membrane**

28 **Patient HC**

29 **Patient HC**

30 **Patient HC**

31 **Patient HC**

32 **Patient HC**

33 **Fundus Autofluoresence**

34 **Fundus Autofluoresence (FAF)**
- Derived from lipofuscin accumulation within the RPE

- Incomplete degredation/processing of photoreceptor outer segments
- Affected by absorbing or autofluorescent material anterior to RPE
- Excitation = 488 nm Filter = 500 nm

35 **FAF Utility**
- Provides information beyond what's obtained from fundus photography, FA, and OCT
- Simple, efficient, and noninvasive
- Understanding pathophysiologic mechanisms
- Diagnosis
- Phenotype-genotype correlation
- Identifying predictive markers for disease progression
- Monitoring new therapies

36 **FAF**
- Normal
  - Increases with age
  - Maximum intensity 7 to 15 degrees from fovea
  - Fovea is appx. 1/3 the intensity of max
    - Lutein and zeaxanthin absorption
- Optic disc and blood vessels = dark

37 **Normal FAF**

38 **Drusen**

39 **Geographic Atrophy**

40 **Optic Disc Drusen**

41 **Plaquenil Toxicity**

42 **Atypical Plaquenil Toxicity**

43 **Future Direction of Retinal Imaging**

44 **Ultrawidefield Imaging**
- First fundus camera = 20°
- Standard = 55°
- Heidelberg = 102°
- Optos = 200°

45 **Swept Source Technology**
- Longer Wavelength Imaging
  - Use wavelength of 1050nm

- Reduced attenuation from scattering
- Allows imaging through dense lens opacities
- Photodetectors vs. CCD
- Scan speed 2x
- Images vitreous, retina, and choroid – from nerve to macula

46 **Swept Source Technology**

47 **En face Imaging**

48 **OCT Angiography**

1 **DIAGNOSING GLAUCOMA : THAT IS THE QUESTION"** **"TO START OR NOT TO START?**

Betsy Bao-Thu Nguyen, M.D.

2 **CASE PRESENTATION #1**

- CH is a 44 yo active Asian male lawyer referred by his optometrist, with a new optic disc hemorrhage OD with IOP of 17 mm Hg.

IS THIS GLAUCOMA?

3 **CASE PRESENTATION**

- Va : 20/20 OU , myope (-5.50 OU)
- IOP (applanation): 17 OU @ 1pm (Tmax= 18)
- Pachy: 587 microns OD and 584 OS
- Gonio: Grade IV, open to CBB
- Slit Lamp: unremarkable, except mild SPK and blepharitis OU (no Krukenberg spindle, no pseudoexfoliation).
- Denies Family History Glaucoma
- NO steroids/no trauma.

4 **Fundus Photos**

1. OD
2. OS

5 **OPTIC DISC HEMORRHAGE DIFFERENTIAL DIAGNOSIS**

- Glaucoma– usually indicates active disease and possible sign of progression ("Drance hemorrhage"—splinter heme)
  - Drance SM, Fairclough M, Butler DM, Kottler MS. The importance of disc hemorrhage in the prognosis of chronic open angle glaucoma. Arch Ophthalmol 1977;95:226-228
- Diabetes
- Hypertension
- Acute vitreous detachment
- Trauma

- Diurnal variations
- Dependent on central corneal thickness
- Other IOP measurement inaccuracies(LASIK, PKP, tight Asian lids)
- NCT vs. tonopen vs. applanation

6 **OPTIC DISC HEMORRHAGE "Drance Hemorrhage"**

- Glaucoma– usually indicates active disease and possible sign of progression ("Drance hemorrhage"—splinter heme) Drance SM, Fairclough M, Butler DM, Kottler MS. The importance of disc hemorrhage in the prognosis of chronic open angle glaucoma. Arch Ophthalmol 1977;95:226-228
  - Typical: flame or splinter shaped, with feathered ends , radially oriented, and perpendicular to disc margin
  - Often occur adjacent to an area of previous damage, at the border of disc in NFL/ or at notch/ or at area of PPA
  - 2/3 of them occur inferotemporally
  - (NOT related to glaucoma , if swollen disc as in ischemic optic neuropathy, or seen with Diabetic retinopathy, or BRVO /CRVO)

7 **OPTIC DISC HEMORRHAGE**
"Drance hemorrhage"

- Seen in all types of glaucoma: OHT, NTG, advanced POAG, early POAG, CNAG, PXG
- Is it more common in NTG & adv POAG???
- Is it more common in glaucoma pt with thin CCT?
- Resolves spontaneously within 1-6 months (avg= 2-3 months)
- Can be easily missed on exam, unless you are looking for it
  (OHTS study: 4x as many Disc Heme found on FUNDUS photos as on standard exam)

8 **OPTIC DISC HEMORRHAGE**
"Drance hemorrhage"

- Take Fundus photos to document and compare
- Think definite glaucoma in previous POAG suspect ?
- Think progression in NTG and adv POAG
- Think diurnal fluctuation ?
- Think resetting the target pressure range?
- Think non-compliance?
- Change and Modify current treatment: More glaucoma meds vs. ?SLT vs. glaucoma trabeculectomy

- Diurnal variations
- Dependent on central corneal thickness
- Other IOP measurement inaccuracies(LASIK, PKP, tight Asian lids)
- NCT vs. tonopen vs. applanation

9 **OPTIC DISC HEMORRHAGE**
"Drance hemorrhage"
- Think need for closer Follow-up
- Monitor for recurrent optic disc hemorrhage
- Recurrent disc heme
  - Observed in 67% patients with NTG
  - Observed in 29% patients with POAG
  - Observed in 67% patients with glaucoma suspects
- W/U for Anemia
- W/U for Sleep apnea
- W/U for Nocturnal hypotension

10 **Fundus Photos**
1 OD
2 OS

11 **CIRRHUS OCT-RNFL**

12 **HVF 24-2 SITA STANDARD**
(1ST ONE EVER TAKEN BY PATIENT)
1 OD
2 OS

13 **CASE PRESENTATION**
TO START OR NOT TO START?

14 **THE RISK FACTORS ARE IMPORTANT IN THE DIAGNOSIS OF POAG**
- Increasing AGE
- Ethnic group
- Family History
- Thin Central Corneal Thickness
- IOP
- Low Ocular Perfusion Pressure (Sleep apnea, noctural hypotension)
- DM II
- Myopia
- Steroids, Trauma

15 **Nuances about Intraocular pressure measurements**
- 15-40% population with POAG may have consistent IOP below 21 mm Hg

=Normal tension glaucoma (esp. Japanese, Koreans)

-2/3 glaucoma patients have peak IOP outside of office hours
- Diurnal variations
- Dependent on central corneal thickness
-

16 **CASE PRESENTATION**
- What are your next treatment steps?
  - 1. YES, I DID START! Start Prostaglandin– Lumigan .01% qhs OU, educate proper use, and potential side effects, and incorporate into daily evening activity.
  - 2. Have patient tell all family members to get checked for glaucoma and also to re-question parents on family history
  - 3. Followup in a month: Recheck IOP at different time of day and ONH, consider repeat HVF.

17 **CASE PRESENTATION**
- What happened to CH?
  - 1. After 3 months Lumigan .01% qhs OU, IOP was about 15 OU. Disc heme resolved.
  - 2. He found out that Mom and sister in Taiwan do have glaucoma.
  - 3. No DM II , HTN .
  - 4. Repeat HVF 24-2 SITA STD scheduled for future visit.

18 **CASE PRESENTATION #2**
- NS is a 56 yo Caucasian male radiologist, on routine exam with a new optic disc hemorrhage OD with IOP of 20 mm Hg.

  IS THIS GLAUCOMA?
-

19 **CASE PRESENTATION**
- Va : 20/25 OD , 20/50 OS myope (-10.5 OU)
- IOP (applanation): 20 OU @ 8am (Tmax= 20)
- Pachy: 515 microns OD and 510 OS
- Gonio: Grade IV, open to CBB
- Slit Lamp: unremarkable, except trace NS cataracts OU (no Krukenberg spindle).
- Mom has Glaucoma– uncertain if had surgery.
- NO steroids/no trauma.
-

20 **Fundus Photos**
1. OD
2. OS

21 **CIRRHUS OCT-RNFL**

22 **HVF 24-2 SITA STANDARD**

1. OD
2. OS

23 **CASE PRESENTATION #2**

- NS is a 56 yo WM, risk factors: high myopia, family history, disc hemorrhage OD.
- Tilted myopic disc—difficult to measure C/D=

??.4 OD, .2 OS?

24 **OPTIC DISC HEMORRHAGE DIFFERENTIAL DIAGNOSIS**

- Glaucoma– usually indicates active disease and possible sign of progression ("Drance hemorrhage"—splinter heme)
  - Drance SM, Fairclough M, Butler DM, Kottler MS. The importance of disc hemorrhage in the prognosis of chronic open angle glaucoma. Arch Ophthalmol 1977;95:226-228
- Diabetes
- Hypertension
- Acute vitreous detachment
- Trauma

- Diurnal variations
- Dependent on central corneal thickness
- Other IOP measurement inaccuracies(LASIK, PKP, tight Asian lids)
- NCT vs. tonopen vs. applanation

25 **CASE PRESENTATION**

TO START OR NOT TO START?

26 **CASE PRESENTATION**

- What are your next treatment steps?
  - 1. NO, I DID not START! (But I think there's nothing wrong with "Starting now" either)
  - 2. I thought he had a PVD OD, associated with disc heme OD.
  - 3. Followup in 2 month: Recheck IOP at different time of day and recheck for recurrent optic disc heme.
  - 4. HVF 24-2 SITA SWAP to detect earlier defects

27 **CASE PRESENTATION**

- What happened to NS?
  - I have now followed NS for 14 years. He has not had a recurrent optic disc heme.
  - His optic nerve cupping has remained stable , with annual fundus photos.
  - His IOP is in range of 17-20, repeat HVF 24-2 SITA SWAP are normal.

- Still has risk of developing glaucoma though, as he ages. (Risk factors: mom, high myopia, thin CCT)

28 **HVF SITA SWAP**

- Swedish Interactive Threshold Algorithm Short-Wavelength Automated Perimetry
- Blue-on-yellow Perimetry (blue lights on yellow background) : isolating blue cones & their associated bistratified retinal ganglion cells.
- Takes about 5-7 minutes /eye
- Can detect VF defect 3-5 years before standard automated (white-on-white) perimetry
- NOT useful in elderly, cataracts, and poor concentration.
- In my practice: I do these on patients who have normal HVF 24-2 SITA Standard.
-

29 **CASE PRESENTATION #3**

- AF is a 57 yo Caucasian female professor referred by her optometrist, with abnormal repeatable visual fields with IOP of 18 mm Hg.

IS THIS GLAUCOMA?

-

30 **CASE PRESENTATION**

- Va : 20/25 OU , hyperope (+1.50 OU)
- IOP (applanation): 18 OD, 17 OS @ 4pm
- Pachy: 520 microns OD and 512 OS
- Gonio: Grade IV, open to CBB
- Slit Lamp: unremarkable, except trace NS OU
- No family history of glaucoma.
- NO steroids/no trauma.
- Decreased vision with night driving.
-

31 **Fundus Photos**

1. OD
2. OS

32 **OCT-RNFL**

1. 12.17.13
2. 1.19.16

33 **HVF 24-2 SITA STANDARD**

1. OD
2. OS

34 **CASE PRESENTATION**

TO START OR NOT TO START?

35 **CASE PRESENTATION**

- What are your next treatment steps?
  - 1. NO, I DID not START!
  - 2. HER optic nerves did not look like glaucoma.

- 3. There are buried ONH drusen OU, which are likely causes of Nasal visual defects OU.
- 4. OCT may be useful for detecting progression?
- 5. HVF 24-2 SITA STD– repeat annually to follow progression of defects
- 6. Not likely to develop glaucoma, but VF defects can progress.

36 **OPTIC NERVE DRUSEN**

- Often incidental findings during routine eye exam—yellow deposits on and around optic nerve
- What are they: deposits of mucopolysaccharides and proteinaceous material that accumulate anterior to the lamina cribosa within the optic nerve head
- Typically seen in crowded optic nerve heads
- Found in approx 1 % general population
- Often bilateral (75-85%)
- More common among Caucasians(?AD pattern of inheritance)
-

37 **OPTIC NERVE DRUSEN**

- 2 main types
  - Visible drusen
  - Buried Drusen (Bumpy/lumpy Optic nerve)
- Optic disc can appear to have no "cup", and can look like papilledema.
- As patients get older into adulthood, drusen can become more visible, and protrude from edge of disc, esp . inferonasal
- Asymptomatic, more commonly.
- Earliest symptoms: peripheral VF defects or transient visual obscurations ("flickering" or "graying out") –8.6% report these obscurations.
- Most common VF defects: enlarged blind spot, inferior nasal VF defects
- May need neuroimaging, if cannot distinguish between real papilledema
-
-

38 **OPTIC NERVE DRUSEN**

- Diagnosis
  - B scan echo: highly reflective
  - Fluoroscein angiography: auto-fluorescent, in late phase-Hyperfluorescent
  - OCT: can show RNFL thinning
  - CT scan : can show calcified drusen
- Complications: (? ON Drusen enlarge →compress /compromise nerve fibers and vascular supply)
  - Risk of Anterior Ischemic Optic Neuropathy
  - Risk of vascular occlusion (ie. CRAO, CRVO)
  - Risk of juxtapapillary choroidal neovascularization, with hemorrhage
- Treatment: serial VF , serial FF, serial OCT, IOP checks, consider IOP lowering?? But there is no definitive treatment.

39

1 **MYOPIC TREATMENT**
PRESBYOPIC PATIENTS

Dan B. Tran, MD
Anterior Segment – Cataract – Cornea – Refractive Surgery Specialist
Medical Director Coastal Vision Medical Group
Lisa D. Garbutt, MD
Anterior Segment – Cataract – Cornea – Refractive Surgery Specialist
March 2016

2 **Acknowledgement**

- My special thanks to Dr. Tim You, Orange County Retina Group, for the slides on retinal pathology

3

4 **MYOPIA & ASTIGMATISM & PRESBYOPIA**

- Correcting Myopia
  - Corneal base surgery
    - LASIK
  - Lens base surgery
    - Lens replacement
- Correcting Presbyopia
  - Corneal base surgery
    - Corneal inlays
    - Presbyopic LASIK & Monovision LASIK
  - Lens base surgery
    - Multifocal IOL
    - Accommodative IOL
    - Monofocal IOL w/ monovision
  - Scleral base surgery
    - VisAbility™ scleral implants (FDA clinical trial)
- Correcting Astigmatism
  - All modalities above <u>except</u> corneal inlays and scleral implants

5 **Current (FDA) Presbyopia Treatment Options**

1 - Non-Surgical Options
  - Corrective eyewear
    - Glasses (reading glasses)
    - Specialty contact lenses

2 - Surgical Options
  - Monovision LASIK / PRK
  - Corneal Inlay KAMRA
  -
  -
  -
  -
  -

- Refractive Lens Exchange / Cataract
-
-
-

6

7

8

9 **Getting to Know Today's Presbyopic Patient**

- Large, rapidly growing demographic (i.e., baby boomers)
- Educated, financially secure
- Increased life expectancy
- Longer working careers
- Are unwilling to compromise active lifestyle
- Embrace demand-driven healthcare
- Demand high quality vision (e.g., reading, distance, night)
- Have new requirements for intermediate vision (e.g., computers)
-

10 **LENS REPLACEMENT SURGERY:**
Presbyopic Patients Candidacy?

11 **How Accurate is IOL Refractive Outcomes?**

- Axial length of the eye
-
- Average Corneal Power and Astigmatism
  - Corneal Astigmatism (for outcomes)
- Effective IOL position prediction
  -
- For advanced formulas
  - White-to-white
  - Lens thickness
  - Anterior chamber depth

12 **Importance of Preop Biometry and Keratometry**

- 43-67% of large refractive surprise due to inaccurate preoperative measurement (axial length or keratometry)[1,2]
- 1mm AL error = approx. 3 D error
  - In a normal axial length eye at 23mm
- 1D K error = 1 D IOL error
- Remove hard contact lens > 2 weeks before measuring corneal power
-

13 **Factors Affecting IOL Predictability[1]**

1 If IOL is 0.5 mm posterior to the assumed plane, a 21 D lens will produce only 20 D of correction

•

•

2 If IOL is 0.5 mm anterior to the assumed plane, a 21 D lens will produce 22 D of correction

•

14 **IOL Choices 2016**

- Monofocal IOL
  - Spherical IOL
  - Aspheric Spherical Aberration Reduction IOL
  - Toric IOL
- Multifocal IOL
  - Alcon ReStor™ Apodized Diffractive Optic
  - AMO Tecnis™ Multifocal Diffractive Optic
- Accomodative IOL
  - Bausch + Lomb Crystalens™ and Trulign™

15 **Toric IOL: AcrySof and AMO Tecnis**

- Single-Piece IOL effectively addresses astigmatism when correctly positioned in the eye
  - superior stability and centration
  - low secondary complication rate
- AcrySof Spherical Power Range - +6 to +30 D

16 **Toric IOL Case**

- Patient E.S.
  - 75 yo M with 3+ NSC OS
- Pre-Op Refraction: -5.75 +2.50 x 176°
- Pre-Op Biometry
  - IOL Master 1.34@176°
  - Pentacam 1.64@173°
  - Galilei 0.95@169°
  - Atlas 1.31@176°
-

17 **Toric IOL Case**

- IOL Placed
  - Alcon SN6AT4 in the bag at 175 to correct 1.5D cyl

18 **Toric IOL Case**

- POM 1
  - UCVA: 20/60
  - Post-Op Refraction: -2.25 +1.00 x 165
  - BCVA 20/20
  -
  - Undercorrection by 1D

19 **Factors to Toric IOL Implantation**

- 1. Measuring the magnitude and axis of astigmatism in the cornea
-
- 2. Finding the correct axis on the patient's cornea intraoperatively
-
- 3. Lining up the IOL accurately in that axis

20 **Stability and Precision**
(1° = 3.3% loss of cylinder power)

21 **Preoperative Keratometry: Why do Measurements Differ?**

- Manual and autokeratometry
  - 4 points, 3-3.2 mm zone
- IOL Master
  - 6 points, 2.5 mm zone
- Lenstar
  - 32 points, 2 zones (1.65mm/2.3mm)
- Topography
  - >500 points, values averaged over central 3-4mm
- Scheimpflug imaging combined with placido disc topography
  - Pentacam, Galilei

22 **Which is method is best?**

- Topography
  - Pros: accurate anterior surface contour
  - Cons
    - No posterior surface information
    - Data dropout in distorted/irregular corneas
-

23

- Tomography
  - Pros
    - Posterior surface information
    - Accurately measures distortions and aberrations
  - Cons
    - Topography map derived from corneal section slices

24 **Which method is best?**

- Color LED topographers
  - Cassini, i-Optics
  - Pros
    - Does not use edge detection
    - Regular or irregular corneas
    - Poor tear film
    - Instantaneous capture
    - Axis accuracy
  - Cons

- No posterior surface information
- Requires further clinical validation studies
-
  -

25 **Which method is best?**

Am J Ophthalmol, 2009

26 **Which method is best?**

Korean J Ophthalmol, 2012

27 **Which method is best?**

- Measurement errors can be dramatically reduced by averaging measurements from manual keratometry with any automated technology

28 **Effect of posterior corneal astigmatism**

- With age, anterior corneal astigmatism trends towards ATR astigmatism
- Posterior corneal astigmatism remains relatively constant
- Effective minus lens → additional ATR
- Corneal astigmatism calculated from anterior corneal surface measurements only
  - WTR group: mean over-correction of 0.5 D
  - ATR group: mean under-correction of 0.3 D
-
-

29 **How accurate are we?**

1. FDA Clinical Trial for Alcon AcrySof IQ Toric IOL available at: http://www.alconsurgical.com/pdfs/TOR240.pdf
2. Potvin, et al. J Refract Surg., 2013.
3. Ahmed II, et al. J Cataract and Refract Surg., 2010.
4. Mendicute, et al. J Cataract and Refract Surg., 2008.

-

30 **Room for Improvement**

- Image overlay intraoperatively
  - Verion System at La Veta Surgery Center in Orange
    - First in Southern California
- Intraoperative aberrometry
  - ORA (WaveTec Vision)
  - Holos (Clarity Medical Systems)
- Even with these devices, we still need a pre-operative IOL plan
  -
  -

31 **MANAGING ASTIGMATISM**

- Don't over look manual keratometry

- Use multiple devices
- Remember posterior corneal astigmatism
- Push for new technologies
  -
  -

32 **ORA System® w/VerifEye™: *Designed to Optimize Every Cataract Procedure***

ORA's all new Optiwave™ technology takes intraoperative wavefront aberrometry to a *new level of precision* providing surgeons a *higher level of confidence*

33 **Keratometric vs. Refractive Cylinder**

- Recent Work Using Devices That Measure Both the Anterior and Posterior Corneal Curvature Shows a Cylinder Contribution From the Posterior Corneal Surface (first recognized by Javal in 1890)
  - ARVO 2011 Presentation by Li Wang, Shazia Ali, Mariko Shirayama, Mitchell Weikert and Douglas Koch
  - J Cataract Refract Surg, 38:2080-2087, 2012

34 **How Well Would Baylor Nomogram Work on This Data Set?!**

35 **The ORA Toric IOL Rotation**

36 **Improved astigmatic outcomes with VerifEye®**

37 **Improved astigmatic outcomes with VerifEye®**

38 **Presbyopia Correcting IOL**

Dan B. Tran, M.D.
COASTAL VISION MEDICAL GROUP
Long Beach – Newport Beach - Orange

39

40 **TRULIGN™ Toric IOL**

Now we have a new member of the Crystalens family that builds on the AO model but adds astigmatic correction.

41 **AcrySof® IQ ReSTOR® IOL**

42 **Allocating Light Energy According to Activity**

43 **Mean Visual Disturbances**
3 Month Data

44

45 **TECNIS® Multifocal Acrylic IOL**
Model ZMA00 Specifications

- Full diffractive posterior surface
  - Pupil-independent

- Designed to reduce chromatic aberration at near
- Wavefront-designed aspheric anterior surface
  - Designed to correct spherical aberration to zero
- Optical power add +4.0D
  - To optimize acuity at preferred reading distance of 33 cm

46 **Full Diffractive Surface = Pupil Independence**

47 **TECNIS® Multifocal Family of IOLs**

48 **TECNIS® Multifocal IOLs +3.25 D and +2.75 D Clinical Outcomes**

49 **TECNIS® Multifocal IOLs +3.25 D and +2.75 D Clinical Outcomes**

50

51 **TECNIS® Multifocal IOL +4.0 D**

52

53 **TECNIS® Multifocal IOL +3.25 D**

54

55 **TECNIS® Multifocal IOL +2.75 D**

56 **TECNIS® Multifocal Family of IOLs Binocular Defocus Curve at 6 Months**

57 **LASIK Retreatment Rate**

58 **The Need for Improvement**

59 **Alcon LenSx Laser**

- Femtosecond Laser
- Integrated OCT
- Universal Curved Patient Interface
-
- First femtosecond laser cleared for an indication in cataract surgery

- FDA approvals
  - Capsulotomy
  - Laser Phacofragmentation
  - Cataract Incisions

- CE mark
  - Capsulotomy
  - Laser Phacofragmentation
  - Cataract Incisions

60 **Laser Refractive Cataract Surgery – LenSx® Laser System Docking and FS Laser Treatment**

61 **Femtosecond Laser Cataract Surgery**

62 **Does Capsulotomy Size Impact ELP?**

Consistent capsulorhexis diameter is critical to Effective Lens Position[1,2]

- A 4 mm capsulorhexis results in longer post-operative ELPo than does a 6 mm capsulorhexis for the type of IOL used [3]
-
- To ensure that an IOL's position in the bag matches the anticipated formula used to calculate its power, the capsulorhexis should be round, centered and smaller than the IOL optic[2]

63 **Comparative IOL Refractive Outcomes with Femtosecond Laser Assisted Refractive Cataract Surgery**

Dan B. Tran, M.D.
Long Beach – Newport Beach - Orange

64 **Accuracy to Target distribution**

65 **Accuracy to Target distribution – Accommodating**

66 **6 Months Postop Aberration Comparison**

67 **Inflammation: A Common Concern**

- Approximately 5 million ophthalmic surgeries are performed annually in US[1]
  - Postoperative inflammation is a common occurrence after these procedures[2]
- Despite surgical advances, most patients will present with some degree of postoperative inflammation.[2,3]
  - Some patients are more susceptible
  - Every patient displays inflammation differently
  - Cannot predict severity
- Under-treatment, delayed treatment, or lack of treatment can lead to:[3]
  - Decreased visual acuity
  - Pain & discomfort
  - Photophobia
  - Corneal edema
  - Cystoid Macular Edema
  - Glaucoma

68 **Recommendations on Approaches for Clinical Practice Adaptation**

- Refractive Surgery Practice
  - More similarity to LASIK practice
  - Patients education and informed consent process are critical
- Patient Selection
  - No ocular co-morbidity
  - Candidacy similar to candidate for multifocal IOL or toric IOL
    - Aggressively treating any peri-operative ocular co-morbidity
      - Dry eyes, blepharitis, residual refractive errors if present
      - Monitor for any evidence of CME closely
- Do NOT make excuses for suboptimal refractive outcomes... FIX IT!
  - LASIK enhancement as needed
-
-

69 **How to discuss these technologies**

1)Assess the patient's medication condition
  a)Ensure no ocular pathology except cataract
  b)
2)Determine patients visual needs
  a)IOL choices to match up with lifestyle needs
    a)Monofocal vs. toric vs. multifocal IOL
    b)Monovision candidate
    c)
3)Discuss surgical approach
  a)Astigmatism Management
  b)Discuss the benefits and risks of femtosecond laser refractive surgery
  c)
4)Discuss intra-operative aberrometry (ORA™)
5)
5)Discuss the need for other methods to hit refractive target
  a) LASIK Treatment at 3 months if needed

70 **PREOPERATIVE EVALUATION**

- DETAILED HISTORY WITH LIFESTYLE ASSESSMENT
- COMPLETE EYE EXAMS INCLUDING EVALUATION
  - DRY EYES AND EXTERNAL DISEASES ASSESSMENT
  - PUPIL SIZE EVALUATION
  - CORNEAL TOPOGRAPHY AND PACHYMETRY
  - OCT OF MACULAR
  - FUNDUS EXAM OF MACULAR AND PERIPHERAL RETINA
    - RETINA CLEARANCE FOR HIGH MYOPES
  - VISUAL FIELD AND OCT NERVE FIBER LAYER ANALYSIS FOR GLAUCOMA PATIENTS
- INFORMED & CONSENT PROCESS DISCUSSING EXPECTATIONS, RISKS AND BENEFITS, POTENTIAL FOR ENHANCEMENT SURGERY
- PROPHYLACTIC USE OF TOPICAL ANTIBIOTICS, NSAIDS
  - DRY EYE AND BLEPHARITIS TREATMENT AS NEEDED

71 **POSTOPERATIVE MANAGEMENT**

- VISUAL ACUITY AND MANIFEST REFRACTION
- DRY EYE AND BLEPHARITIS ASSESSMENT
- CORNEAL STATUS ASSESSMENT
- IOP MONITORING WHILE ON STEROIDS DROPS
- CYSTOID MACULAR EDEMA MONITORING WITH OCT
- VISUAL SYMPTOMS DISCUSSION AND REASSURING
- DISCUSS ANY SPECTACLES NEEDS
- DISCUSS TIMING AND NEEDS FOR SECOND EYE SURGERY
- TRANSFER OF CARE PROCESS
- POSTOPERATIVE MEDICATIONS INCLUDING ANTIBIOTIC , STEROIDS, NSAID, IOP LOWERING MEDS MOSTLY TOPICAL
-

72 **CORNEAL BASE**
REFRACTIVE SURGERY

73 **MONOVISION LASIK:**
WaveLight Refractive Suite

74

75

76

77

78

ReLEx-Smile preserves corneal biomechanics
– Anterior and central stromal lamellae are stronger*1
– Vertical cuts weakening the cornea strain much more than horizontal cuts*2
Goal: preserve most of the anterior stroma, minimize vertical cuts/sidecuts (length & depth)

Advantage of ReLEx-Smile vs F-Lasik:
➢ Intact anterior stromal lamellae and no anterior corneal sidecut
➢ 50-70µ of the anterior stroma additionally contribute to corneal tensile strength
--> Better corneal biomechanical stability

→
→
→
→

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79

80

– Cornal nerve bundles grow in anterior stroma from periphery towards central corneal

– Nerves are penetrating Bowman´s layer and spreading as a subbasal nerve plexus, branching vertically and horizontally

•

with LASIK flap preparation nerve bundles are cut and severed by laser ablation

•

•

◉

◉

81 **Dry Eye Study**

82 **Introduction to the KAMRA® Inlay**

83 **Inlay Design**

84 **The KAMRA® Inlay Indications for Use**

The KAMRA® inlay is indicated for intrastromal corneal implantation to improve near vision by extending the depth of focus in the non-dominant eye of phakic, presbyopic patients between the ages of 45 and 60 years old who have cycloplegic refractive spherical equivalent of +0.50 D to -0.75 D with less than or equal to 0.75 D of refractive cylinder, who do not require glasses or contact lenses for clear distance vision, and who require near correction of +1.00 D to +2.50 D of reading add.

•

85 **Corneal Physiologic Principles**

- Oxygen enters from the tears
- Glucose & other metabolites enter from the aqueous humor
- Catabolites exit to the aqueous humor

86 **Depth of Focus *without* Correction**

87 **Depth of Focus *with* the Inlay**

Depth of focus and image quality of a KAMRA® inlay eye of a 49 Year Old Presbyope

88 **Inlay Placement Guidance**

- The AcuTarget HD™ instrument provides pre-op and post-op centration information:
  - Identifies unique optical landmarks to assist with inlay centration planning
  - Confirms achieved inlay placement
  - Assists with managing vision complaints post-operatively
  - Advanced features:
    - Pre-op result also identifies purkinje vs pupil by location (i.e. inferior temporal)
    - Pre-op print out includes additional ocular landmark graphics, patient demographic, time and date information
-

89 **Tear Film Assessment**

- Dry eye can have a significant effect on patient quality of vision and satisfaction post-op
- The AcuTarget HD™ instrument provides additional objective measurement of your patients:
  - *Tear evaporation rate*
  - *Associated degradation in quality of vision from tear evaporation over time*
- This information can be used to:
  - *Improve patient selection*
  - *Minimize the influence of dry eye on outcomes*
  - *Inform on patient adherence to dry eye regimen*
  -

90 **How the KAMRA® Inlay Works**

- The small aperture allows only focused light rays to enter the eye, which:
  - Reduces blur when viewing near objects
  - Increases depth of focus
  - Minimally affects distance vision

91

92 **Results**

93 **Uncorrected Near Visual Acuity:**
Inlay Eye – Data from US IDE

- On average patients experienced a gain of 3.4 lines of near acuity between pre-op and the 36 month follow-up visit

94 **Uncorrected Intermediate Visual Acuity: *Inlay Eye***

95 **Uncorrected Distance Visual Acuity:**
Inlay Eye

- Monocular uncorrected distance acuity in the inlay eye remained unchanged at 20/20

96 **UCNVA at 5 Years**

- UCNVA improved from a mean of J8 to J2 in the inlay eye (IE) between pre-op and 1 month and is maintained out to 5+ years
- Vision in the inlay eye and with both eyes (BE) is unaffected by the progression of presbyopia
- UCNVA in the untreated other eye (OE) shows an mean loss of 1 line over the same time period
-

97 **Contrast Sensitivity: *Photopic - Binocular***

98 **Contrast Sensitivity: *Mesopic - Binocular***

99

100 **Task Performance**

101 **Summary of Results**

- Near vision of J2 achieved on average
- Distance vision is minimally affected
- Long-term data shows maintained visual gain
- Results show that binocular mesopic contrast sensitivity remains within normal limits at 24 months post-op.
- There was no statistically significant change to depth perception as compared with pre-op results in the study done by Dr. Hoopes
-
-
-

102

103 **Proposed Mechanism of Action for Treating Presbyopia with VisAbility**

104 **The VisAbility U.S. Clinical Trial (FDA)**

- Now enrolling: Multi-Center 2 year study to generate data for a U.S. submission and possible approval
- Safety is paramount and the foremost priority of the study
- Investigating significant improvements in instrumentation and technique
- Early access to the newest technology
  - Longstanding history
  - Developed by Refocus Group, Inc. (founded in 1996)
  - CE Marked in the E.U.
  - Procedure provided at no cost
- Open to only 360 patients
  - Limited to 28 patients are each site
  - Available (in the U.S.) for a limited time

105 **Multi-Center Clinical Study**

106 **What are VisAbility Implants?**

- Tiny clear implants made of PMMA polymer

- Sterile, single-use, and biologically inert
- Same material that has been implanted in other surgical procedures for over 50 years

107 **What happens during the VisAbility Procedure**

- Numbing drops and antianxiety medications given to keep you comfortable and relaxed
-
- 4 (four) VisAbility Implants are placed just below the surface of the white of the eye through tiny incisions
-
- The outpatient procedure is minimally invasive and typically takes 15-20 minutes per eye.
-
- OR staff will observe patients immediately after surgery for any potential complications
-

108 **What to expect after the VisAbility Procedure**

- Improvement in near vision
- Slight irritation that usually goes away in a few days
- Temporary redness that goes away after a 3-4 week healing period
-
-
-
-
-
  - After healing period patients should feel confident to pursue any normal activities

109 **How long does it take for near vision to improve?**

- Rehabilitation Period: Patients may experience gradual improvement within the 1st month (with continuous improvement 3 months and beyond)
-
- Start engaging in "near activities" to strengthen the focusing muscles
  - Allow more time to read
  - Do not wear reading glasses
  - Be patient
  -
- Near vision continues to improve over time

110 **Percentage of subjects with near acuity 20/40 better and 2 lines improvement (after surgery)**

111 **Patient Satisfaction:**
Significant Improvement in Near Vision

112 **SEE YOUNG AGAIN**

- May improve near vision
  - *May eliminate or reduce your need for reading glasses due to presbyopia*
- May provide a full range of focus
  - No loss of distance or intermediate vision

- Works outside of the visual axis
  - *Maintains integrity of the cornea and lens*
- Allows for flexibility
  - *Implants do not interfere with other procedures (e.g., cataract surgery) and are removable*
- Natural binocular solution
  - Not a monovision, bifocal or multifocal solution
  -

113 **CLINICAL PHOTOS**

114

115

116 **Retinal Detachment**

117

Retinal Detachment

- Annual incidence 1:10,000-15,000
- OC 300-400
- Prevalence 45 in 15,000
- Risk Factors: Myopia >6dptr, Aphakia, Trauma, Vitreous Loss, Family Hx, Syndromes
- Risk for Fellow Eye is up to 15%
- Symptomatic PVD 6-12% Risk
- Vitreous Hemorrhage 70% Risk

118

Retinal Care of the Myopic Patient

- Ruiz-Moreno (2003)
- N= 9,253 patients
- RD risk 1:10,000 (<0.0001%) general pop
- RD risk 0.15% after PRK
- RD risk 0.36% after LASIK
- RD risk 4.08% after IOL
- RD risk 8.10% after IOL for pt > -10dptr
  - Colin (2008)

119 **Retinal Detachment**

120 **Treated Retinal Tear**

121 **Lacquer Cracks**

122 **Macular Hole**

Macular Pucker

Vitreomacular Traction

123 **Clinical Pearls**

- Symptomatic PVD w/o breaks – see patient within one month or refer
- Symptomatic PVD w/ break – refer within 48 hours
- Symptomatic PVD w/ heme – see patient within 1-2 weeks or refer –high risk for RD
-

124 **Clinical Pearls**

- Loss of central vision (inability to refract better than baseline) - refer
- Metamorphopsia – get OCT and look

for CNVM or atrophy

- Patient with Multiple Questions – refer or decline elective surgery
-

125 **CYSTOID MACULAR EDEMA**

126 **HYPOPYON**

127 **Macular Lesions**

128 **Macular Lesions**

129 **MACULAR LESIONS**
VISUAL FIELD CHANGES

130

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Dan B. Tran, MD

Medical Director
Cornea, LASIK & Cataract Surgery Specialist

With the mind of a trained engineer and the intuitive skills of an experienced surgeon, Dr. Dan B. Tran is internationally recognized as a leading expert in advanced vision correction.

The all-laser, bladeless LASIK technique, now considered the standard in care, was first introduced by Dr. Tran to LASIK centers in Orange County when it received FDA clearance in 2001. Dr. Tran is also the first surgeon in the world to combine IntraLaseTMfemtosecond laser technology with intracorneal rings (Intacs™) to treat keratoconus, a vision loss disorder affecting young adults.

In 2011, Dr. Tran was the first surgeon in California to utilize advanced LenSx™ femtosecond technology to perform refractive cataract surgery. This technology is now used in hundreds of cataract centers around the world by highly prominent cataract surgeons. He is among a select few surgeons currently conducting multiple FDA clinical studies on new advanced ophthalmic surgical implant devices.

His combination of surgical finesse and deep understanding of technology are why eye doctors and eye industry executives alike trust Dr. Tran as their personal surgeon. These traits have helped propel the advancement of surgical eye care in Orange County, keeping it at the forefront of surgical eye care delivery worldwide.

Featured several times in the Orange County Register, a member of medical advisory boards for several medical device companies, often invited to conduct FDA clinical trials, and published many times in national ophthalmological publications, Dr. Dan B. Tran is a frequent speaker at national and international meetings throughout the world.

EDUCATION

1984 BS, Electrical Engineering, Magna Cum Laude, California State Polytechnic University, Pomona, CA

1985 Graduate Studies in Electrical & Biomedical Engineering, Stanford University, Palo Alto, CA

1987 Graduate Studies in Electrical & Biomedical Engineering, University of Arizona, Tucson, AZ

1993 MD, University of Southern California, Keck School of Medicine, Los Angeles, CA

PROFESSIONAL TRAINING

1994 Internship, Internal Medicine, St. Mary Medical Center, UCLA School of Medicine, Los Angeles, CA

1997 Resident in Ophthalmology, Scheie Eye Institute, University of Pennsylvania, Philadelphia, PA

FELLOWSHIPS

1998 Fellow in Cornea and Refractive Surgery, Shiley Eye Center, University of California, San Diego, CA

BOARD CERTIFICATION

1999 American Academy of Ophthalmology

PROFESSIONAL AFFILIATIONS

- American Society of Cataract & Refractive Surgery
- International Society of Refractive Surgery
- American Academy of Ophthalmology

UNIVERSITY & HOSPITAL POSITIONS

- Clinical Instructor, Shiley Eye Center, University of California, San Diego, CA
- Staff Ophthalmologist, St. Joseph Hospital of Orange, CA
- Staff Ophthalmologist, St. Mary Hospital, Long Beach, CA

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Betsy Nguyen, MD

Glaucoma & Cataract Specialist

Dr. Betsy Nguyen is a board certified cataract & glaucoma specialist, with 14 years of experience in her field. Trained at the prestigious, internationally recognized Jules Stein Eye Institute, at UCLA, Dr. Nguyen then became active in glaucoma research with the USC Doheny Eye Institute.

After earning her medical degree with highest distinction at the top of her class from UCLA School of Medicine, Dr. Nguyen went on to UCSF for her fellowship in glaucoma. As a diplomate of the American Academy of Ophthalmology and the California Academy of Eye Physicians & Surgeons, she was one of the team eye doctors for both the LA Angels and the Anaheim Ducks.

Dr. Betsy Nguyen is an ardent researcher, to further treatment options available for all, and has extensive expertise in managing glaucoma and cataracts together. These commonly concomitant conditions are best treated together—treating one and ignoring the other will result in long-term problems for patients. Dr. Nguyen uses the most advanced technologies available to combine the treatment in an integrated fashion, offering patients with cataract and glaucoma the very latest in surgery and research.

Customizing care to every one of her patients, Dr. Nguyen remains passionate about what she does and spends quality time counseling each one. "I give every patient the same level of attention and surgical excellence as I would give my own family."

EDUCATION

1991 Bachelor of Science, Biological Sciences, University of California, Irvine, CA

1995 Doctor of Medicine, David Geffen School of Medicine, University of California, Los Angeles, CA

PROFESSIONAL TRAINING

1995-1996 Internship, Preliminary Medicine, University of California, San Fernando Valley, CA

1996-1999 Residency, Ophthalmology, Jules Stein Eye Institute, University of California, Los Angeles, CA

FELLOWSHIPS

1999-2000 Clinical Fellowship, Glaucoma and Clinical Instructor; University of California, San Francisco, CA and California Pacific Medical Center

BOARD CERTIFICATION

1997 Medical Board of California

2000 American Academy of Ophthalmology

PROFESSIONAL AFFILIATIONS

American Academy of Ophthalmology

American Society of Cataract and Refractive Surgery

American Medical Association

California Medical Association

California Academy of Eye Physicians & Surgeons

Memorial Physician Society

Orange County Ophthalmology Society

Orange County Glaucoma Society

RESEARCH, EXPERIENCE, PRESENTATIONS & PUBLICATIONS

2013 Researcher for USC – Collaboration with Chinese American Eye Study (CHES). Collaborate with Rohit Varma, MD.

2012 Baseline risk factors that predict the development of open-angle glaucoma in a population: The Los Angeles Latino Eye Study. Ophthalmology. 2012 Nov;19(11):2245-53.

2012 Four-year incidence of open-angle glaucoma and ocular hypertension: The Los Angeles Latino Eye Study. Am J Ophthalmol. 2012 Aug;154(2):315-325.

2011 "Population and High Risk Group Screening for Glaucoma: The Los Angeles Latino Eye Study", Invest Ophthalmol Vis Sci. 2011 August; 52(9): 6257–6264.

2000-2011 Researcher for USC – Collaboration with Los Angeles Latino Eye Study (LALES). Collaborate with Rohit Varma, MD and Brian Francis, MD.

2005 Screening for Glaucomatous Optic Nerve Damage: The Los Angeles Latino Eye Study. ARVO Abstract. Invest Ophthalmol Vis Sci 2005;46: E-Abstract 2499.

2004 "Prevalence of open-angle glaucoma and ocular hypertension in Latinos: the Los Angeles Latino Eye Study," Ophthalmology, 2004 Aug; 111(8):1439-48.

2003 Prevalence of Open-Angle Glaucoma and Ocular Hypertension in Latinos. The Los Angeles Latino Eye Study (LALES). ARVO Abstract. Invest Ophthalmol Vis Sci 2003;44: E-Abstract 317

2007-2009 Schering study (LOCS III Certified)

2004-2006 TAKEDA study (LOCS III Certified)

2003 Advanced Glaucoma Training DVD, for Allergan

1999-2000 Evaluation of computerized optic discs to determine stability vs. progression of glaucoma, under Robert L. Stamper, MD, Chief of Glaucoma, UCSF.

1998-1999 Retrospective longitudinal study of progression of glaucoma, using multivariate analysis of serial visual fields, stereoscopic disc photographs, and confocal laser imaging, under Joseph Caprioli, MD, Chief of Glaucoma, UCLA Jules Stein Eye Institute.

ARVO paper presentation, "Identification of Glaucoma Progression Through Combined Use of Quantitative Structural and Functional Measures," May 1999.

1995-1997 Development of quantitative methods for evaluation of socket motility of orbital implants, under Robert A. Goldberg, MD, Chief of Oculoplastics, UCLA Jules Stein Eye Institute. Poster presentation, Jules Stein Eye Institute Research and Alumni Day, 1998.

1992-1993 Investigation of traumatic optic neuropathy in a rat model, under Robert A. Goldberg, MD & Kenneth Steinsapir, MD, UCLA School of Medicine. Poster presentation, "Dynamic Changes in Cerebral Glucose Metabolism Following Optic Nerve Trauma," at Neuroscience, 1992.

1989-1991 Investigation of the effects of glycation on the function of the sodium-potassium pump, under Margaret H. Garner, PhD, UCI School of Medicine. Publication, "Na,K-ATPase of Cultured Bovine Lens Epithelial Cells: H202 Effects," Experimental Eye Research, 1992 Mar, 54 (3): 321-7. Poster presentation, "Glucose Control, by Nonenzymatic Glycation of Na, K-ATPase Function in the Nondiabetic," FASEB 1991.

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Lisa D. Garbutt, MD

Comprehensive Ophthalmology
Cornea, Anterior Segment and Eyelid Surgeries

Board certified ophthalmologist Lisa Garbutt, MD, joined Coastal Vision in 2014. As a fellowship trained surgeon, she specializes in cataract surgery, corneal transplants, refractive procedures, such as LASIK, and certain oculoplastic procedures to improve vision such as blepharoplasty and ptosis repair. She is also extensively trained in DSAEK, a breakthrough technique for treating corneal diseases.

In addition to treating medical and surgical diseases of the eye, Dr. Garbutt enjoys being involved in various FDA trials conducted at Coastal Vision. She completed her medical degree cum laude at Boston University School of Medicine and received her ophthalmology training at the University of California, San Diego School of Medicine Shiley Eye Institute. She is a member of the American Academy of Ophthalmology and the American Society of Cataract and Refractive Surgeons.

She also participates in research and FDA clinical trials at Coastal Vision.

"One of the main reasons I became an ophthalmologist is because it gives me the opportunity to make a significant difference in someone's life. We often take our sight for granted, and don't realize how important it is to our everyday functioning, enjoyment, and happiness until it is compromised."

"I enjoy introducing the science and innovation of ophthalmology into my patients' lives. The advancements in this field are moving swiftly forward each year, and allow me to provide the best care possible. Most importantly, I have the utmost respect for the trust of a patient, and aim to use my training, experience, and skill to enhance their quality of life."

Dr. Garbutt is well respected and well liked by her patients, as well as her peers, for her compassion with patient care, her meticulous surgical skills and her comprehensive approach to ophthalmology. She has successfully performed thousands of cataract and cornea surgical cases prior to joining Coastal Vision.

Happy to return home to Orange County, where she grew up, Dr. Garbutt enjoys running, skiing and spending time with her friends and family.

EDUCATION

1994 Bachelor of Science, Psychobiology, University of California, Los Angeles, CA

1999 Master of Arts, Medical Science, Boston University School of Medicine, Boston, MA

2003 Doctor of Medicine, Boston University School of Medicine, Boston, MA

PROFESSIONAL TRAINING

2004-2007 Ophthalmology Residency, Shiley Eye Center, University of California, San Diego, CA

2003-2004 General Surgery Internship, Department of General Surgery, University of California, San Diego, CA

FELLOWSHIPS

2008 Fellow in Cornea, Cataract, and Refractive Surgery, Shiley Eye Center, University of California, San Diego, CA

BOARD CERTIFICATION

2008 American Academy of Ophthalmology

PROFESSIONAL AFFILIATIONS

- American Academy of Ophthalmology
- American Society of Cataract and Refractive Surgery

CURRICULUM VITAE

Eugene Chang, M.D., M.B.A.

Mailing/Contact Address:
Orange County Retina Medical Group
1200 North Tustin Avenue, Suite 140
Santa Ana, California 92705
714-972-8432

PROFESSIONAL PRACTICE AFFILIATIONS

Orange County Retina Medical Group
Physician/Surgeon
Since December 2013

Locations

1200 North Tustin Avenue	Suite 140	Santa Ana, CA 92705	714-972-8432
1200 North Tustin Avenue	Suite 100	Santa Ana, CA 92705	714-972-8432
24022 Calle de la Plata	Suite 475	Laguna Hills, CA 92653	949-581-3618
320 Superior Avenue	Suite 160	Newport Beach, CA 92663	949-646-3242
333 W. Bastanchury Road	Suite 200	Fullerton, CA 92835	714-451-0801
31451 Rancho Viejo Road	Suite 101	San Juan Capistrano, CA 92675	949-496-0611

EDUCATION AND TRAINING

Vitreo-Retinal Fellowship
Rush University Medical Center/Illinois Retina Associates
Chicago, Illinois; 2004-2006

Residency, Ophthalmology
California Pacific Medical Center
San Francisco, California; 2001-2004

Residency, Internal Medicine (preliminary)
University of California, San Francisco, School of Medicine/Fresno-Central San Joaquin Valley Medical Education Program
Fresno, California; 2000-2001

Medical School/Graduate
Medical Doctorate/Master of Business Administration
Tufts University School of Medicine/Tufts University
Boston, Massachusetts; 1996 - 2000

Undergraduate
Bachelor of Arts in Political Science
Brown University
Providence, Rhode Island; 1992-1996

BOARD CERTIFICATION

American Board of Ophthalmology

MEDICAL LICENSURE

Illinois, issued 2004
California, issued 2002

HONORS

1994 Recipient of The Brown University Undergraduate Teaching & Research Assistantship

PROFESSIONAL MEMBERSHIPS

American Academy of Ophthalmology
American Society of Retinal Specialists

PROFESSIONAL/WORK EXPERIENCE

2006 – 2013 Vitreoretinal Surgeon
Kaiser Permanente, Oakland, California

1996 - 1998 Medical Education Review Committee Representative

1995 - 1996 Teaching Assistant
Department of Biology, Brown University, Providence, Rhode Island

Summer 1997 Intern
Dyax Corporation, Cambridge, Massachusetts

Summer 1995 Research Fellow
Center for International and Security Studies, Taiwan Institute of Economic Research, Taipei, Taiwan

RESEARCH

01. Clinical Research in Glaucoma, 1999 - 2000
    Joes S. Schuman, M.D, Department of Ophthalmology, New England Eye Center, Boston, Massachusetts
    - Researched the relationship between glaucoma status and macular thickness as measured with Optical Coherence Tomography

02. Research Assistant, 1994 – 1995
    Robert F. Valentini, Ph.D., Brown University, Department of Orthopaedics, Providence, Rhode Island
    - Assayed drug delivery system in rat and human cell lines
    - Devised experiments to quantify the amount of drugs released into target cells

03. Research Assistant, 1994 – 1995
    Hugh S. Keeping, Ph.D., Brown University, Department of Orthopaedics, Providence, Rhode Island
    - Managed research projects with grant awarded by Brown University
    - Studied the role of bone morphogenetic proteins in the pathogenesis of tumors metastases to bone.
    - Developed quantitative approaches to determine cytokine interactions during prostate cancer progression.

BIBLIOGRAPHY

01. **Chang E**, Chow DR, Packo KH, Olivier S. *Our experience with 25-gauge vitrectomy; its efficacy, efficiency and a look at procedure-based outcomes.* American Society of Retina Specialists, 23rd Annual Meeting, Montreal, Canada; 2005

02. **Chang E**, Luckie A, Ai E, Ahmed I. *Ophthalmic Manifestation of HIV* chapter in HIV InSite Knowledge Base. UCSF; 2005

03. **Chang E**. Wi-Fi 101, *Techniques in Ophthalmology*, December 2004, 171-172.

04. **Change E**. Flat Panel Display Technologies, *Techniques in Ophthalmology*, June 2005, 106-08.

05. Keeping HS, Chang G, Angert L, **Chang E**, Ehrlich MG, Glantz L, Narayan P, Dahiya R. *Interleukin modulation of prostatic bone morphogenetic protein expression in primary tumors and bone metastases.* 41st Annual Meeting, Orthopaedic Research Society.

06. Keeping, HS, Chang G, Angert L, **Chang E**. Ehrlich MG, Glantz L. *Interleukin modulation of prostatic bone morphogenetic protein expression in primary tumor and bone metastases.* 2nd Annual Rhode Island Hospital/Women and Infants Hospital Research Poster Day.

PRESENTATIONS/LECTURES

01. *Good visual acuity following proliferative vitreoretinopathy*. Barkan Society Meeting, San Francisco, California; 2003

02. *Our experience with 25-gauge vitrectomy: its efficacy, efficiency, and a look at procedure-based outcomes*. American Society of Retina Specialists' 23rd Annual Meeting, Montreal, Canada; 2005

03. *Fluorescein Angiography, Indocyanine Green Angiography and Optical Coherence Testing*. 14th Annual Rush Medical College of Ophthalmology Clinical Review Course; 2005

04. *Diagnostic Testing*. Retina Care Symposium, Costa Mesa, California; December 5, 2013

LANGUAGES

Mandarin

CURRICULUM VITAE

TIMOTHY T. YOU, M.D.

Fellow, American Academy of Ophthalmology

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333 W. Bastanchury Road	Suite 200	Fullerton, CA 92835	714-451-0801
31451 Rancho Viejo Road	Suite 101	San Juan Capistrano, CA 92675	949-496-0611

7/2002-2/2005 Rhode Island Eye Institute, Providence, Rhode Island
7/1999-6/2002 Pacific Clear Vision Institute, Eugene, Oregon

EDUCATION AND TRAINING

Vitreo-Retinal Fellowship
Massachusetts Eye and Ear Infirmary
Harvard Medical School, Boston, Massachusetts, 1997-1999
- Thomas Heed Ophthalmic Fellow, 1997-98
- American Ophthalmological Society, Herman Knapp Fellow,1998-99

Research Fellowships
Penn Medical Scholars Anatomic Pathology Fellowship
Department of Pathology & Laboratory Medicine
Hospital of the University of Pennsylvania, 1991-1992

Children's Hospital of Los Angeles
University of Southern California, Doheny Eye Institute
Medical Student Fellowship in Pediatric Ophthalmology, 1989

Residency in Ophthalmology
Massachusetts Eye and Ear Infirmary
Harvard Medical School, Boston, Massachusetts, 1994-1997

Internship in Medicine
VA Medical Center, Sepulveda, California
University of California, Los Angeles, 1993-1994

Medical School
Medical Doctorate
University of Pennsylvania School of Medicine
University of Pennsylvania, Philadelphia, Pennsylvania, 1988-1993

Undergraduate Education
Bachelor of Science in Biology with distinction in major & *cum laude*
Yale College, New Haven, Connecticut, 1984-1988

Lab Assistant, Yale School of Medicine, Department of Microbiology, 1987

PROFESSIONAL POSITIONS

2013-Present	Clinical Rotation Preceptor, Southern California College of Ophthalmology, Fullerton, California
2012-Present	Preceptor and Site Coordinator, Western University Health Sciences, Pomona, California
2012-Present	Chief, Department of Ophthalmology, Children's Hospital of Orange County, Orange, California
2009-Present	Advisor, Clinical Institute , St. Joseph Hospital, Orange, California
2010-2012	Member, Planning Committee, Children's Hospital of Orange County Tower, Orange, California
2006-Present	Expert Witness, Medical Board of California
2005-Present	Medical Reviewer, MES Group
2003-2005	Assistant Clinical Professor in Ophthalmology, Brown Medical School, Providence, Rhode Island
2000-Present	Medical Reviewer, Advanced Medical Group
1997-1999	Assistant Staff, Massachusetts Eye and Ear Infirmary, Harvard Medical School, Boston, Massachusetts

MEDICAL LICENSES

American Board of Ophthalmology, Diplomate, (Board Certified) in 1999
Exam score 95th percentile

American Board of Ophthalmology, Diplomate, (Recertification) in 2009
Maintanence of Certification

Diplomat National Board of Medical Examiners, since 1994

Medical Board of California, since 1993

HOSPITAL AFFILIATIONS

3/1/2005 – Present	Anaheim Regional Medical Center, Anaheim, California
3/1/2005 – Present	Children's Hospital at Mission, Mission Viejo, California
3/1/2005 – Present	Children's Hospital of Orange County, Orange, California
3/1/2005 – Present	Hoag Memorial Hospital Presbyterian, Newport Beach, California
3/1/2005 – Present	St. Joseph Hospital, Orange, California
3/1/2005 – Present	Western Medical Center, Anaheim, California
3/1/2005 – Present	Western Medical Center, Santa Ana, California

HONORS AND AWARDS

2003	Brown Medical School Award for Excellence in Teaching
1999	Fellow of the Year for Massachusetts Eye and Ear for Excellence in Teaching
1999	Fellow Award at Paul Chandler Lecture for Resident Teaching
1997	STORZ Ophthalmic Instrument Design Contest for Modified Phaco-Chopper
1994-1991	Bill Raskob Foundation Award
1993	History of Medicine Prize, *The Stigma of Atomic Bomb Disease*
1992	History of Medicine Prize, *A Short History of Egyptian Military Ophthalmia*
1989	Whanki Essay Contest, *The Perfect Painting*, second place
1988	Summer Research Internship, Taejon Research Institute, South Korea
1985	Jostens' Scholarship
1985	Elks Club Western-Division Scholarship
1985	Soroptomist Club Scholarship
1985	Orange County Medical Association Scholarship
1984-1988	Mission Community Hospital Auxiliary Scholarship
1982-1984	American Academy of Sciences Junior Scientist, University of Southern California/University of California at Irvine

PROFESSIONAL SOCIETY MEMBERSHIPS

American Academy of Ophthalmology, Fellow
American Society of Retina Specialists (The Vitreous Society)
Association for Research in Vision and Ophthalmology
California Association of Eye Physicians and Surgeons
California Medical Association
California Scholarship Federation
Orange County Society of Ophthalmology
Orange County Medical Association
Oregon Medical Association
Society of Heed Fellows
Society of Penn Medical Scholars
Western Retina Study Club

CLINICAL RESEARCH

01. Genetech, Inc., Protocol #FVF2598g (Marina), Phase IIIb, 2003-2005
Sub-Investigator. *A multicenter, randomized, double masked, sham injection-controlled study of the safety and efficacy of rhuFab V2 in subjects with neovascular AMD who have minimally classic or occult lesion*

02. Eyetech Pharmaceuticals, Protocol #EOP1004, Phase II/III, 2005-2005
Sub-Investigator. *A randomized, double-masked, controlled, dose-ranging, multi-center comparative trial, in parallel groups, to establish safety and efficacy of intravitreal injections of EYE001 (anti-VEGF pegylated aptamer) in patients with exudative AMD*

03. Alcon Research, Ltd., Protocol C-01-99, Phase III, 2005-2005
Sub-Investigator. *A multicenter, double-masked, randomized, parallel groups study to demonstrate efficacy and safety of anecortave treatment relative to Visudyne for AMD.*

04. OxiGENE, Inc., Protocol MMD-213, Phase III, 2005-2006
Sub-Investigator. *A multi-center, randomized, double-masked, placebo-controlled, parallel group, evaluation of the safety and efficacy of combretastatin A4 phosphate infusion for treating subfoveal CNV in pathologic myopia.*

05. Diabetic Retinopathy Clinical Research Network(DRCR)/National Eye Institute, Protocol B, 2005-2009
Sub-Investigator. *A randomized trial comparing intravitreal corticosteroids and laser photocoagulation for DME.*

06. Alcon Research, Ltd., Protocol C-02-60 (AART), Phase III, 2005-2009
Sub-Investigator. *Anecortave Acetate Risk Reduction Trial (AART): An evaluation of efficacy and safety of posterior juxtascleral administrations of anecortave acetate for depot suspension (15 mg or 30 mg) versus sham administration in patients (enrolled in study "A" or study "B") at risk for developing sight-threatening CNV due to exudative AMD.*

07. National Eye Institute, SCORE, 2005-2009
Sub-Investigator. *The Standard Care vs. Corticosteroid for Retinal Vein Occlusion (SCORE): Two randomized trials to compare the efficacy and safety of intravitreal injection(s) of triamcinolone acetonide with standard care to treat macular edema: one for CRVO and one for BRVO.*

08. Lilly ICOS LLC, Protocol H6D-MC-LVGO, Phase IV, Collaborative Study, 2005-2006
Sub-Investigator. *A randomized, double-blind, parallel-design, placebo-controlled study to evaluate the effects of 5mg tadalafil (IC351, LY450190) and 50mg sildenafil administered once daily for 6 months on visual function in healthy subjects or subjects with mild erectile dysfunction.*

09. Alcon Research, Ltd., Protocol C0459 (IDEAA), Phase III, 2005-2007
Sub-Investigator. *A trial using anecortave acetate 15mg administered every 3 months versus anecortave acetate 15 mg every 6 months versus anecortave acetate 30 mg administered every 6 with exudative AMD.*

10. Eyetech Pharmaceuticals, Protocol EOP1012, Phase IV, 2005-2007
Sub-Investigator. *A randomized, active-controlled, double-masked, single dummy, multicenter comparative trial, in parallel groups, to compare the safety and efficacy of intravitreous injections of Macugen given every 6 weeks for up to 102 weeks, plus sham PDT, to Macugen plus PDT with Visudyne, in subjects with predominantly classic subfoveal CNV secondary to AMD.*

11. Novartis, Protocol CBPD952E2202 (Veritas), Phase IIIB, 2005-2007
Principal Investigator. *A 24-month randomized, double-masked, sham controlled, multicenter study comparing PDT with verteporfin (Visudyne) plus two different dose regimens of intravitreal triamcinolone acetonide (1 mg and 4 mg) versus Visudyne plus intravitreal pegaptnanib (Macugen) in patients with subfoveal CNV secondary to AMD.*

12. (OSI) Eyetech, Protocol EOP1023 (LEVEL), Phase IV, 2006-2008
Principal Investigator. *An open label, multicenter trial of maintenance intravitreous injections of Macugen (pegaptanib sodium) given every six weeks for 48 weeks in subjects with subfoveal neovascular AMD initially treated with a different modality resulting in maculopathy improvement.*

13. Novartis, Protocol #CBPD952A2308 (Denali), Phase IIIB, 2006-2010
Principal Investigator. *A 24-month randomized, double-masked, controlled, multicenter study assessing safety and efficacy of verteporfin (Visudyne) photodynamic therapy administered in conjunction with ranibizimub (Lucentis) versus ranibizumub (Lucentis) monotherapy in patients with subfoveal CNV secondary to AMD.*

14. Alimera Sciences, Protocol C-01-05-001 (FAME), Phase III, 2006-2011
Sub-Investigator. *Fluocinolone Acetonide in Diabetic Macular Edema (FAME): A randomized, double-masked, parallel group, multicenter, dose-finding comparison of the safety and efficacy of ASI-001A 0.5ug/day and ASI-001B 0.2 ug/day fluocinolone acetonide intravitreal inserts to sham injection in subjects with DME (Medidur®).*

15. Regeneron, Protocol VGFT-OD-0605 (VIEW 1), Phase III, 2006-2011
Sub-Investigator. *CLinical Evaluation of Anti-angiogenesis in the Retina - Intravitreal Trial 3 (CLEAR-IT 3): A randomized, double-masked, active-controlled phase III study of the efficacy, safety, and tolerability of repeated doses of intravitreal VEGF Trap in subjects with neovascular AMD.*

16. Opko, Protocol ACU-301 (COBALT), Phase III, 2007-2009
Sub-Investigator. *COmbining Bevasirinib and Lucentis Therapy (COBALT): A randomized, double-masked, parallel-assignment study of intravitreal bevasirinib sodium, administered every 8 to 12 weeks as maintenance therapy following three injections of Lucentis compared with Lucentis monotherapy every 4 weeks in patients with exudative AMD.*

17. Allergan, Protocol 206207-012, Phase III, 2007-2010
Sub-Investigator. *A 52-week, masked, multicenter, randomized, controlled trial (with up to 13 weeks additional follow-up) to assess the safety and efficacy of 700 ug dexamethasone posterior-segment drug delivery system (DEX PS DDS) Applicator System in combination with laser photocoagulation compared with laser photocoagulation alone in the treatment of subjects with diffuse DME.*

18. Vitreoretinal Technologies, Inc., Protocol PVD-301, Phase III, 2007-2010
Sub-Investigator. *A safety and efficacy study of Vitreosolve for ophthalmic intravitreal injection for inducing posterior vitreous detachment in subjects with NPDR.*

19. Merck & Co., Protocol 007-01 , Collaborative Study, 2008-2009
Ophthalmology Investigator. *A safety follow-up study of patients previously exposed to MK-0634 (a beta-3 receptor antagonist developed for the treatment of overactive bladder). Subjects had previously been enrolled in a multicenter, double-blind, randomized, placebo-controlled, parallel group, dose-ranging study of L-000796568 in postmenopausal women with OAB.*

20. Allergan, Protocol 206207-019-00, Phase II , 2008-2010
Sub-Investigator. *A 26-week, open-label study to assess the safety and efficacy of 700 ug dexamethasone posterior segment drug delivery system applicator system in conjunction with Lucentis® in the treatment of patients CNV secondary to AMD.*

21. Ophthotech Corp., Protocol OPH3000, Phase I, 2008-2010
Sub-Investigator. *An ascending dose and parallel group trial to establish the safety, tolerability and pharmacokinetic profile of multiple intravitreous injections of volociximab ($\alpha 5\beta 1$ integrin antagonist) as monotherapy or in combination with Lucentis 0.5 mg/eye in subjects with neovascular AMD.*

22. Regeneron, Protocol VGFT-OD-0706 (Da Vinci), Phase III, 2008-2011
Sub-Investigator. *A double-masked, randomized, controlled study of the safety, tolerability and biological effect of repeated intravitreal administration of VEGF Trap-eye in patients with DME.*

23. NEI/Tufts Medical Center, The Family Study of Macular Degeneration, 2009-2010
The goal is to evaluate genetic and non-genetic risk factors for AMD

24. Allergan, Protocol 206207-018-00, Phase II, 2008 - 2010
Sub-Investigator. *A 26-week, open-label study to assess the safety and efficacy of 700 ug dexamethasone posterior segment drug delivery system applicator system in the treatment of vitrectomized subjects with DME.*

25. Grunenthal, Protocol KF0151Y/10, Phase IIb, Collaborative Study, 2009-2011
Sub-Investigator. *A randomized, multicenter, double-blind, parallel-group trial to assess the analgesic efficacy and safety of a new analgesic compared with placebo in subjects with painful diabetic peripheral neuropathy.*

26. Endo Pharmaceuticals, Protocol EN3324-201, Phase IIb, Collaborative Study, 2010-2011
Sub-Investigator. *A randomized, multicenter, double-blind, two-arm, multicenter, placebo-controlled study to assess the efficacy and safety of EN3324 (Axomadol) in subjects with moderate to severe chronic low back pain.*

27. GlaxoSmithKline, Protocol MD 7110852, Phase IIB, 2009-2012
Principal Investigator. *A dose-ranging study of pazopanib eye drops vs. ranibizumab intravitreal injections for the treatment of neovascular AMD.*

28. Genentech, Protocol FVF4579g (HARBOR), Phase III, 2009-2012
Sub-Investigator. *A double-masked, multicenter, randomized, active treatment-controlled study of the efficacy and safety of 0.5 mg and 2.0 mg ranibizumab administered monthly or on an as needed basis (PRN) in patients with subfoveal neovascular AMD.*

29. Lux Biosciences, Inc., Protocol LX211-11, Phase III, 2011-2013
Sub-Investigator. *A multicenter, double-masked, parallel group, placebo-controlled study to assess the efficacy and safety of Voclosporin as therapy in subjects with active noninfectious intermediate, posterior or pan-uveitis.*

30. Lpath, Protocol LT1009-Oph-003 (NEXUS), Phase IIA, 2011-Present
Sub-Investigator. *A multicenter, masked, randomized, comparator-controlled study evaluation Isonep™ (sonepcizumab [LT1009]) as either monotherapy or adjunctive therapy to Lucentis or Avastin versus Lucentis or Avastin alone for the treatment of subjects with choroidal neovascularization secondary to AMD.*

31. Alimera, Protocol C-01-11-008, Extension Study, 2011-2013
Sub-Investigator. *An open-label, multicenter, extension study of the safety and utility of the new inserter of Iluvien® (Fluocinolone Acetonide Intravitreal Insert) 0.19mg and the safety of Iluvien® in subjects with DME.*

32. EyeGate Pharmaceuticals, Protocol EGP-437-004, Phase III, 2012-2013
Sub-Investigator. *A prospective, multi-center, randomized, double-masked, positive controlled, clinical trial designed to evaluate the safety and efficacy of iontophoretic dexamethasone phosphate ophthalmic suspension (1%) in patients with non-infectious anterior segment uveitis*

33. Quark Pharmaceuticals, Protocol QRK202 (MATISSE), Phase II, 2012-2013
Sub-Investigator. *An open-label dose escalation study of PF-04523655 (Stratum I) combined with a prospective, randomized, double-masked, multi-center, controlled study (Stratum II) evaluating the efficacy and safety of PF-04523655 alone and in combination with ranibizumab versus ranibizumab alone in diabetic macular edema*

34. Xoma, Protocol X052130/CL3-78989-005, Phase III, 2012-Present
Principal Investigator. *A randomized, double-masked, placebo-controlled study of the safety and efficacy of gevokizumab in the treatement of active non-infectious intermediate, posterior, or pan-uveitis*

35. Pfizer, Protocol B1181003-1050, Phase II, 2012-2013
Sub-Investigator. *A phase 2, multi-center, randomized, double-masked, placebo-controlled, multi-dose study to investigate the efficacy, safety, pharmacokinetics and pharmacodynamics of RN6G (PF-04382923) in subjects with geographic atrophy secondary to age-related macular degeneration*

36. Xoma, Protocol X052131/CL3-78989-005 (EYEGUARD™-C), Phase III, 2012-Present
Principal Investigator. *A randomized, double-masked, placebo-controlled study of the safety and efficacy of gevokizumab in the treatment of subjects with non-infectious intermediate, posterior, or pan- uveitis currently controlled with systemic treatment*

37. Regeneron Protocol VGFTe-AMD-1124 ((RE-VIEW), Phase IV, 2012-Present
Sub-Investigator. *Rigorous evaluation of vision and safety with intravitreal afliberecept injection dosed every 8 weeks over 2 years in neovascular AMD*

38. Merck Protocol MK8931—017 (SCH 900931, P07738), Phase 2/3, Collaborative Study, 2012-Present
Ophthalmology Investigator. *A randomized, placebo controlled, parallel-group, double blind efficacy and safety trial of MK-8931 in subjects with mild to moderate Alzheimer's disease*

39. Ophthotech OPH1003, Phase III, 2013-Present
Sub-Investigator. *A randomized, double-masked, controlled trial to establish the safety and efficacy of intravitreous administration of Fovista ™ (Anti-PDGF-B pegylated aptamer) administered in combination with Lucentis® compared to Lucentis® monotherapy in subjects with subfoveal neovascular macular degeneration*

ABSTRACTS

01. Wong CG, **You TT**, Ghosen C, Ton L, You L, Burke J, Wheeler L. *Experimental CNV in Cynomologous Monkey after Sustained Release of VEGF & bFGF within the Suprachoroidal Space.* Association for Research in Vision and Ophthalmology Meeting; May 2011. Abstract

02. Wong CG, **You TT**, Carvalho RAP. Natural history of progressive experimental CNV in the rabbit after sustained release of both VEGF and bFGF within the supra-choroidal space. Association for Research in Vision and Ophthalmology Meeting, May 2009. Abstract

03. Wong CG, Bruice TC, **You TT**. Experimental CNV after transcleral implantation of VEGF/bFGF-implant within the suprachoroidal space for defining potential long-term synergistic actions of ranibizumab (Lucentis) with small low-cost molecules in ameliorating wet AMD. Association for Research in Vision and Ophthalmology Meeting, May 2008. Abstract

04. **You TT**, Wong CG, Fedoruk T, Bonakdar M. Comparison of Lucentis and Avastin in the suprachoridal VEGF/bFGF-implant rabbit CNV model provides a potential standardized pre-clinical approach in the rational development of more effective QSAR-based drugs, sustained release formulations, and drug delivery systems for ameliorating AMD. Association for Research in Vision and Ophthalmology Meeting, 2007. Abstract

05. Gupta G, Donahue JP, Andorsky S, **You TT**. Profile of the retina by optical coherence tomography in the pediatric age group. Association for Research in Vision and Ophthalmology, Ft. Lauderdale, Florida; May 1, 2005. Abstract

06. Gupta G, and **You T**. Vitreous Hemorrhage in age-related macular degeneration. New England Ophthalmological Society, Boston, Massachusetts; May 2004. Abstract

07. **You TT** and Itturiaga J. "The Range of Abnormalities in *Drosophila* 1(1)ts-726 after High Temperature Shock Treatments." California Academy of Science Meeting, Los Angeles, California; 1984. Abstract

08. **You T** and Itturiaga J. "Variations in Bristle Pattern After High Temperature Treatment in *Drosophila melanogaster*." American Academy of Science Meeting, New York, New York; 1984. Abstract

PAPERS AND PUBLICATIONS

01. **You TT**, Youn DW, Chen S, Alexandrescu B, Casiano ME, Maggiano JM. Intraocular penetration by acupuncture needle. (submitted for publication, *Retina*)

02. Ambati J, Gragoudas ES, Miller JW, **You TT**, Miyamoto K, Delori FC, Adamis AP. Transscleral delivery of bioactive protein to the choroid and retina. *Invest Ophthalmol Vis Sci* 2000 Apr; 41(5):1186-91.

03. Arroyo JG, **You TT**, Bossi KE. Illuminated lens fixator for bimanual pars plana lensectomy. *Ophthalmic Surg Lasers* 2001 Sep-Oct;32(5):438-40.

04. Rumeldt S, **You TT**, Remulla HD, Rubin PAD, Jakobiec FA. Prepartum mixed type cavernous-capillary hemangioma arising in nevus flammeus. *Ophthalmology* 1999;106:1219-22.

05. **You TT** and Power W. Choroidal detachments and uveal effusion syndrome. In: *Principles and Praxis of Ophthalmology* Vol. 2. Albert DM & Jacobiec F (eds). Saunders. Philadelphia. 1999;1338-1351.

06. **You TT** and JG. Arroyo. Surgical approaches to managing the dislocated crystalline lens. *Int Ophthalmol Clinics* 1999;39:1-12.

07. **You TT** and Kaiser PK, Netland PA, Jakobiec FA. Neurothekeoma palpebrae: a rare nerve sheath tumor arising in the eyelid. *Ophthal Plast Reconstr Surg*. 1999;6:448-9.

08. **You TT** and Young LHY. Retinal manifestations of gastrointestinal disorders. *Int Ophthalmol Clinics* 1998;38:197-220.

09. **You TT**, et al. Corneal Abrasion Patching Study Group. A study of topical nonsteroidal anti-inflammatory drops and no pressure patching in the treatment of corneal abrasions. *Ophthalmol 1997;* 104: 1353-59.

10. **You, TT** and Pavan-Langston D. Chronic unilateral keratitis in a young man. *Dig J Ophthalmol* 1995 October 25;Vol. 1. Issue 2.

11. **You, TT** and Dohlman CH. Progressive corneal opacification and arthropathy. *Dig J Ophthalmol* 1995 August 12;Vol. 1, Issue 1.

12. **You TT**, Choi JC, Partington MA, Whitaker LA, Shore JW. "Ophthalmic Findings Associated with Unilateral Non-compensational Plagiocephaly." Association for Research in Vision and Ophthalmology, Fort Lauderdale, Florida; 1995. Abstract

13. **You, TT** and Pavan-Langston D. Immune reactions in corneal herpetic disease. *Int Ophthalmol Clinics* 1996;36: 31-39.

14. Menzin AW, **You TT**, Deger RB, J.J. Brooks, S.A. King. Sarcoidosis in a uterine leiomyoma. *Int J Gynaecol Obstet 1995;*48: 79-84.

15. Trojanowski JQ, Mantione JR, Lee JH, Seid DP, **You TT**, Inge LJ, Lee VMY. Neurons derived from a human teratocarcinoma cell line establish molecular and structural polarity following transplantation into the rodent brain. *Exp Neurology* 1993;122: 283-94.

POSTERS & PRESENTATIONS

01. *Updates in Retina Care: Macular Degeneration and Implantable Miniature Telescope*
Course Director. Retina Care Symposium, Costa Mesa, California; December 5, 2013.

02. *Healthcare*
Invited speaker. Third Annual Yorba Linda High School Career Day, Yorba Linda, CA; November 13, 2013.

03. *Updates in Macular Degeneration*
Invited speaker (JCAPHO). South Coast Eye Center, Laguna Hills, California; November 8, 2013.

04. *Cataract Surgery: Retinal Perils, Risks* and Complications.
Invited speaker. NVision Centers, Costa Mesa, California; August 22, 2013.

05. *Retinopathy of Prematurity and Eye Care for Infants*
Invited speaker. Anaheim Regional Medical Center, Anaheim, California; February 21, 2013.

06. *Healthcare*
Invited speaker. Second Annual Yorba Linda High School Career Day, California; November 1, 2012.

07. *Iontopheretic Dexamethasone Phosphate Ophthalmic Suspension in Patients with Non-Infectious Anterior Segment Uveitis: Phase III Data.* Anaheim, California; October 3, 2012.

08. *Updates in Age-Related Macular Degeneration*
Invited speaker. Forest Home Conference Center, Forest Falls, California; July 5, 2012.

09. *Update on Retinal Venocclusive Diseases*
Guest speaker (JCAPHO). South Coast Eye Medical Centers, Laguna Hills, California; March 9, 2012.

10. *Healthcare*
Invited speaker. First Annual Yorba Linda High School Career Day, California; November 8, 2011.

11. *Management of Ophthalmic Emergencies*
Invited speaker. Forest Home Conference Center, Forest Falls, California; July 5, 2011.

12. *Retinal Disease Management*
Invited Speaker, Fuentes de Gracia Hospital Grand Rounds. Chimaltenango, Guatemala; March 2011.

13. *Diabetes and the Eye*
Invited Speaker. St. Joseph's Hospital, Orange, California; February 26, 2011.

14. *Overcoming Retina Hurdles to 20/20 Vision for Your Patients*
Invited Speaker. Orange County Optometric Society, Western Medical Center, California; August 8, 2010

15. *Diabetes and the Eye*
Invited Speaker. St. Joseph's Diabetes Day Conference, St. Joseph Medical Center, Orange, California; February 26, 2010.

16. *Retinopathy of Prematurity and Other Ocular Anomolies*
Invited Speaker. Anaheim Regional Medical Center, Anaheim, California; October 27, 2009.

17. Co-Moderator, Day of Ophthalmology. St. Joseph's Hospital, Orange, California; October 3, 2009.

18. *Retinopathy of Prematurity and Neonatal Eye Diseases*
Invited Speaker. Children's Hospital of Orange at Mission Viejo, California; September 28, 2009.

19. *Retinopathy of Prematurity and Neonatal Eye Diseases*
Invited Speaker. Department of Neonatology, Childrens' Hospital of Orange County, California; July 13, 2009.

20. *Updates in Ophthalmic Care*
Invited Speaker, Fuentes de Gracia Hospital Grand Rounds, Chimaltenango, Guatemala; July 2009.

21. *Updates on New Treatment for Retinal Diseases*
Invited Speaker. TLC Annual Symposium, Anaheim, California; June 7, 2009.

22. *Macular Degeneration*
Invited Speaker, Foundation for Fighting Blindness. Low Vision Symposium, Southern California College of Optometry, Fullerton, California; May 9, 2009.

23. *The Refractive Surgery Retinal Evaluation: Pearls and Pitfalls*
Invited Speaker. TLC, Newport Beach, California; April 22, 2009.

24. *Retinal Disease Update*
Invited Speaker. Fuentes de Gracia Hospital Grand Rounds, Chimaltenango, Guatemala. August 8, 2008.

25. *Emerging Treatment Strategies for Exudative AMD.*
Novartis Speaker Program. Costa Mesa, California; March 12, 2008.

26. *Emerging Treatment Strategies for Exudative AMD.*
Novartis Speaker Program. Newport Beach, California; February 20 2008.

27. *Retinopathy of Prematurity and Other Ocular Anomalies*
Invited Speaker. Children's Hospital of Orange at Mission. Mission Viejo, California; February 20, 2007.

28. *Toxoplasma Uveitis*
Invited Speaker, Continuing Medical Education Lecture. Children's Hospital of Orange County, Orange, California; October 23. 2006

29. *Retinopathy of Prematurity*
Invited Speaker. Anaheim Regional Medical Center, Anaheim, California; March 14, 2006.

30. *Retinopathy of Prematurity and Neonatal Eye Diseases*
Invited Speaker. Hoag Presbyterian Hospital, Newport Beach, California; July 12, 2005.

31. *The Great Debates: Controversies in Retinal Disease 2005*
Invited Speaker, Medical Education Seminar. University of California, Irvine, Beckman Laser Center, Irvine, California; March 26, 2005.

32. *Pediatrics Case Conference*
Invited Speaker. Rhode Island Hospital, Providence, Rhode Island; January 20, 2003.

33. *Advances in Retina*
Rhode Island Eye Institute, Providence, Rhode Island; 2002.

34. *Posterior Segment*
Posterior Segment Rounds, Central Oregon Optometric Association, Redmond, Oregon; 2001.

35. *Medicine 2000*
Oregon Society of Medical Assisting Conference, Eugene, Oregon; 2000.

36. *Retinal Diagnoses*
Pacific Northwest Conference, Bend, Oregon; 2000.

37. *Retinal Surgery throughout the Ages*
Lane County Optometric Society Meeting, Eugene, Oregon; 1999.

38. **You TT** and Arroyo JG. Surgical approaches to dislocated lenses. Annual Fellows' Conference, Massachusetts Eye & Ear Infirmary, Boston, Massachusetts; 1998.

39. **You TT** and Young LHY. "Retinal Manifestations of Gastrointestinal Disorders." Biennial Residents' Conference. Massachusetts Eye & Ear Infirmary, Boston, Massachusetts;1997.

40. **You TT**, R.N. Hogan, C.S. Foster, C.H. Dohlman. "Corneal Injury in Stevens-Johnson Syndrome." Contact Lens Association of Ophthalmologists Meeting, Las Vegas, Nevada; 1997. Poster

41. **You TT**, Hogan RN, Yuhan KR, Foster CS, C.H. Dohlman. "A Clinicohistopathologic Study of Cornea in Erythema Multiforme Major." Academy of Ophthalmology Meeting, Chicago, Illinois; 1996. Poster

42. **You TT**, Hogan RN, Foster CS, Dohlman CH. "Keratopathy in Stevens-Johnson Syndrome: Histopathologic Study of Diseased Cornea." Association for Research in Vision and Ophthalmology, Fort Lauderdale, Florida; 1996. Poster

43. **You TT** and Pavan-Langston D. "Sterile Inflammatory Reactions in Herpes Keratitis." Biennial Residents' Day Conference. Massachusetts Eye & Ear Infirmary, Boston, Massachusetts; 1995.

44. Navon S, **You TT**, Chynn EW. "Eye Examination." NPACE Skills Building Seminar, Framingham, Massachusetts; 1995.

45. *Cognitive Decision Making - A Computer Based Model*
Society of General Internal Medicine Meeting, Washington, DC; 1994.

46. **You TT**, Partington MA, Whitaker LA. "Congenital Torticollis and Plagiocephaly: Clinically Frequent Association." 51st American Cleft Palate and Craniofacial Association Conference, Toronto, Canada; 1994.

47. *Bacterial Utilization of Dissolved Organic Matter in a Natural, Oligotrophic Aquatic System*
California Academy of Science Meeting, Los Angeles, California; 1981.

CALIFORNIA STATE BOARD OF OPTOMETRY

STATE BOARD OF OPTOMETRY
2450 DEL PASO ROAD, SUITE 105, SACRAMENTO, CA 95834
P (916) 575-7170 F (916) 575-7292 www.optometry .ca.gov

Continuing Education Course Approval Checklist

Title: Cataract & Refractive Surgery
Provider Name: Dr. Murad Sunalp, M.D.

☒Completed Application
- Open to all optometrists? ☒Yes ☐No
- Maintain record agreement? ☒Yes ☐No

☒Detailed Course Description
☐PowerPoint and/or other presentation materials
☒Advertising (optional)
☒CV for EACH course instructor
☒License Verification for each course instructor
- Disciplinary History? ☐Yes ☒No

Cashiering and Board Use Only			
Receipt #	Payor ID	Beneficiary ID	Amount
1-1275	6164073	349933	50

BUSINESS, CONSUMER SERVICES, AND HOUSING AGENCY

GOVERNOR EDMUND G. BROWN JR.

OPTOMETRY

STATE BOARD OF OPTOMETRY
2450 DEL PASO ROAD, SUITE 105, SACRAMENTO, CA 95834
P (916) 575-7170 F (916) 575-7292 www.optometry.ca.gov

(6164073)

CONTINUING EDUCATION COURSE APPROVAL APPLICATION

$50 Mandatory

Pursuant to California Code of Regulations (CCR) § 1536, the Board will approve continuing education (CE) courses after receiving the applicable fee, the requested information below and it has been determined that the course meets criteria specified in CCR § 1536(g).

In addition to the information requested below, please attach a copy of the course schedule and topical outline of the subject matter. Applications must be submitted 45 days prior to the course presentation date.

Please type or print clearly.

Course Title	Course Presentation Date
Cataract & Refractive Surgery	06/02/2016

Course Provider Contact Information

Provider Name

Murad (First) Sunalp (Last) A (Middle)

Provider Mailing Address

Street 880 E Merritt Ave #109 City Tulare State Ca Zip 93277

Provider Email Address slv@sunalplaservision.com

Will the proposed course be open to all California licensed optometrists?	☒ YES ☐ NO
Do you agree to maintain and furnish to the Board and/or attending licensee such records of course content and attendance as the Board requires, for a period of at least three years from the date of course presentation?	☒ YES ☐ NO

Course Instructor Information

Please provide the information below and attach the curriculum vitae for each instructor or lecturer involved in the course. If there are more instructors in the course, please provide the requested information on a separate sheet of paper.

Instructor Name

Murad (First) Sunalp (Last) A (Middle)

License Number A36954	License Type MD
Phone Number (559) 688-2020	Email Address slv@sunalplaservision.com

I declare under penalty of perjury under the laws of the State of California that all the information submitted on this form and on any accompanying attachments submitted is true and correct.

Signature of Course Provider — *Date* 4/21/16

Form CE-01, Rev. 2/16

OPTOMETRY

STATE BOARD OF OPTOMETRY
2450 DEL PASO ROAD, SUITE 105, SACRAMENTO, CA 95834
P (916) 575-7170 F (916) 575-7292 www.optometry.ca.gov

CONTINUING EDUCATION COURSE APPROVAL APPLICATION

$50 Mandatory

Pursuant to California Code of Regulations (CCR) § 1536, the Board will approve continuing education (CE) courses after receiving the applicable fee, the requested information below and it has been determined that the course meets criteria specified in CCR § 1536(g).

In addition to the information requested below, please attach a copy of the course schedule and topical outline of the subject matter. Applications must be submitted 45 days prior to the course presentation date.

Please type or print clearly.

Course Title	Course Presentation Date
Cataract & Refractive Surgery	06/02/2016

Course Provider Contact Information

Provider Name

Murad (First) Sunalp (Last) A (Middle)

Provider Mailing Address

Street 880 E Merritt Ave #109 City Tulare State Ca Zip 93277

Provider Email Address slv@sunalplaservision.com

Will the proposed course be open to all California licensed optometrists?	☒ YES ☐ NO
Do you agree to maintain and furnish to the Board and/or attending licensee such records of course content and attendance as the Board requires, for a period of at least three years from the date of course presentation?	☒ YES ☐ NO

Course Instructor Information

Please provide the information below and attach the curriculum vitae for each instructor or lecturer involved in the course. If there are more instructors in the course, please provide the requested information on a separate sheet of paper.

Instructor Name

Murad (First) Sunalp (Last) A (Middle)

License Number A36954	License Type MD
Phone Number (559) 688-2020	Email Address slv@sunalplaservision.com

I declare under penalty of perjury under the laws of the State of California that all the information submitted on this form and on any accompanying attachments submitted is true and correct.

Signature of Course Provider *Date* 4/21/16

- **Preloaded HOYA Lens for Standard Cataract Procedures**

While there are many options available to standard lens exchange procedures, the HOYA lens is a superior choice for several reasons. Due to a unique manufacturing process, the preloaded lenses are guaranteed to be sterile at time of insertion. From the manufacturing lab to the surgical procedure, the lens in never exposed to contact with humans or the environment, greatly reducing the incidence of infection or any other form of contamination. The improved insertion device is designed to give surgeons more accuracy and ease when inserting the device, and the smaller incision size required increase patient comfort, decreases healing time, and results in fewer post-operative complications.

- **NEW Multifocal and Toric Intraocular Lens Correction**

Substantial advances have been made intraocular lens technology. While we can never guarantee that a patient will be free from glasses, multifocal lenses can greatly increase chances of independence from glasses and contacts for daily activities. Astigmatism correcting Toric lenses can improve distance vision when appropriately indicated. These options are not a solution for all cataract patients, but understanding this technology and having the widest availability of surgical solutions provides the highest caliber of patient care.

- **Co-Management Cataract and LASIK Surgery**

Reinforcing the MD-OD relationship in regards to patient care. Indications and contraindications for cataract and refractive surgery, opportunities to improve surgical results based upon proper testing, diagnosis, and communication between the surgical and optometric teams.

- **NEW Sunalp ReSure Sealant Technique™**

ReSure Sealant is indicated for intraoperative management of clear corneal incision (up to 3.5mm) with a demonstrated wound leak for which a temporary dry surface can be achieved, in order to prevent postoperative fluid egress from such incisions following cataract surgery with intraocular lens placements in adults. It can take one to two minutes to completely dry the surface of the cornea following stromal hydration, a significant time given the short overall length of surgery. Applying two cautery spots will induce wound apposition and temporarily seal the wound, while at the same time preparing the surface of the cornea for a the ReSure Sealant. The use of cautery to close the wound, followed by application of the ReSure Sealant, results in a fast and effective means of achieving wound closure and does not appear to cause any astigmatism or increased discomfort for the patient.

- **NEW SmartDrop™ Technology**

SmartDrops™ is a patent pending pharmaceutical solution matrix technology created specifically for stabilizing multiple active pharmaceutical ingredients that do not typically mix. The technology micronizes the particles to enhance solubility, create uniform distribution, balance the pH, and maintain a specific gravity in order to obtain one complete isotonic solution having the ideal osmolarity. SmartDrops™ is designed to require 50% fewer drops to be administered by patients and may provide significant cost savings up to 75% compared to traditional post-surgery eye drop treatements.

SunalpLaserVision
The Valley's Eye Experts

880 E. Merritt Avenue, Ste. 109
Tulare, California 93274-2200
Offices in Bakersfield, Tulare and Visalia

MURAD A. SUNALP, M.D. (OXFORD), M.B.A., F.A.C.S.
BOARD-CERTIFIED OPHTHALMOLOGY
REFRACTIVE FELLOWSHIP
Ph: (559) 688-2020
Fax: (559) 688-8526
Cell: (310) 948-3937
Email: slv@sunalplaservision.com
Web: www.sunalplaservision.com

4/21/16

Dear XXXXXX,

We would like to cordially invite you to the Sunalp Laser Vision CE Lecture, Spring 2016!

In appreciation for our mutual hard work, and care of patients in the San Juaquin Valley, we would be honored to have you join us in an evening of food, drink, networking, and education! As we each strive to provide the highest level of care in our individual practices, it is important that we not only work together, but make a concerted effort to offer the most comprehensive and up-to-date procedures available. The SLV lecture will provide a positive environment for professional interaction, as well as a stimulating evening of industry education.

As you are probably aware, Sunalp Laser Vision has been providing eye care in Tulare and the surrounding area for over 32 years. Our Tulare facility was remodeled for our use in 2006, and our Visalia location recently opened. In addition to our two permanent facilities, we have auxiliary offices in Porterville and Bakersfield for the added convenience of your patients.

Dr. Murad A. Sunalp's specialized training has given the community access to ophthalmic laser surgery using VISX and LASIK Excimer Laser systems, up-to-the minute cataract management using multifocal and toric intraocular lens implants; and glaucoma and diabetic eye care. Dr. Sunalp has not only been able to demonstrate the highest caliber of surgical expertise, but has continued to help lead the field in innovations.

We are also proud to introduce the newest addition to our team, Dr. Manpreet Rehal, a Central Valley native. After completing her undergraduate studies at CSU Stanislaus, Dr. Rehal continued to the Illinois College of Optometry. While very skilled in the optometric field, she also contributes to our surgical staff, specializing in the co-management care of LASIK, PRK, cataract, pterygium, and blepharoplasty patients.

TOPICS WILL INCLUDE:

- **NEW Endolaser for Symptomatic Vitreous Floaters**
- **NEW Sunalp ReSure Sealant Technique™**
- **Preloaded HOYA Lens for Standard Cataract Procedures**
- **NEW Multifocal and Toric Intraocular Lens Correction**
- **Co-Management Cataract and LASIK Surgery**
- **NEW Sunalp Protocol™ Avastin Injections**
- **NEW Glaucoma iStents**
- **NEW SmartDrop™ Technology**

WHERE: **"The Vintage Press," 216 N Willis St, Visalia Ca 93291**
WHEN: **Thursday, June 1st, 6 – 9:00 P.M.**
RSVP: **(559) 688-2020 ***By Friday May 13th**

We look forward to seeing you there!!!!

Sincerely,

Murad A. Sunalp
M.D., M.B.A., FACS

Manpreet Rehal
O.D.

SunalpLaserVision.com
The Valley's Eye Experts

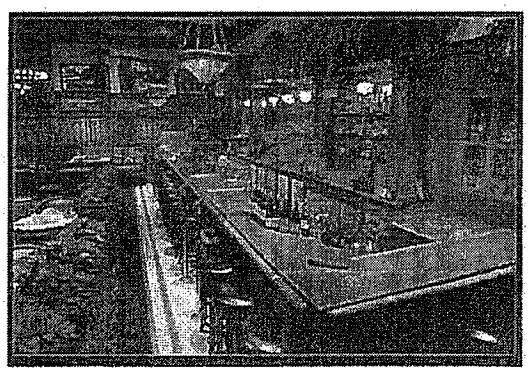
SunalpLaserVision 32 years Serving The Valley

WE WOULD LIKE TO INVITE YOU TO OUR SPRING 2016 CONTINUING EDUCATION EVENT!

When:

Thursday, June 2nd 6 – 9:30 PM

Where:



The Vintage Press, Visalia

Topics:

- NEW Endolaser for Symptomatic Vitreous Floaters
- NEW Sunalp ReSure Sealant Technique™
- Preloaded HOYA Lens for Standard Cataract Procedures
- NEW Multifocal and Toric Intraocular Lens Correction
- Co-Management Cataract and LASIK Surgery
- NEW Sunalp Protocal™ Avastin Injections
- NEW Glaucoma iStents

RSVP: 559-688-2020

EAT, NETWORK, LEARN, AND ENJOY!!!!

Murad A. Sunalp,

M.D., M.B.A., M.A., B.M., B.Ch., FACS

Sunalp Laser Vision • 880 East Merritt Avenue • Tulare, CA 93274
(800) 367-3363 • (559) 688-2020 • sunalp@aol.com

OBJECTIVE

Seeking professional opportunities in Ophthalmic surgical applications and senior healthcare administration

SKILLS

- Four years experience during post-doctoral fellowship and residency at the Estelle Doheny Eye Institute
- Nearly thirty years experience in private practice surgical Ophthalmology
- Highly skilled in the use of laser-based surgical and optical imaging equipment
- Conducted research on improving Ophthalmic surgical instrumentation
- Fluent in Turkish, English, German

EDUCATION

Oxford University
St. John's College
Oxford, England
October 1972 - July 1978

Oxford University Medical School
John Radcliffe Hospital
Headington, England
July 1978 - June 1980

Stanford University School of Medicine
Department of Ophthalmology
Stanford, California
Summer 1977 & Summer 1981

University of Southern California
Department of Ophthalmology
Doheny Eye Institute
Los Angeles, California
July 1980 - July 1985

University of California - Los Angeles
Anderson School of Business M.B.A.
Los Angeles, California
July 2003 - January 2005

University of Tennessee
College of Business Administration Physican Executive M.B.A.
Knoxville, Tennessee
January 2012 - December 2012

PROFESSIONAL EXPERIENCE

Internship
University of Southern California
Department of Ophthalmology
Los Angeles, California
June 1980 - June 1981

Fellowship
Estelle Doheny Eye Foundation
Retina Research
Los Angeles, California
July 1981 - June 1982

Residency
University of Southern California
Department of Ophthalmology
Doheny Eye Institute
Los Angeles, California
July 1982 - June 1985

Private Practice
Sunalp Laser Vision
880 East Merritt Avenue
Suite 109
Tulare, California
November 1985 - Present

ASSOCIATIONS/MEMBERSHIPS

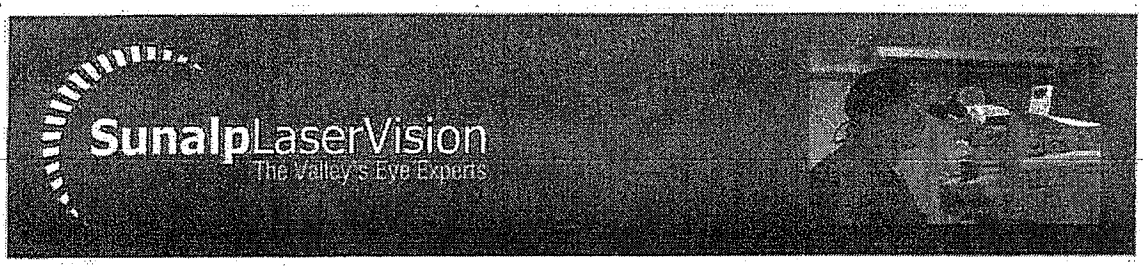
Fellow, American Academy of Ophthalmology (AAO)
Fellow American College of Surgeons
Member, Royal College of Physicians - England
Member, Royal College of Surgeons - England
Member, California Association of Ophthalmology
Fellow, Royal College of Ophthalmologists - England (FRCO)
Clinical Professor of Ophthalmology - U.C. Berkeley School of Optometry
Member, American Society of Cataract & Refractive Surgery (ASCRS)
Staff Member, Tulare Regional Medical Center - Tulare, CA
Staff Member, Sierra View District Hospital - Porterville, CA
Staff Member, Hanford Community Medical Center - Hanford, CA

LICENSES:

California, 1980
Turkey, 1989
United Kingdom, 1978
Hawaii, 2014
Florida, 2015

RESEARCH

- IOL/Phaco
- Avastin injections
- Scuba Contact Lens
- Refractive Surgery
- Tass syndrome
- Ophthalmic Instruments



Murad A. Sunalp, M.D., B.M., B. Ch.
M.D., M.A. (Oxford) F.A.A.O (USC)
FRCOphth (UK)
F.R.C.S., L.R.C.P. (London)

Sequoia Eye Center Medical Clinic / Sunalp Laser Vision / Sunalp Vision Center / Oxford NuVision Laser Medical Center
880 East Merritt Avenue • Tulare, California 93274
(800) 367-3363 • (559) 688-2020 • www.SunalpLaserVision.com

EXPERTISE

Ophthalmology, with special interest in ophthalmic lasers, state-of the-art cataract surgery with multifocal and toric intraocular lenses, VISX LASIK Excimer Laser with CustomVue, and glaucoma surgery

EDUCATION

Oakham Private Boarding School
Rutland, United Kingdom
September 1969 – July 1971

St. John's College, Medical School
Oxford University, England
October 1972 – July 1978

Oxford University Medical School
John Radcliffe Hospital
Headington, England
July 1978 – June 1980

Stanford University School of Medicine
Department of Ophthalmology
Stanford, California
Summer 1977 & Summer 1981

University of Southern California
Department of Ophthalmology / Doheny Eye Institute
Los Angeles, California
July 1980 – July 1985

U.C.L.A. Anderson School of Business M.B.A.
Los Angeles, California
July 2003 – Pending

DEGREES & DIPLOMAS

B.A. Honors, Physiology (Oxford) • July 1975

M.A. (Oxford) • July 1975

B.M., B. Ch. (Oxford) • July 1978

L.R.C.P. (London), M.R.C.S. (England), (M.D.) • July 1978

E.C.F.M.G. • July 1978

V.Q.E. • September 1979

F.L.E.X. • 1981

Fellow of the American Academy of Ophthalmology, FAAO • 1988

Fellow of the Royal College of Ophthalmology, England, FRCO • 1990

LANGUAGES

Turkish, English, German, Spanish

HONORS

American Field Service Scholarship of U.S.A. • 1969

O.P.O.S. Scholarship for U.K. • 1969

MEDICAL LICENSES

England U.K. – B.M. B. Ch. • 1978

California, U.S.A. – M.D. • 1981

Board Certified – American Board of Ophthalmology – F.A.O.O. • May 19, 1988

Board Certified in Ophthalmology, Turkey • 1989

Fellow of the Royal College of Ophthalmologists, United Kingdom – FRCO • 1990

ECFMG 302-986-5

POST-QUALIFICATION APPOINTMENTS

HOUSE SURGEON:	Mr. J.I.M. Hadfield, F.R.C.S., F.R.C.S.E. Regional Advisor to Royal College of Surgeons, Bedford General Hospital August 1978 – January 1979
HOUSE PHYSICIAN:	Dr. S.C. Truelove, M.D., F.R.C.P. May Reader in Clinical Medicine, and Drs. C.W. Burke and R.C. Turner The Radcliffe Infirmary, Oxford February 1979 – July 1979
ANATOMY INSTRUCTOR AND TUTOR:	Professor C.B. Phillips, F.R.C.P. Oxford University, Department of Anatomy August 1979 – January 1980
SENIOR HOUSE OFFICER:	Professor R.B. Duthie, F.R.C.S., F.R.C.S.E., Ch.M., R.A.C.S., Nuffield Professor of Orthopedic Surgery, University of Oxford February 1980 – July 1980

INTERNSHIP

University of Southern California
Department of Ophthalmology
Los Angeles, California
June 1980 – June 1981

FELLOWSHIP

Estelle Doheny Eye Foundation
Los Angeles, California
Retina Research
July 1981 – June 1982

RESIDENCY

University of Southern California
Department of Ophthalmology / Doheny Eye Institute
Los Angeles, California
July 1982 – June 1985

PROFESSIONAL EXPERIENCE

Sequoia Eye Center Medical Clinic / Sunalp Laser Vision / Sunalp Vision Center / Oxford NuVision Laser Medical Center
880 East Merritt Avenue
Tulare, California 93274
November 1985 – Present

ASSOCIATIONS

Fellow of the American Academy of Ophthalmology, FAAO

Royal College of Physicians, England

Royal College of Surgeons, England

Member of California Medical Society

California Association of Ophthalmology

Fellow of the Royal College of Ophthalmologists, England FRCO

Clinical Professor of Ophthalmology - School of Optometry, U.C. Berkeley

American Society of Cataract & Refractive Surgery, ASCRS

HOSPITAL STAFF PRIVILEGES

Tulare District Hospital, Tulare, CA

Sierra View District Hospital, Porterville, CA

Hanford Community Medical Center, Hanford, CA

CHARITY SURGERY

Azores, Portugal – 1989

Istanbul, Turkey – 1989

Istanbul, Turkey – 1992

Cabo San Jose, Mexico – 1994 - 1995

Mardin, Turkey – 1995

Istanbul, Turkey – 1997

Sarajevo, Bosnia – 1998

CHARITIES SPONSORED

CASA (Court Appointed Special Advocate) FOR CHILDREN 2008 - 2009

City of Hope 2008

Visalia Veterans Committee 2009

RESEARCH

- IOL/Phaco
- Refractive Surgery
- Dry Eyes
- Tolbutamide and Glaucoma
- Scuba Contact Lens
- Ophthalmic Instruments

SERVICES

OPHTHALMIC & REFRACTIVE CONSULTATIONS:
Corneal Topography (Nidek)
Pachymetry
OCT & HRT (Heidelberg)
IOL Master (Zeiss)
Visual Field
Fluorescein Angiography

OPHTHALMIC LASERS & PROCEDURES
Secondary Cataract YAG (Laserex)
Macular Degeneration (Argon)
Glaucoma Yag Laser (Lumenis)
Diabetic Argon Laser (HGM)
Glaucoma Surgical Implants:
- Ahmed Glaucoma Valve
- Mini Express Shunt

INFINITI OZII PHACO CATARACT
With Intraocular Lens Implant (IOL)
Multifocal Lenses:
- TECNIS Multifocal IOL
- ReSTOR Multifocal IOL
- Crystalens HD IOL
- Toric IOL
- Aspheric IOL

PLASTIC SURGERY
Blepharoplasty Upper & Lower Lids
Entropion & Ectropion Repair
Ptosis Repair
Pterygium with Autograft & Fibrin Glue
Lacrimal Surgery

REFRACTIVE SURGERY
CustomVue VISX Lasik
Photo-Refractive Keratoplasty (PRK)
Epilasik
Astigmatic Keratotomy (LRI)
Conductive Keratoplasty (CK)
Refractive Lensectomy
Implantable Contact Lenses (ICL)

PUBLICATIONS & STUDIES

01. Review of Diabetic Retinopathy and Its Treatment. Medical thesis, Oxford University, M. Sunalp - 1978

02. Improved Definition of the Appendix Mass and Appendectomy using thermocouple potential use submitted to the Department of Surgery, Oxford University, M. Sunalp - 1979

03. Ambulatory Treatment of Small Hyphemas (poster), American Academy of Ophthalmology, Vol. 1 M. Sunalp, P. Urea, K. Wright - November 1983

04. Inhibition of Angigenesis by a Cartilage Extract in Corneal Thermal Burns (abstract), ARVO Meeting, M. Sunalp, P. Novak, N. Sorgente - 1984

05. Pressure Effect of Tie-Over Dressing in Skin Grafts, by M. Sunalp - 1984

06. Effects of Cytotoxic Drugs on Proliferative Vitreoretinopathy in the Rabbit Cell Injection Model, Current Eye Research, Vol. 3, No. 4, Murad A. Sunalp, N. Sorgente, S.R. Ryan - 1984

07. Effect of Andriamycin on Experimental Proliferative Vitreoretinopathy in the Rabbit. Experimental Eye Research, 41, 105-115, M. Sunalp, P. Wiedeman, N. Sorgente, S.R. Ryan - 1985

08. 240 Band Modification with Scleral Buckle in Retinal Detachment, M. Sunalp - 1985

09. Inhibition of Angiogenesis on Rabbit transplant Model (abstract) ARVO meeting, M. Sunalp, P. Novak, N. Sorgente - 1985

10. Small Incision Cataract Surgery Lecture, Istanbul University, guest speaker, M. Sunalp - September 1986

11. Bed Rest versus Activity at Liberty in the Treatment of Small Hyphemas, Annals of Ophthalmology, M. Sunalp, MD, K. W. Wright, MD, P. Urrea, MD. - April 1988

12. Medical Ophthalmology Mission to the Azores with the Tulare-Angra Sister City Foundation, to perform for the first time on the island of Terceira in Portugal, cataract with implant surgery, M. Sunalp - June 1989

13. European Intraocular Lens Society Congress, Zurich, Switzerland: Surgical cataract video presentation of phacoemulsification to International Ophthalmologists, M. Sunalp. August - September 1989

14. Turkish National Ophthalmology Meeting: Poster presentation on the ophthalmology mission to the Azores and lecture presentation on phacoemulsification, surface modified lenses and implantation, Adana, Turkey, M. Sunalp - September 1989

15. Turkish-American Ophthalmology Meeting, Istanbul, Turkey - June 1990
    Lectures given by M. Sunalp:
    1. Melanoma and Laser Treatment
    2. Tumor Neovascularization
    3. Phaco IOL Cataract Extraction Lecture, slides and video

16. European Implant Society International Congress. M. Sunalp, Dublin, Ireland - September 1990
    Lectures given by M. Sunalp:
    1. Decentration Study of 5x6mm PMMA IOL's
    2. Comparison of Foldable/PMMA IOL's, Astigmatism
    3. Two Rare Cases of Hypotony
    4. Video (PHACO) Library and Competition

17. Oval in Oval Concept in 5x6mm Small Incision IOL and Oval Capsulorhexis™, Video for Dublin. Video presentation by M. Sunalp - August 1990

18. Punctal Plug Invention, Dr. Sunalp, Dr. Tajiri - September, 1989, (Patent pending)

19. Contact Lens and Scuba Diving Research - 1989 - 1990

20. Milroy's Disease, Authors - Dr. Kenneth Wright, Dr. Sunalp - 1990 (et. AL., pending.)

21. "Use of Oval Capsulorhexis, IOL Recommended." Dublin, Ireland. Ophthalmology Times, Vol.15. No. 21, November 1990, Murad A. Sunalp, MD

22. "Small Incision, single suture favored for reducing decentration." Ophthalmology Times, Vol.16. No. 17, September 1991, Murad A. Sunalp, MD

23. Turkish National Ophthalmology Meeting, Istanbul, M. Sunalp - September 1991

24. European Implant Society, Valencia, Spain - September 1991
Lectures given by M. Sunalp:
    1. Preoperative sedation in cataract surgery
    2. No suture phacoemulsification versus one suture phacoemulsification
Video presentation:
    1. No suture, Oval in Oval, Phacoemulsification

25. Guest Lecturer, Istanbul University, M. Sunalp, January 3, 1992

26. American Society of Cataract & Refractive Surgery, San Diego, California - April 1992
Video Presentation by M. Sunalp:
    1. No Suture, Oval in Oval, Phacoemulsification

27. College of Ophthalmologists, London, England - May 1992
Video Presentation by M. Sunalp:
    1. No Suture, Oval in Oval, Phacoemulsification

28. "Put a Twist on Oval Capsulorhexis," Phaco & Foldable, Vol. 5, No. 3, Murad A. Sunalp, MD - May-June 1992

29. "Oval in oval, Sutureless cataract surgery with oval capsulotomy." Ocular Surgery News, Vol. 10, No. 12, June 15, 1992, Murad A. Sunalp, MD

30. "Diode Matters." Keeler Newsletter for Microlaser Users, Vol. 1 No. 2, August 1992, Murad A. Sunalp, MD

31. Congress of the European Society of Cataract & Refractive Surgery (Formerly the European IOL Implant Council), Paris, France - September 1992
Lectures given by M. Sunalp:
    1. Small incision phacoemulsification with topical anesthesia
    2. Astigmatic comparison analysis of one suture VS. no suture phacoemulsification cataract surgery
Video presentation:
    1. No Injection, No Suture, Yes Phacoemulsification, Yes Small Incision, Yes Modified Oval Capsulorhexis

32. Congress of the European Society of Cataract & Refractive Surgery, Innsbruck, Austria - September 1993
Video Presentation by M. Sunalp:
    1. Sunalp Phacoemulsification Spatula

33. International Winter Ophthalmic Conference (IWOC) Teton Village, Wyoming - January 1994
Presented by Murad A. Sunalp, MD, Thomas Nagy, O.D., Gary Smith, O.D.
Lecture given:
    1. Radial Keratotomy (RK) VS. VISX Excimer Laser

34. "Congenital cataracts and iris coloboma rehabilitation with phaco cataract surgery, Argon laser iridioplasty and colored contact lenses." Ocular Surgery News (International Edition) Vol. 5, No. 5, May 1994, Murad A. Sunalp, MD

35. International Winter Ophthalmic Conference (IWOC), Aspen, Colorado - February 1995
Lecture given by M. Sunalp:
1. Advances in Refractive Surgery

36. EYETECH '95, New Orleans, Louisiana - June 1995
Lecture given by M. Sunalp:
1. Various Types of Refractive Surgery

37. EYETECH '95, New Orleans, Louisiana - June 1995
Lecture given by M. Sunalp:
1. Radial Keratotomy Wet Lab

38. AAO/TAOS, Chicago, Illinois - October 1996
Lecture given by M. Sunalp:
1. Vein Occlusions and Bee Venom

39. Refractive Surgery, Latin America, Colombia - November 1996
Lecture given by M. Sunalp:
1. Correction of pseudophakic myopia with RK/AK

40. Hawaiian Eye - January 1997
Lecture given by M. Sunalp:
1. Correction of pseudophakic myopia with RK/AK

41. ASCRS, Mastel Conference, Washington, D.C. - June 1997
Lecture given by M. Sunalp:
1. Correction of pseudophakic myopia with RK/AK

42. ESCRS Prague - September 1997
Lecture given by M. Sunalp:
1. Correction of pseudophakic myopia with RK/AK and simultaneous bilateral cataract extraction under general anesthesia

43. International Turkish Ophthalmology meeting, Istanbul - September 1997
Lecture given by M. Sunalp:
1. Simultaneous bilateral cataract extraction under general anesthesia

44. AAO San Francisco, California - October 1997
Lecture given by M. Sunalp:
1. Simultaneous bilateral cataract extraction under general anesthesia

45. Control of Post Cataract Surgery Pressure Spikes With Tolbutamide Drops, Clinical Study with M. Sunalp, N. Sorgente - 1998

46. Post Radial Keratotomy Cataract Surgery – Intra-operative Retinoscopy and IOL insertion, World Ophthalmology Congress, Amsterdam, Netherlands – June 1999
Lecture given by M. Sunalp

47. "Use of Intraoperative Refractive Refinement with Piggyback IOL for difficult Cataract cases," Ocular Surgery News, Vol. 17, No. 19 , October 1, 1999, Murad A. Sunalp, MD

48. First Ophthalmic International Meeting, Lisbon, Portugal - September 24-25, 1999, Azores, Portugal - October 1, 1999
Lectures given by M. Sunalp:
    1. Phacoemulsification
    2. Intra Operative Refraction
    3. Live Cataract Surgery

49. General Hospital, Cabo San Jose, Mexico - February 29, 2000
Lecture given by M. Sunalp:
    1. Dry Eyes and Glaucoma Surgery

50. ASCRS, Boston International Meeting, Film Library, Boston, Massachusetts, M. Sunalp - May 20-24, 2000

51. Doheny Eye Institute, University of Southern California, June 2000
Lecture given by M. Sunalp:
    1. Temporary IOL Insertion for difficult Post Refractive Cataract cases

52. International Cataract Symposium, Lisbon, Portugal, September 2000. Panel member

53. ASCRS San Francisco, California, Lecture / Video on Refractive Surgery, M. Sunalp - April 2003

54. AAO/TAOS Symposium Anaheim, California, "Lasik and Retinal Detachment," M. Sunalp - November 2003

55. Chinese Cultural Center Visalia, California, "Surgical Correction of Presbyopia," M. Sunalp - May 19, 2004

56. Black Sea Ophthalmology meeting, "CK vs. Lasik for treating Presbyopia and Hyperopia," M. Sunalp - August 2005

57. ASCRS / AAO Istanbul, "CK, benefits and problems", Refractive surgery lecture, M. Sunalp - May 2006

58. Doheny Eye Institute / USC, "Very high hyperopia treated with Phaco, Piggyback IOL's, and Lasik," M. Sunalp - June 2006

59. Doheny Eye Institute / USC, Alumni Meeting, "Toxic Anterior Segment Syndrome (TASS) caused by Trypan Blue: First two cases presented in the world," M. Sunalp - June 2007

60. ASCRS New Orleans, Louisiana, Intraocular surgery and Trypan blue and (TASS) – Featured in Eye Word Today (Best paper of the session), M. Sunalp - April 2008

61. International Patent on Temporary Intraoperative Refractive IOL for Cataract Surgery - April 2008

62. The American Optometric Association on Intraoperative Floppy Iris Syndrome (IFIS) and Malyugin ring, Visalia, California – April 2009
Lecture given by M. Sunalp

63. Advanced Cataract Surgery and Comanagement with Multifocal IOL's, Visalia, California - October 1, 2009
Lecture given by M. Sunalp

48. First Ophthalmic International Meeting, Lisbon, Portugal - September 24-25, 1999, Azores, Portugal - October 1, 1999
    Lectures given by M. Sunalp:
    1. Phacoemulsification
    2. Intra Operative Refraction
    3. Live Cataract Surgery
49. General Hospital, Cabo San Jose, Mexico - February 29, 2000
    Lecture given by M. Sunalp:
    1. Dry Eyes and Glaucoma Surgery
50. ASCRS, Boston International Meeting, Film Library, Boston, Massachusetts, M. Sunalp - May 20-24, 2000
51. Doheny Eye Institute, University of Southern California, June 2000
    Lecture given by M. Sunalp:
    1. Temporary IOL Insertion for difficult Post Refractive Cataract cases
52. International Cataract Symposium, Lisbon, Portugal, September 2000. Panel member
53. ASCRS San Francisco, California, Lecture / Video on Refractive Surgery, M. Sunalp - April 2003
54. AAO/TAOS Symposium Anaheim, California, "Lasik and Retinal Detachment," M. Sunalp - November 2003
55. Chinese Cultural Center Visalia, California, "Surgical Correction of Presbyopia," M. Sunalp - May 19, 2004
56. Black Sea Ophthalmology meeting, "CK vs. Lasik for treating Presbyopia and Hyperopia," M. Sunalp - August 2005
57. ASCRS / AAO Istanbul, "CK, benefits and problems", Refractive surgery lecture, M. Sunalp - May 2006
58. Doheny Eye Institute / USC, "Very high hyperopia treated with Phaco, Piggyback IOL's, and Lasik," M. Sunalp - June 2006
59. Doheny Eye Institute / USC, Alumni Meeting, "Toxic Anterior Segment Syndrome (TASS) caused by Trypan blue: First two cases presented in the world," M. Sunalp - June 2007
60. ASCRS New Orleans, Louisiana, Intraocular surgery and Trypan blue and (TASS) – Featured in Eye Word Today (Best paper of the session), M. Sunalp - April 2008
61. International Patent on Temporary Intraoperative Refractive IOL for Cataract Surgery - April 2008
62. The American Optometric Association on Intraoperative Floppy Iris Syndrome (IFIS) and Malyugin ring, Visalia, California – April 2009
    Lecture given by M. Sunalp
63. Advanced Cataract Surgery and Co management with Multifocal IOL's, Visalia, California - October 1, 2009
    Lecture given by M. Sunalp
64. Publication Journal of Cataract & Refractive Surgery - December 2010 Volume 36 Number 12 "Two cases of Toxic anterior segment syndrome from generic trypan blue"
65. ASCRS San Diego, California Universal Corneal Marker Presentation - March 26, 2011
    Lecture given by M. Sunalp
66. ASCRS San Diego, California Technique for Injecting Bevacizumab for Diabetic and Other Macular Edema Treatment – March 26, 2011 – Lecture given by M. Sunalp
67. 42nd Annual Doheny Days Conference, Universal Refractive Corneal Marker – June 11, 2011 – Lecture given Dr. Sunalp
68. 20th anniversary of LASIK and the 10th Aegean Cornea Meeting, Aegean Cornea X July 9-11

CALIFORNIA STATE BOARD OF OPTOMETRY

STATE BOARD OF OPTOMETRY
2450 DEL PASO ROAD, SUITE 105, SACRAMENTO, CA 95834
P (916) 575-7170 F (916) 575-7292 www.optometry .ca.gov

Continuing Education Course Approval Checklist

Title: Vitreo Retinal Procedures
Provider Name: Dr. Murad Sunalp, MD

☒Completed Application
- Open to all optometrists? ☒Yes ☐No
- Maintain record agreement? ☒Yes ☐No

☒Detailed Course Description
☐PowerPoint and/or other presentation materials
☒Advertising (optional)
☒CV for EACH course instructor
☒License Verification for each course instructor
- Disciplinary History? ☐Yes ☒No

Cashiering and Board Use Only			
Receipt #	Payor ID	Beneficiary ID	Amount
1-1275	1-164473	349933	50

BUSINESS, CONSUMER SERVICES, AND HOUSING AGENCY

GOVERNOR EDMUND G. BROWN JR.

OPTOMETRY

STATE BOARD OF OPTOMETRY
2450 DEL PASO ROAD, SUITE 105, SACRAMENTO, CA 95834
P (916) 575-7170 F (916) 575-7292 www.optometry.ca.gov

CONTINUING EDUCATION COURSE APPROVAL APPLICATION

$50 Mandatory

Pursuant to California Code of Regulations (CCR) § 1536, the Board will approve continuing education (CE) courses after receiving the applicable fee, the requested information below and it has been determined that the course meets criteria specified in CCR § 1536(g).

In addition to the information requested below, please attach a copy of the course schedule and topical outline of the subject matter. Applications must be submitted 45 days prior to the course presentation date.

Please type or print clearly.

Course Title	Course Presentation Date
Vitreo Retinal Procedures	06/02/2016

Course Provider Contact Information

Provider Name

Murad (First) Sunalp (Last) A (Middle)

Provider Mailing Address

Street 880 E Merritt Ave #109 City Tulare State Ca Zip 93277

Provider Email Address slv@sunalplaservision.com

Will the proposed course be open to all California licensed optometrists?	☒ YES ☐ NO
Do you agree to maintain and furnish to the Board and/or attending licensee such records of course content and attendance as the Board requires, for a period of at least three years from the date of course presentation?	☒ YES ☐ NO

Course Instructor Information

Please provide the information below and attach the curriculum vitae for each instructor or lecturer involved in the course. If there are more instructors in the course, please provide the requested information on a separate sheet of paper.

Instructor Name

Murad (First) Sunalp (Last) A (Middle)

License Number A36954	**License Type** MD
Phone Number (559) 688-2020	**Email Address** slv@sunalplaservision.com

I declare under penalty of perjury under the laws of the State of California that all the information submitted on this form and on any accompanying attachments submitted is true and correct.

Signature of Course Provider 4/21/16 ***Date***

Form CE-01, Rev. 2/16

OPTOMETRY

STATE BOARD OF OPTOMETRY
2450 DEL PASO ROAD, SUITE 105, SACRAMENTO, CA 95834
P (916) 575-7170 F (916) 575-7292 www.optometry.ca.gov

CONTINUING EDUCATION COURSE APPROVAL APPLICATION

$50 Mandatory

Pursuant to California Code of Regulations (CCR) § 1536, the Board will approve continuing education (CE) courses after receiving the applicable fee, the requested information below and it has been determined that the course meets criteria specified in CCR § 1536(g).

In addition to the information requested below, please attach a copy of the course schedule and topical outline of the subject matter. Applications must be submitted 45 days prior to the course presentation date.

Please type or print clearly.

Course Title	Course Presentation Date
Vitreo Retinal Procedures	06/02/2016

Course Provider Contact Information

Provider Name

Murad (First) Sunalp (Last) A (Middle)

Provider Mailing Address

Street 880 E Merritt Ave #109 City Tulare State Ca Zip 93277

Provider Email Address slv@sunalplaservision.com

Will the proposed course be open to all California licensed optometrists?	☒ YES ☐ NO
Do you agree to maintain and furnish to the Board and/or attending licensee such records of course content and attendance as the Board requires, for a period of at least three years from the date of course presentation?	☒ YES ☐ NO

Course Instructor Information

Please provide the information below and attach the curriculum vitae for each instructor or lecturer involved in the course. If there are more instructors in the course, please provide the requested information on a separate sheet of paper.

Instructor Name

Murad (First) Sunalp (Last) A (Middle)

License Number A36954	License Type MD
Phone Number (559) 688-2020	Email Address slv@sunalplaservision.com

I declare under penalty of perjury under the laws of the State of California that all the information submitted on this form and on any accompanying attachments submitted is true and correct.

Signature of Course Provider *Date* 4/21/16

Vitreo Retinal Course 1 Hour

- **NEW Endolaser for Vitreous Strand Floaters**

Focal endolaser photocoagulation can be used to treat patients suffering from vitreous floaters. Laser vitreolysis allows for small localized treatment and higher accuracy. The endolaser procedure does not require an incision and is a simple outpatient procedure that can be performed in office. Prior to the treatment, anesthetic eye drops are applied, with use of a biomicroscope (slit lamp) to precisely deliver treatment, floaters are broken apart and/or frequently vaporized so that they disappear or become much less bothersome.

- **NEW Sunalp Protocol™ Avastin Injections**

Avastin is the brand name for bevacizumab, a drug injected into the eye to slow vision loss in people who have "wet" age related macular degeneration (AMD). Injection of vascular endothelial growth inhibitors (VEGI) into the posterior chamber of the eye has become mainstay of treatment in diabetic retinopathy and macular degeneration. Retinal specialists typically perform these injections using a transscleral approach and manage any attendant complications. A new perilimbic approach has been developed by Murad Sunalp, MD. This approach avoids scleral and retinal injury and lessens the risk of endophthalmitis and central retinal vein occlusion.

SunalpLaserVision
The Valley's Eye Experts
880 E. Merritt Avenue, Ste. 109
Tulare, California 93274-2200
Offices in Bakersfield, Tulare and Visalia

MURAD A. SUNALP, M.D. (OXFORD), M.B.A., F.A.C.S.
BOARD-CERTIFIED OPHTHALMOLOGY
REFRACTIVE FELLOWSHIP
Ph: (559) 688-2020
Fax: (559) 688-8526
Cell: (310) 948-3937
Email: slv@sunalplaservision.com
Web: www.sunalplaservision.com

4/21/16

Dear XXXXXX,

We would like to cordially invite you to the Sunalp Laser Vision CE Lecture, Spring 2016!

In appreciation for our mutual hard work, and care of patients in the San Juaquin Valley, we would be honored to have you join us in an evening of food, drink, networking, and education! As we each strive to provide the highest level of care in our individual practices, it is important that we not only work together, but make a concerted effort to offer the most comprehensive and up-to-date procedures available. The SLV lecture will provide a positive environment for professional interaction, as well as a stimulating evening of industry education.

As you are probably aware, Sunalp Laser Vision has been providing eye care in Tulare and the surrounding area for over 32 years. Our Tulare facility was remodeled for our use in 2006, and our Visalia location recently opened. In addition to our two permanent facilities, we have auxiliary offices in Porterville and Bakersfield for the added convenience of your patients.

Dr. Murad A. Sunalp's specialized training has given the community access to ophthalmic laser surgery using VISX and LASIK Excimer Laser systems, up-to-the minute cataract management using multifocal and toric intraocular lens implants; and glaucoma and diabetic eye care. Dr. Sunalp has not only been able to demonstrate the highest caliber of surgical expertise, but has continued to help lead the field in innovations.

We are also proud to introduce the newest addition to our team, Dr. Manpreet Rehal, a Central Valley native. After completing her undergraduate studies at CSU Stanislaus, Dr. Rehal continued to the Illinois College of Optometry. While very skilled in the optometric field, she also contributes to our surgical staff, specializing in the co-management care of LASIK, PRK, cataract, pterygium, and blepharoplasty patients.

TOPICS WILL INCLUDE:

- **NEW Endolaser for Symptomatic Vitreous Floaters**
- **NEW Sunalp ReSure Sealant Technique™**
- **Preloaded HOYA Lens for Standard Cataract Procedures**
- **NEW Multifocal and Toric Intraocular Lens Correction**
- **Co-Management Cataract and LASIK Surgery**
- **NEW Sunalp Protocol™ Avastin Injections**
- **NEW Glaucoma iStents**
- **NEW SmartDrop™ Technology**

WHERE: **"The Vintage Press," 216 N Willis St, Visalia Ca 93291**
WHEN: **Thursday, June 1st, 6 – 9:00 P.M.**
RSVP: **(559) 688-2020 ***By Friday May 13th**

We look forward to seeing you there!!!!

Sincerely,

Murad A. Sunalp, M.D., M.B.A., FACS

Manpreet Rehal, O.D.

SunalpLaserVision.com
The Valley's Eye Experts

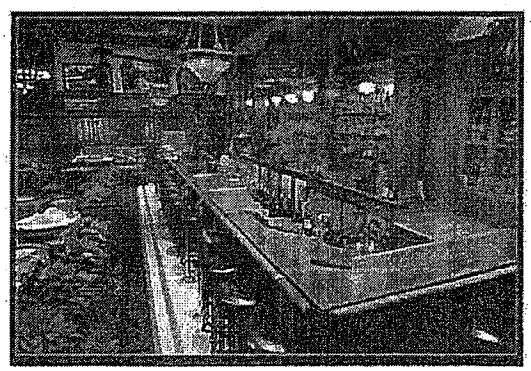
SunalpLaserVision 32 years Serving The Valley

WE WOULD LIKE TO INVITE YOU TO OUR SPRING 2016 CONTINUING EDUCATION EVENT!

When:

Thursday, June 2nd 6 – 9:30 PM

Where:



The Vintage Press, Visalia

Topics:

- NEW Endolaser for Symptomatic Vitreous Floaters
- NEW Sunalp ReSure Sealant Technique™
- Preloaded HOYA Lens for Standard Cataract Procedures
- NEW Multifocal and Toric Intraocular Lens Correction
- Co-Management Cataract and LASIK Surgery
- NEW Sunalp Protocal™ Avastin Injections
- NEW Glaucoma iStents

RSVP: 559-688-2020

EAT, NETWORK, LEARN, AND ENJOY!!!!

Murad A. Sunalp,

M.D., M.B.A., M.A., B.M., B.Ch., FACS

Sunalp Laser Vision • 880 East Merritt Avenue • Tulare, CA 93274
(800) 367-3363 • (559) 688-2020 • sunalp@aol.com

OBJECTIVE

Seeking professional opportunities in Ophthalmic surgical applications and senior healthcare administration

SKILLS

- Four years experience during post-doctoral fellowship and residency at the Estelle Doheny Eye Institute
- Nearly thirty years experience in private practice surgical Ophthalmology
- Highly skilled in the use of laser-based surgical and optical imaging equipment
- Conducted research on improving Ophthalmic surgical instrumentation
- Fluent in Turkish, English, German

EDUCATION

Oxford University
St. John's College
Oxford, England
October 1972 - July 1978

Oxford University Medical School
John Radcliffe Hospital
Headington, England
July 1978 - June 1980

Stanford University School of Medicine
Department of Ophthalmology
Stanford, California
Summer 1977 & Summer 1981

University of Southern California
Department of Ophthalmology
Doheny Eye Institute
Los Angeles, California
July 1980 - July 1985

University of California - Los Angeles
Anderson School of Business M.B.A.
Los Angeles, California
July 2003 - January 2005

University of Tennessee
College of Business Administration Physican Executive M.B.A.
Knoxville, Tennessee
January 2012 - December 2012

PROFESSIONAL EXPERIENCE

Internship
University of Southern California
Department of Ophthalmology
Los Angeles, California
June 1980 - June 1981

Fellowship
Estelle Doheny Eye Foundation
Retina Research
Los Angeles, California
July 1981 - June 1982

Residency
University of Southern California
Department of Ophthalmology
Doheny Eye Institute
Los Angeles, California
July 1982 - June 1985

Private Practice
Sunalp Laser Vision
880 East Merritt Avenue
Suite 109
Tulare, California
November 1985 - Present

ASSOCIATIONS/MEMBERSHIPS

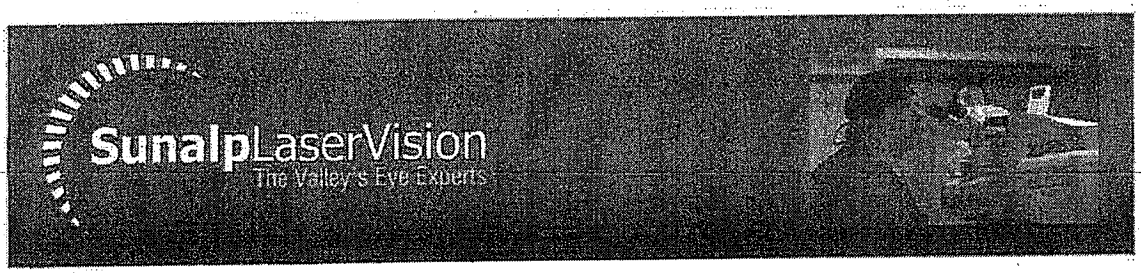
Fellow, American Academy of Ophthalmology (AAO)
Fellow American College of Surgeons
Member, Royal College of Physicians - England
Member, Royal College of Surgeons - England
Member, California Association of Ophthalmology
Fellow, Royal College of Ophthalmologists - England (FRCO)
Clinical Professor of Ophthalmology - U.C. Berkeley School of Optometry
Member, American Society of Cataract & Refractive Surgery (ASCRS)
Staff Member, Tulare Regional Medical Center - Tulare, CA
Staff Member, Sierra View District Hospital - Porterville, CA
Staff Member, Hanford Community Medical Center - Hanford, CA

LICENSES:

California, 1980
Turkey, 1989
United Kingdom, 1978
Hawaii, 2014
Florida, 2015

RESEARCH

- IOL/Phaco
- Avastin injections
- Scuba Contact Lens
- Refractive Surgery
- Tass syndrome
- Ophthalmic Instruments



Murad A. Sunalp, M.D., B.M., B. Ch.
M.D., M.A. (Oxford) F.A.A.O (USC)
FRCOphth (UK)
F.R.C.S., L.R.C.P. (London)

Sequoia Eye Center Medical Clinic / Sunalp Laser Vision / Sunalp Vision Center / Oxford NuVision Laser Medical Center
880 East Merritt Avenue • Tulare, California 93274
(800) 367-3363 • (559) 688-2020 • www.SunalpLaserVision.com

EXPERTISE

Ophthalmology, with special interest in ophthalmic lasers, state-of-the-art cataract surgery with multifocal and toric intraocular lenses, VISX LASIK Excimer Laser with CustomVue, and glaucoma surgery

EDUCATION

Oakham Private Boarding School
Rutland, United Kingdom
September 1969 – July 1971

St. John's College, Medical School
Oxford University, England
October 1972 – July 1978

Oxford University Medical School
John Radcliffe Hospital
Headington, England
July 1978 – June 1980

Stanford University School of Medicine
Department of Ophthalmology
Stanford, California
Summer 1977 & Summer 1981

University of Southern California
Department of Ophthalmology / Doheny Eye Institute
Los Angeles, California
July 1980 – July 1985

U.C.L.A. Anderson School of Business M.B.A.
Los Angeles, California
July 2003 – Pending

DEGREES & DIPLOMAS

B.A. Honors, Physiology (Oxford) • July 1975

M.A. (Oxford) • July 1975

B.M., B. Ch. (Oxford) • July 1978

L.R.C.P. (London), M.R.C.S. (England), (M.D.) • July 1978

E.C.F.M.G. • July 1978

V.Q.E. • September 1979

F.L.E.X. • 1981

Fellow of the American Academy of Ophthalmology, FAAO • 1988

Fellow of the Royal College of Ophthalmology, England, FRCO • 1990

LANGUAGES

Turkish, English, German, Spanish

HONORS

American Field Service Scholarship of U.S.A. • 1969

O.P.O.S. Scholarship for U.K. • 1969

MEDICAL LICENSES

England U.K. – B.M. B. Ch. • 1978

California, U.S.A. – M.D. • 1981

Board Certified – American Board of Ophthalmology – F.A.O.O. • May 19, 1988

Board Certified in Ophthalmology, Turkey • 1989

Fellow of the Royal College of Ophthalmologists, United Kingdom – FRCO • 1990

ECFMG 302-986-5

POST-QUALIFICATION APPOINTMENTS

HOUSE SURGEON:	Mr. J.I.M. Hadfield, F.R.C.S., F.R.C.S.E. Regional Advisor to Royal College of Surgeons, Bedford General Hospital August 1978 – January 1979
HOUSE PHYSICIAN:	Dr. S.C. Truelove, M.D., F.R.C.P. May Reader in Clinical Medicine, and Drs. C.W. Burke and R.C. Turner The Radcliffe Infirmary, Oxford February 1979 – July 1979
ANATOMY INSTRUCTOR AND TUTOR:	Professor C.B. Phillips, F.R.C.P. Oxford University, Department of Anatomy August 1979 – January 1980
SENIOR HOUSE OFFICER:	Professor R.B. Duthie, F.R.C.S., F.R.C.S.E., Ch.M., R.A.C.S., Nuffield Professor of Orthopedic Surgery, University of Oxford February 1980 – July 1980

INTERNSHIP

University of Southern California
Department of Ophthalmology
Los Angeles, California
June 1980 – June 1981

FELLOWSHIP

Estelle Doheny Eye Foundation
Los Angeles, California
Retina Research
July 1981 – June 1982

RESIDENCY

University of Southern California
Department of Ophthalmology / Doheny Eye Institute
Los Angeles, California
July 1982 – June 1985

PROFESSIONAL EXPERIENCE

Sequoia Eye Center Medical Clinic / Sunalp Laser Vision / Sunalp Vision Center / Oxford NuVision Laser Medical Center
880 East Merritt Avenue
Tulare, California 93274
November 1985 – Present

ASSOCIATIONS

Fellow of the American Academy of Ophthalmology, FAAO

Royal College of Physicians, England

Royal College of Surgeons, England

Member of California Medical Society

California Association of Ophthalmology

Fellow of the Royal College of Ophthalmologists, England FRCO

Clinical Professor of Ophthalmology - School of Optometry, U.C. Berkeley

American Society of Cataract & Refractive Surgery, ASCRS

HOSPITAL STAFF PRIVILEGES

Tulare District Hospital, Tulare, CA

Sierra View District Hospital, Porterville, CA

Hanford Community Medical Center, Hanford, CA

CHARITY SURGERY

Azores, Portugal – 1989

Istanbul, Turkey – 1989

Istanbul, Turkey – 1992

Cabo San Jose, Mexico – 1994 - 1995

Mardin, Turkey – 1995

Istanbul, Turkey – 1997

Sarajevo, Bosnia – 1998

CHARITIES SPONSORED

CASA (Court Appointed Special Advocate) FOR CHILDREN 2008 - 2009

City of Hope 2008

Visalia Veterans Committee 2009

RESEARCH

- IOL/Phaco
- Refractive Surgery
- Dry Eyes
- Tolbutamide and Glaucoma
- Scuba Contact Lens
- Ophthalmic Instruments

SERVICES

OPHTHALMIC & REFRACTIVE CONSULTATIONS:
Corneal Topography (Nidek)
Pachymetry
OCT & HRT (Heidelberg)
IOL Master (Zeiss)
Visual Field
Fluorescein Angiography

OPHTHALMIC LASERS & PROCEDURES
Secondary Cataract YAG (Laserex)
Macular Degeneration (Argon)
Glaucoma Yag Laser (Lumenis)
Diabetic Argon Laser (HGM)
Glaucoma Surgical Implants:
- Ahmed Glaucoma Valve
- Mini Express Shunt

INFINITI OZII PHACO CATARACT
With Intraocular Lens Implant (IOL)
Multifocal Lenses:
- TECNIS Multifocal IOL
- ReSTOR Multifocal IOL
- Crystalens HD IOL
- Toric IOL
- Aspheric IOL

PLASTIC SURGERY
Blepharoplasty Upper & Lower Lids
Entropion & Ectropion Repair
Ptosis Repair
Pterygium with Autograft & Fibrin Glue
Lacrimal Surgery

REFRACTIVE SURGERY
CustomVue VISX Lasik
Photo-Refractive Keratoplasty (PRK)
Epilasik
Astigmatic Keratotomy (LRI)
Conductive Keratoplasty (CK)
Refractive Lensectomy
Implantable Contact Lenses (ICL)

PUBLICATIONS & STUDIES

01. Review of Diabetic Retinopathy and its Treatment, Medical thesis, Oxford University, M. Sunalp - 1978

02. Improved Definition of the Appendix Mass and Appendectomy using thermocouple potential use submitted to the Department of Surgery, Oxford University, M. Sunalp - 1979

03. Ambulatory Treatment of Small Hyphemas (poster), American Academy of Ophthalmology, Vol. 1 M. Sunalp, P. Urea, K. Wright - November 1983

04. Inhibition of Angigenesis by a Cartilage Extract in Corneal Thermal Burns (abstract), ARVO Meeting, M. Sunalp, P. Novak, N. Sorgente - 1984

05. Pressure Effect of Tie-Over Dressing in Skin Grafts, by M. Sunalp - 1984

06. Effects of Cytotoxic Drugs on Proliferative Vitreoretinopathy in the Rabbit Cell Injection Model. Current Eye Research, Vol. 3, No. 4, Murad A. Sunalp, N. Sorgente, S.R. Ryan - 1984

07. Effect of Andriamycin on Experimental Proliferative Vitreoretinopathy in the Rabbit. Experimental Eye Research, 41, 105-115, M. Sunalp, P. Wiedeman, N. Sorgente, S.R. Ryan - 1985

08. 240 Band Modification with Scleral Buckle in Retinal Detachment, M. Sunalp - 1985

09. Inhibition of Angiogenesis on Rabbit transplant Model (abstract) ARVO meeting, M. Sunalp, P. Novak, N. Sorgente - 1985

10. Small Incision Cataract Surgery Lecture, Istanbul University, guest speaker, M. Sunalp - September 1986

11. Bed Rest versus Activity at Liberty in the Treatment of Small Hyphemas, Annals of Ophthalmology, M. Sunalp, MD, K. W. Wright, MD, P. Urrea, MD. - April 1988

12. Medical Ophthalmology Mission to the Azores with the Tulare-Angra Sister City Foundation, to perform for the first time on the island of Terceira in Portugal, cataract with implant surgery, M. Sunalp - June 1989

13. European Intraocular Lens Society Congress, Zurich, Switzerland: Surgical cataract video presentation of phacoemulsification to International Ophthalmologists, M. Sunalp, August - September 1989

14. Turkish National Ophthalmology Meeting: Poster presentation on the ophthalmology mission to the Azores and lecture presentation on phacoemulsification, surface modified lenses and implantation, Adana, Turkey, M. Sunalp - September 1989

15. Turkish-American Ophthalmology Meeting, Istanbul, Turkey - June 1990
Lectures given by M. Sunalp:
    1. Melanoma and Laser Treatment
    2. Tumor Neovascularization
    3. Phaco IOL Cataract Extraction Lecture, slides and video

16. European Implant Society International Congress, M. Sunalp, Dublin, Ireland - September 1990
Lectures given by M. Sunalp:
    1. Decentration Study of 5x6mm PMMA IOL's
    2. Comparison of Foldable/PMMA IOL's, Astigmatism
    3. Two Rare Cases of Hypotony
    4. Video (PHACO) Library and Competition

17. Oval in Oval Concept in 5x6mm Small Incision IOL and Oval Capsulorhexis™, Video for Dublin. Video presentation by M. Sunalp - August 1990

18. Punctal Plug Invention, Dr. Sunalp, Dr. Tajiri - September, 1989, (Patent pending)

19. Contact Lens and Scuba Diving Research - 1989 - 1990

20. Milroy's Disease, Authors - Dr. Kenneth Wright, Dr. Sunalp - 1990 (et. AL., pending.)

21. "Use of Oval Capsulorhexis, IOL Recommended." Dublin, Ireland. Ophthalmology Times, Vol.15, No.21, November 1990, Murad A. Sunalp, MD

22. "Small Incision, single suture favored for reducing decentration." Ophthalmology Times, Vol.16, No. 17, September 1991, Murad A. Sunalp, MD

23. Turkish National Ophthalmology Meeting, Istanbul, M. Sunalp - September 1991

24. European Implant Society, Valencia, Spain - September 1991
Lectures given by M. Sunalp:
    1. Preoperative sedation in cataract surgery
    2. No suture phacoemulsification versus one suture phacoemulsification
Video presentation:
    1. No suture, Oval in Oval, Phacoemulsification

25. Guest Lecturer, Istanbul University, M. Sunalp, January 3, 1992

26. American Society of Cataract & Refractive Surgery, San Diego, California - April 1992
Video Presentation by M. Sunalp:
    1. No Suture, Oval in Oval, Phacoemulsification

27. College of Ophthalmologists, London, England - May 1992
Video Presentation by M. Sunalp:
    1. No Suture, Oval in Oval, Phacoemulsification

28. "Put a Twist on Oval Capsulorhexis," Phaco & Foldable, Vol. 5, No. 3, Murad A. Sunalp, MD - May-June 1992

29. "Oval in oval, Sutureless cataract surgery with oval capsulotomy." Ocular Surgery News, Vol. 10, No. 12, June 15, 1992, Murad A. Sunalp, MD

30. "Diode Matters." Keeler Newsletter for Microlaser Users, Vol. 1 No. 2, August 1992, Murad A. Sunalp, MD

31. Congress of the European Society of Cataract & Refractive Surgery (Formerly the European IOL Implant Council), Paris, France - September 1992
Lectures given by M. Sunalp:
    1. Small incision phacoemulsification with topical anesthesia
    2. Astigmatic comparison analysis of one suture VS. no suture phacoemulsification cataract surgery
Video presentation:
    1. No Injection, No Suture, Yes Phacoemulsification, Yes Small Incision, Yes Modified Oval Capsulorhexis

32. Congress of the European Society of Cataract & Refractive Surgery, Innsbruck, Austria - September 1993
Video Presentation by M. Sunalp:
    1. Sunalp Phacoemulsification Spatula

33. International Winter Ophthalmic Conference (IWOC) Teton Village, Wyoming - January 1994
Presented by Murad A. Sunalp, MD, Thomas Nagy, O.D., Gary Smith, O.D.
Lecture given:
    1. Radial Keratotomy (RK) VS. VISX Excimer Laser

34. "Congenital cataracts and iris coloboma rehabilitation with phaco cataract surgery, Argon laser iridioplasty and colored contact lenses." Ocular Surgery News (International Edition) Vol. 5, No. 5, May 1994, Murad A. Sunalp, MD

35. International Winter Ophthalmic Conference (IWOC), Aspen, Colorado - February 1995
Lecture given by M. Sunalp:
    1. Advances in Refractive Surgery

36. EYETECH '95, New Orleans, Louisiana - June 1995
Lecture given by M. Sunalp:
    1. Various Types of Refractive Surgery

37. EYETECH '95, New Orleans, Louisiana - June 1995
Lecture given by M. Sunalp:
    1. Radial Keratotomy Wet Lab

38. AAO/TAOS, Chicago, Illinois - October 1996
Lecture given by M. Sunalp:
    1. Vein Occlusions and Bee Venom

39. Refractive Surgery, Latin America, Colombia - November 1996
Lecture given by M. Sunalp:
    1. Correction of pseudophakic myopia with RK/AK

40. Hawaiian Eye - January 1997
Lecture given by M. Sunalp:
    1. Correction of pseudophakic myopia with RK/AK

41. ASCRS, Mastel Conference, Washington, D.C. - June 1997
Lecture given by M. Sunalp:
    1. Correction of pseudophakic myopia with RK/AK

42. ESCRS Prague - September 1997
Lecture given by M. Sunalp:
    1. Correction of pseudophakic myopia with RK/AK and simultaneous bilateral cataract extraction under general anesthesia

43. International Turkish Ophthalmology meeting, Istanbul - September 1997
Lecture given by M. Sunalp:
    1. Simultaneous bilateral cataract extraction under general anesthesia

44. AAO San Francisco, California - October 1997
Lecture given by M. Sunalp:
    1. Simultaneous bilateral cataract extraction under general anesthesia

45. Control of Post Cataract Surgery Pressure Spikes With Tolbutamide Drops, Clinical Study with M. Sunalp, N. Sorgente - 1998

46. Post Radial Keratotomy Cataract Surgery – Intra-operative Retinoscopy and IOL insertion, World Ophthalmology Congress, Amsterdam, Netherlands – June 1999
Lecture given by M. Sunalp

47. "Use of Intraoperative Refractive Refinement with Piggyback IOL for difficult Cataract cases." Ocular Surgery News, Vol. 17, No. 19 , October 1, 1999, Murad A. Sunalp, MD

48. First Ophthalmic International Meeting, Lisbon, Portugal - September 24-25, 1999, Azores, Portugal - October 1, 1999
Lectures given by M. Sunalp:
    1. Phacoemulsification
    2. Intra Operative Refraction
    3. Live Cataract Surgery

49. General Hospital, Cabo San Jose, Mexico - February 29, 2000
Lecture given by M. Sunalp:
    1. Dry Eyes and Glaucoma Surgery

50. ASCRS, Boston International Meeting, Film Library, Boston, Massachusetts, M. Sunalp - May 20-24, 2000

51. Doheny Eye Institute, University of Southern California, June 2000
Lecture given by M. Sunalp:
    1. Temporary IOL Insertion for difficult Post Refractive Cataract cases

52. International Cataract Symposium, Lisbon, Portugal, September 2000. Panel member

53. ASCRS San Francisco, California, Lecture / Video on Refractive Surgery, M. Sunalp - April 2003

54. AAO/TAOS Symposium Anaheim, California, "Lasik and Retinal Detachment," M. Sunalp - November 2003

55. Chinese Cultural Center Visalia, California, "Surgical Correction of Presbyopia," M. Sunalp - May 19, 2004

56. Black Sea Ophthalmology meeting, "CK vs. Lasik for treating Presbyopia and Hyperopia," M. Sunalp - August 2005

57. ASCRS / AAO Istanbul, "CK, benefits and problems", Refractive surgery lecture, M. Sunalp - May 2006

58. Doheny Eye Institute / USC, "Very high hyperopia treated with Phaco, Piggyback IOL's, and Lasik," M. Sunalp - June 2006

59. Doheny Eye Institute / USC, Alumni Meeting, "Toxic Anterior Segment Syndrome (TASS) caused by Trypan Blue: First two cases presented in the world," M. Sunalp - June 2007

60. ASCRS New Orleans, Louisiana, Intraocular surgery and Trypan blue and (TASS) – Featured in Eye Word Today (Best paper of the session), M. Sunalp - April 2008

61. International Patent on Temporary Intraoperative Refractive IOL for Cataract Surgery - April 2008

62. The American Optometric Association on Intraoperative Floppy Iris Syndrome (IFIS) and Malyugin ring, Visalia, California – April 2009
Lecture given by M. Sunalp

63. Advanced Cataract Surgery and Comanagement with Multifocal IOL's, Visalia, California - October 1, 2009
Lecture given by M. Sunalp

48. First Ophthalmic International Meeting, Lisbon, Portugal - September 24-25, 1999, Azores, Portugal - October 1, 1999
Lectures given by M. Sunalp:
1. Phacoemulsification
2. Intra Operative Refraction
3. Live Cataract Surgery

49. General Hospital, Cabo San Jose, Mexico - February 29, 2000
Lecture given by M. Sunalp:
1. Dry Eyes and Glaucoma Surgery

50. ASCRS, Boston International Meeting, Film Library, Boston, Massachusetts, M. Sunalp - May 20-24, 2000

51. Doheny Eye Institute, University of Southern California, June 2000
Lecture given by M. Sunalp:
1. Temporary IOL Insertion for difficult Post Refractive Cataract cases

52. International Cataract Symposium, Lisbon, Portugal, September 2000. Panel member

53. ASCRS San Francisco, California, Lecture / Video on Refractive Surgery, M. Sunalp - April 2003

54. AAO/TAOS Symposium Anaheim, California, "Lasik and Retinal Detachment," M. Sunalp - November 2003

55. Chinese Cultural Center Visalia, California, "Surgical Correction of Presbyopia," M. Sunalp - May 19, 2004

56. Black Sea Ophthalmology meeting, "CK vs. Lasik for treating Presbyopia and Hyperopia," M. Sunalp - August 2005

57. ASCRS / AAO Istanbul, "CK, benefits and problems", Refractive surgery lecture, M. Sunalp - May 2006

58. Doheny Eye Institute / USC, "Very high hyperopia treated with Phaco, Piggyback IOL's, and Lasik," M. Sunalp - June 2006

59. Doheny Eye Institute / USC, Alumni Meeting, "Toxic Anterior Segment Syndrome (TASS) caused by Trypan blue: First two cases presented in the world," M. Sunalp - June 2007

60. ASCRS New Orleans, Louisiana, Intraocular surgery and Trypan blue and (TASS) – Featured in Eye Word Today (Best paper of the session), M. Sunalp – April 2008

61. International Patent on Temporary Intraoperative Refractive IOL for Cataract Surgery - April 2008

62. The American Optometric Association on Intraoperative Floppy Iris Syndrome (IFIS) and Malyugin ring, Visalia, California – April 2009
Lecture given by M. Sunalp

63. Advanced Cataract Surgery and Co management with Multifocal IOL's, Visalia, California - October 1, 2009
Lecture given by M. Sunalp

64. Publication Journal of Cataract & Refractive Surgery - December 2010 Volume 36 Number 12 "Two cases of Toxic anterior segment syndrome from generic trypan blue"

65. ASCRS San Diego, California Universal Corneal Marker Presentation - March 26, 2011
Lecture given by M. Sunalp

66. ASCRS San Diego, California Technique for Injecting Bevacizumab for Diabetic and Other Macular Edema Treatment – March 26, 2011 – Lecture given by M. Sunalp

67. 42nd Annual Doheny Days Conference, Universal Refractive Corneal Marker – June 11, 2011 – Lecture given Dr. Sunalp

68. 20th anniversary of LASIK and the 10th Aegean Cornea Meeting, Aegean Cornea X July 9-11

STATE BOARD OF OPTOMETRY
2450 DEL PASO ROAD, SUITE 105, SACRAMENTO, CA 95834
P (916) 575-7170 F (916) 575-7292 www.optometry .ca.gov

Continuing Education Course
Approval Checklist

Title: Glaucoma iStent Procedure
Provider Name: Dr. Murad Sunalp, MD

☒Completed Application
Open to all optometrists? ☒Yes ☐No
Maintain record agreement? ☒Yes ☐No
☒Detailed Course Description
☐PowerPoint and/or other presentation materials
☒Advertising (optional)
☒CV for EACH course instructor
☒License Verification for each course instructor
Disciplinary History? ☐Yes ☒No

Cashiering and Board Use Only			
Receipt #	Payor ID	Beneficiary ID	Amount
1-1225	6646023	349933	$0

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GOVERNOR EDMUND G. BROWN JR.

OPTOMETRY

STATE BOARD OF OPTOMETRY
2450 DEL PASO ROAD, SUITE 105, SACRAMENTO, CA 95834
P (916) 575-7170 F (916) 575-7292 www.optometry.ca.gov

CONTINUING EDUCATION COURSE APPROVAL APPLICATION

$50 Mandatory

Pursuant to California Code of Regulations (CCR) § 1536, the Board will approve continuing education (CE) courses after receiving the applicable fee, the requested information below and it has been determined that the course meets criteria specified in CCR § 1536(g).

In addition to the information requested below, please attach a copy of the course schedule and topical outline of the subject matter. Applications must be submitted 45 days prior to the course presentation date.

Please type or print clearly.

Course Title	Course Presentation Date
Glaucoma iStent Procedure	06/02/2016

Course Provider Contact Information

Provider Name

Murad (First) Sunalp (Last) A (Middle)

Provider Mailing Address

Street 880 E Merritt Ave #109 City Tulare State Ca Zip 93277

Provider Email Address slv@sunalplaservision.com

Will the proposed course be open to all California licensed optometrists?	☒ YES ☐ NO
Do you agree to maintain and furnish to the Board and/or attending licensee such records of course content and attendance as the Board requires, for a period of at least three years from the date of course presentation?	☒ YES ☐ NO

Course Instructor Information

Please provide the information below and attach the curriculum vitae for each instructor or lecturer involved in the course. If there are more instructors in the course, please provide the requested information on a separate sheet of paper.

Instructor Name

Murad (First) Sunalp (Last) A (Middle)

License Number A36954	License Type MD
Phone Number (559) 688-2020	Email Address slv@sunalplaservision.com

I declare under penalty of perjury under the laws of the State of California that all the information submitted on this form and on any accompanying attachments submitted is true and correct.

Signature of Course Provider — *Date* 4/21/16

Form CE-01, Rev. 2/16

OPTOMETRY

STATE BOARD OF OPTOMETRY
2450 DEL PASO ROAD, SUITE 105, SACRAMENTO, CA 95834
P (916) 575-7170 F (916) 575-7292 www.optometry.ca.gov

CONTINUING EDUCATION COURSE APPROVAL APPLICATION

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Course Title	Course Presentation Date
Glaucoma iStent Procedure	06/02/2016

Course Provider Contact Information

Provider Name

Murad (First) Sunalp (Last) A (Middle)

Provider Mailing Address

Street 880 E Merritt Ave #109 City Tulare State Ca Zip 93277

Provider Email Address slv@sunalplaservision.com

Will the proposed course be open to all California licensed optometrists?	☒ YES ☐ NO
Do you agree to maintain and furnish to the Board and/or attending licensee such records of course content and attendance as the Board requires, for a period of at least three years from the date of course presentation?	☒ YES ☐ NO

Course Instructor Information

Please provide the information below and attach the curriculum vitae for each instructor or lecturer involved in the course. If there are more instructors in the course, please provide the requested information on a separate sheet of paper.

Instructor Name

Murad (First) Sunalp (Last) A (Middle)

License Number A36954	License Type MD
Phone Number (559) 688-2020	Email Address slv@sunalplaservision.com

I declare under penalty of perjury under the laws of the State of California that all the information submitted on this form and on any accompanying attachments submitted is true and correct.

Signature of Course Provider *Date* 4/21/16

Glaucoma Course 0.5 Hours

- **NEW Glaukos Glaucoma iStents®**

The iStent® Trabecular Micro-Bypass Stent is indicated for use in conjunction with cataract surgery for the reduction of intraocular pressure (IOP) in adult patients with mild to moderate open angle glaucoma currently being treated with ocular hypotensive medication.

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The Valley's Eye Experts
880 E. Merritt Avenue, Ste. 109
Tulare, California 93274-2200
Offices in Bakersfield, Tulare and Visalia

MURAD A. SUNALP, M.D. (OXFORD), M.B.A., F.A.C.S.
BOARD-CERTIFIED OPHTHALMOLOGY
REFRACTIVE FELLOWSHIP
Ph: (559) 688-2020
Fax: (559) 688-8526
Cell: (310) 948-3937
Email: slv@sunalplaservision.com
Web: www.sunalplaservision.com

4/21/16

Dear XXXXXX,

We would like to cordially invite you to the Sunalp Laser Vision CE Lecture, Spring 2016!

In appreciation for our mutual hard work, and care of patients in the San Juaquin Valley, we would be honored to have you join us in an evening of food, drink, networking, and education! As we each strive to provide the highest level of care in our individual practices, it is important that we not only work together, but make a concerted effort to offer the most comprehensive and up-to-date procedures available. The SLV lecture will provide a positive environment for professional interaction, as well as a stimulating evening of industry education.

As you are probably aware, Sunalp Laser Vision has been providing eye care in Tulare and the surrounding area for over 32 years. Our Tulare facility was remodeled for our use in 2006, and our Visalia location recently opened. In addition to our two permanent facilities, we have auxiliary offices in Porterville and Bakersfield for the added convenience of your patients.

Dr. Murad A. Sunalp's specialized training has given the community access to ophthalmic laser surgery using VISX and LASIK Excimer Laser systems, up-to-the minute cataract management using multifocal and toric intraocular lens implants; and glaucoma and diabetic eye care. Dr. Sunalp has not only been able to demonstrate the highest caliber of surgical expertise, but has continued to help lead the field in innovations.

We are also proud to introduce the newest addition to our team, Dr. Manpreet Rehal, a Central Valley native. After completing her undergraduate studies at CSU Stanislaus, Dr. Rehal continued to the Illinois College of Optometry. While very skilled in the optometric field, she also contributes to our surgical staff, specializing in the co-management care of LASIK, PRK, cataract, pterygium, and blepharoplasty patients.

TOPICS WILL INCLUDE:

- **NEW Endolaser for Symptomatic Vitreous Floaters**
- **NEW Sunalp ReSure Sealant Technique™**
- **Preloaded HOYA Lens for Standard Cataract Procedures**
- **NEW Multifocal and Toric Intraocular Lens Correction**
- **Co-Management Cataract and LASIK Surgery**
- **NEW Sunalp Protocol™ Avastin Injections**
- **NEW Glaucoma iStents**
- **NEW SmartDrop™ Technology**

WHERE: **"The Vintage Press," 216 N Willis St, Visalia Ca 93291**
WHEN: **Thursday, June 1st, 6 – 9:00 P.M.**
RSVP: **(559) 688-2020 ***By Friday May 13th**

We look forward to seeing you there!!!!

Sincerely,

Murad A. Sunalp
M.D., M.B.A., FACS

Manpreet Rehal
O.D.

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The Valley's Eye Experts

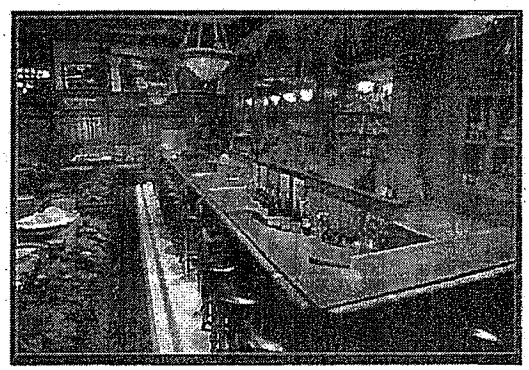
SunalpLaserVision 32 years Serving The Valley

WE WOULD LIKE TO INVITE YOU TO OUR SPRING 2016 CONTINUING EDUCATION EVENT!

When:

Thursday, June 2nd 6 – 9:30 PM

Where:



The Vintage Press, Visalia

Topics:

- NEW Endolaser for Symptomatic Vitreous Floaters
- NEW Sunalp ReSure Sealant Technique™
- Preloaded HOYA Lens for Standard Cataract Procedures
- NEW Multifocal and Toric Intraocular Lens Correction
- Co-Management Cataract and LASIK Surgery
- NEW Sunalp Protocal™ Avastin Injections
- NEW Glaucoma iStents

RSVP: 559-688-2020

EAT, NETWORK, LEARN, AND ENJOY!!!!

Murad A. Sunalp,

M.D., M.B.A., M.A., B.M., B.Ch., FACS

Sunalp Laser Vision • 880 East Merritt Avenue • Tulare, CA 93274
(800) 367-3363 • (559) 688-2020 • sunalp@aol.com

OBJECTIVE

Seeking professional opportunities in Ophthalmic surgical applications and senior healthcare administration

SKILLS

- Four years experience during post-doctoral fellowship and residency at the Estelle Doheny Eye Institute
- Nearly thirty years experience in private practice surgical Ophthalmology
- Highly skilled in the use of laser-based surgical and optical imaging equipment
- Conducted research on improving Ophthalmic surgical instrumentation
- Fluent in Turkish, English, German

EDUCATION

Oxford University
St. John's College
Oxford, England
October 1972 - July 1978

Oxford University Medical School
John Radcliffe Hospital
Headington, England
July 1978 - June 1980

Stanford University School of Medicine
Department of Ophthalmology
Stanford, California
Summer 1977 & Summer 1981

University of Southern California
Department of Ophthalmology
Doheny Eye Institute
Los Angeles, California
July 1980 - July 1985

University of California - Los Angeles
Anderson School of Business M.B.A.
Los Angeles, California
July 2003 - January 2005

University of Tennessee
College of Business Administration Physican Executive M.B.A.
Knoxville, Tennessee
January 2012 - December 2012

PROFESSIONAL EXPERIENCE

Internship

University of Southern California
Department of Ophthalmology
Los Angeles, California
June 1980 - June 1981

Fellowship

Estelle Doheny Eye Foundation
Retina Research
Los Angeles, California
July 1981 - June 1982

Residency

University of Southern California
Department of Ophthalmology
Doheny Eye Institute
Los Angeles, California
July 1982 - June 1985

Private Practice

Sunalp Laser Vision
880 East Merritt Avenue
Suite 109
Tulare, California
November 1985 - Present

ASSOCIATIONS/MEMBERSHIPS

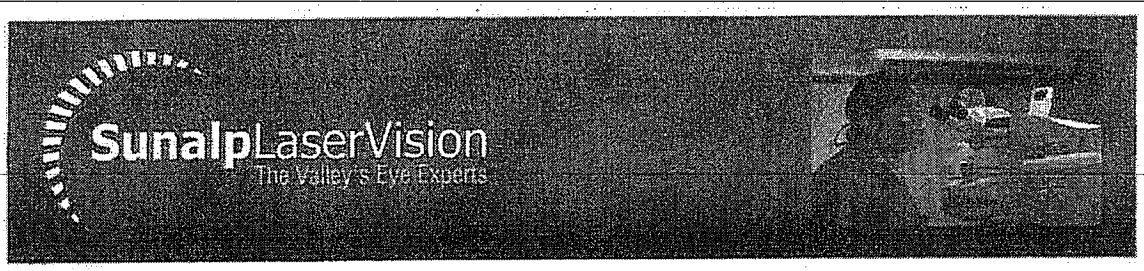
Fellow, American Academy of Ophthalmology (AAO)
Fellow American College of Surgeons
Member, Royal College of Physicians - England
Member, Royal College of Surgeons - England
Member, California Association of Ophthalmology
Fellow, Royal College of Ophthalmologists - England (FRCO)
Clinical Professor of Ophthalmology - U.C. Berkeley School of Optometry
Member, American Society of Cataract & Refractive Surgery (ASCRS)
Staff Member, Tulare Regional Medical Center - Tulare, CA
Staff Member, Sierra View District Hospital - Porterville, CA
Staff Member, Hanford Community Medical Center - Hanford, CA

LICENSES:

California, 1980
Turkey, 1989
United Kingdom, 1978
Hawaii, 2014
Florida, 2015

RESEARCH

- IOL/Phaco
- Avastin injections
- Scuba Contact Lens
- Refractive Surgery
- Tass syndrome
- Ophthalmic Instruments



Murad A. Sunalp, M.D., B.M., B. Ch.
M.D., M.A. (Oxford) F.A.A.O (USC)
FRCOphth (UK)
F.R.C.S., L.R.C.P. (London)

Sequoia Eye Center Medical Clinic / Sunalp Laser Vision / Sunalp Vision Center /
Oxford NuVision Laser Medical Center
880 East Merritt Avenue • Tulare, California 93274
(800) 367-3363 • (559) 688-2020 • www.SunalpLaserVision.com

EXPERTISE

Ophthalmology, with special interest in ophthalmic lasers, state-of-the-art cataract surgery with multifocal and toric intraocular lenses, VISX LASIK Excimer Laser with CustomVue, and glaucoma surgery

EDUCATION

Oakham Private Boarding School
Rutland, United Kingdom
September 1969 – July 1971

St. John's College, Medical School
Oxford University, England
October 1972 – July 1978

Oxford University Medical School
John Radcliffe Hospital
Headington, England
July 1978 – June 1980

Stanford University School of Medicine
Department of Ophthalmology
Stanford, California
Summer 1977 & Summer 1981

University of Southern California
Department of Ophthalmology / Doheny Eye Institute
Los Angeles, California
July 1980 – July 1985

U.C.L.A. Anderson School of Business M.B.A.
Los Angeles, California
July 2003 – Pending

DEGREES & DIPLOMAS

B.A. Honors, Physiology (Oxford) • July 1975

M.A. (Oxford) • July 1975

B.M., B. Ch. (Oxford) • July 1978

L.R.C.P. (London), M.R.C.S. (England), (M.D.) • July 1978

E.C.F.M.G. • July 1978

V.Q.E. • September 1979

F.L.E.X. • 1981

Fellow of the American Academy of Ophthalmology, FAAO • 1986

Fellow of the Royal College of Ophthalmology, England, FRCO • 1990

LANGUAGES

Turkish, English, German, Spanish

HONORS

American Field Service Scholarship of U.S.A. • 1969

O.P.O.S. Scholarship for U.K. • 1969

MEDICAL LICENSES

England U.K. – B.M. B. Ch. • 1978

California, U.S.A. – M.D. • 1981

Board Certified – American Board of Ophthalmology – F.A.O.O. • May 19, 1988

Board Certified in Ophthalmology, Turkey • 1989

Fellow of the Royal College of Ophthalmologists, United Kingdom – FRCO • 1990

ECFMG 302-986-5

POST-QUALIFICATION APPOINTMENTS

HOUSE SURGEON:	Mr. J.I.M. Hadfield, F.R.C.S., F.R.C.S.E. Regional Advisor to Royal College of Surgeons, Bedford General Hospital August 1978 – January 1979
HOUSE PHYSICIAN:	Dr. S.C. Truelove, M.D., F.R.C.P. May Reader in Clinical Medicine, and Drs. C.W. Burke and R.C. Turner The Radcliffe Infirmary, Oxford February 1979 – July 1979
ANATOMY INSTRUCTOR AND TUTOR:	Professor C.B. Phillips, F.R.C.P. Oxford University, Department of Anatomy August 1979 – January 1980
SENIOR HOUSE OFFICER:	Professor R.B. Duthie, F.R.C.S., F.R.C.S.E., Ch.M., R.A.C.S., Nuffield Professor of Orthopedic Surgery, University of Oxford February 1980 – July 1980

INTERNSHIP

University of Southern California
Department of Ophthalmology
Los Angeles, California
June 1980 – June 1981

FELLOWSHIP

Estelle Doheny Eye Foundation
Los Angeles, California
Retina Research
July 1981 – June 1982

RESIDENCY

University of Southern California
Department of Ophthalmology / Doheny Eye Institute
Los Angeles, California
July 1982 – June 1985

PROFESSIONAL EXPERIENCE

Sequoia Eye Center Medical Clinic / Sunalp Laser Vision / Sunalp Vision Center / Oxford NuVision Laser Medical Center
880 East Merritt Avenue
Tulare, California 93274
November 1985 – Present

ASSOCIATIONS

Fellow of the American Academy of Ophthalmology, FAAO

Royal College of Physicians, England

Royal College of Surgeons, England

Member of California Medical Society

California Association of Ophthalmology

Fellow of the Royal College of Ophthalmologists, England FRCO

Clinical Professor of Ophthalmology - School of Optometry, U.C. Berkeley

American Society of Cataract & Refractive Surgery, ASCRS

HOSPITAL STAFF PRIVILEGES

Tulare District Hospital, Tulare, CA

Sierra View District Hospital, Porterville, CA

Hanford Community Medical Center, Hanford, CA

CHARITY SURGERY

Azores, Portugal – 1989

Istanbul, Turkey – 1989

Istanbul, Turkey – 1992

Cabo San Jose, Mexico – 1994 - 1995

Mardin, Turkey – 1995

Istanbul, Turkey – 1997

Sarajevo, Bosnia – 1998

CHARITIES SPONSORED

CASA (Court Appointed Special Advocate) FOR CHILDREN 2008 - 2009

City of Hope 2008

Visalia Veterans Committee 2009

RESEARCH

- IOL/Phaco
- Refractive Surgery
- Dry Eyes
- Tolbutamide and Glaucoma
- Scuba Contact Lens
- Ophthalmic Instruments

SERVICES

OPHTHALMIC & REFRACTIVE CONSULTATIONS:
Corneal Topography (Nidek)
Pachymetry
OCT & HRT (Heidelberg)
IOL Master (Zeiss)
Visual Field
Fluorescein Angiography

OPHTHALMIC LASERS & PROCEDURES
Secondary Cataract YAG (Laserex)
Macular Degeneration (Argon)
Glaucoma Yag Laser (Lumenis)
Diabetic Argon Laser (HGM)
Glaucoma Surgical Implants:
- Ahmed Glaucoma Valve
- Mini Express Shunt

INFINITI OZII PHACO CATARACT
With Intraocular Lens Implant (IOL)
Multifocal Lenses:
- TECNIS Multifocal IOL
- ReSTOR Multifocal IOL
- Crystalens HD IOL
- Toric IOL
- Aspheric IOL

PLASTIC SURGERY
Blepharoplasty Upper & Lower Lids
Entropion & Ectropion Repair
Ptosis Repair
Pterygium with Autograft & Fibrin Glue
Lacrimal Surgery

REFRACTIVE SURGERY
CustomVue VISX Lasik
Photo-Refractive Keratoplasty (PRK)
Epilasik
Astigmatic Keratotomy (LRI)
Conductive Keratoplasty (CK)
Refractive Lensectomy
Implantable Contact Lenses (ICL)

PUBLICATIONS & STUDIES

01. Review of Diabetic Retinopathy and Its Treatment, Medical thesis, Oxford University, M. Sunalp - 1978

02. Improved Definition of the Appendix Mass and Appendectomy using thermocouple potential use submitted to the Department of Surgery, Oxford University, M. Sunalp - 1979

03. Ambulatory Treatment of Small Hyphemas (poster), American Academy of Ophthalmology, Vol. 1 M. Sunalp, P. Urea, K. Wright - November 1983

04. Inhibition of Angigenesis by a Cartilage Extract in Corneal Thermal Burns (abstract), ARVO Meeting, M. Sunalp, P. Novak, N. Sorgente - 1984

05. Pressure Effect of Tie-Over Dressing in Skin Grafts, by M. Sunalp - 1984

06. Effects of Cytotoxic Drugs on Proliferative Vitreoretinopathy in the Rabbit Cell Injection Model. Current Eye Research, Vol. 3, No. 4, Murad A. Sunalp, N. Sorgente, S.R. Ryan - 1984

07. Effect of Andriamycin on Experimental Proliferative Vitreoretinopathy in the Rabbit. Experimental Eye Research, 41, 105-115, M. Sunalp, P. Wiedeman, N. Sorgente, S.R. Ryan - 1985

08. 240 Band Modification with Scleral Buckle in Retinal Detachment, M. Sunalp - 1985

09. Inhibition of Angiogenesis on Rabbit transplant Model (abstract) ARVO meeting, M. Sunalp, P. Novak, N. Sorgente - 1985

10. Small Incision Cataract Surgery Lecture, Istanbul University, guest speaker, M. Sunalp - September 1986

11. Bed Rest versus Activity at Liberty in the Treatment of Small Hyphemas, Annals of Ophthalmology, M. Sunalp, MD, K. W. Wright, MD, P. Urrea, MD. - April 1988

12. Medical Ophthalmology Mission to the Azores with the Tulare-Angra Sister City Foundation, to perform for the first time on the island of Terceira in Portugal, cataract with implant surgery, M. Sunalp - June 1989

13. European Intraocular Lens Society Congress, Zurich, Switzerland: Surgical cataract video presentation of phacoemulsification to International Ophthalmologists, M. Sunalp, August - September 1989

14. Turkish National Ophthalmology Meeting: Poster presentation on the ophthalmology mission to the Azores and lecture presentation on phacoemulsification, surface modified lenses and implantation, Adana, Turkey, M. Sunalp - September 1989

15. Turkish-American Ophthalmology Meeting, Istanbul, Turkey - June 1990
    Lectures given by M. Sunalp:
    1. Melanoma and Laser Treatment
    2. Tumor Neovascularization
    3. Phaco IOL Cataract Extraction Lecture, slides and video

16. European Implant Society International Congress. M. Sunalp, Dublin, Ireland - September 1990
    Lectures given by M. Sunalp:
    1. Decentration Study of 5x6mm PMMA IOL's
    2. Comparison of Foldable/PMMA IOL's, Astigmatism
    3. Two Rare Cases of Hypotony
    4. Video (PHACO) Library and Competition

17. Oval in Oval Concept in 5x6mm Small Incision IOL and Oval Capsulorhexis™, Video for Dublin. Video presentation by M. Sunalp - August 1990

18. Punctal Plug Invention, Dr. Sunalp, Dr. Tajiri - September, 1989, (Patent pending)

19. Contact Lens and Scuba Diving Research - 1989 - 1990

20. Milroy's Disease. Authors - Dr. Kenneth Wright, Dr. Sunalp - 1990 (et. AL, pending.)

21. "Use of Oval Capsulorhexis, IOL Recommended." Dublin, Ireland. Ophthalmology Times, Vol.15. No. 21, November 1990, Murad A. Sunalp, MD

22. "Small Incision, single suture favored for reducing decentration." Ophthalmology Times, Vol.16. No. 17, September 1991, Murad A. Sunalp, MD

23. Turkish National Ophthalmology Meeting, Istanbul, M. Sunalp - September 1991

24. European Implant Society, Valencia, Spain - September 1991
Lectures given by M. Sunalp:
    1. Preoperative sedation in cataract surgery
    2. No suture phacoemulsification versus one suture phacoemulsification
Video presentation:
    1. No suture, Oval in Oval, Phacoemulsification

25. Guest Lecturer, Istanbul University, M. Sunalp, January 3, 1992

26. American Society of Cataract & Refractive Surgery, San Diego, California - April 1992
Video Presentation by M. Sunalp:
    1. No Suture, Oval in Oval, Phacoemulsification

27. College of Ophthalmologists, London, England - May 1992
Video Presentation by M. Sunalp:
    1. No Suture, Oval in Oval, Phacoemulsification

28. "Put a Twist on Oval Capsulorhexis," Phaco & Foldable, Vol. 5, No. 3, Murad A. Sunalp, MD - May-June 1992

29. "Oval in oval, Sutureless cataract surgery with oval capsulotomy." Ocular Surgery News, Vol. 10, No. 12, June 15, 1992, Murad A. Sunalp, MD

30. "Diode Matters." Keeler Newsletter for Microlaser Users, Vol. 1 No. 2, August 1992, Murad A. Sunalp, MD

31. Congress of the European Society of Cataract & Refractive Surgery (Formerly the European IOL Implant Council), Paris, France - September 1992
Lectures given by M. Sunalp:
    1. Small incision phacoemulsification with topical anesthesia
    2. Astigmatic comparison analysis of one suture VS. no suture phacoemulsification cataract surgery
Video presentation:
    1. No Injection, No Suture, Yes Phacoemulsification, Yes Small Incision, Yes Modified Oval Capsulorhexis

32. Congress of the European Society of Cataract & Refractive Surgery, Innsbruck, Austria - September 1993
Video Presentation by M. Sunalp:
    1. Sunalp Phacoemulsification Spatula

33. International Winter Ophthalmic Conference (IWOC) Teton Village, Wyoming - January 1994
Presented by Murad A. Sunalp, MD, Thomas Nagy, O.D., Gary Smith, O.D.
Lecture given:
    1. Radial Keratotomy (RK) VS. VISX Excimer Laser

34. "Congenital cataracts and iris coloboma rehabilitation with phaco cataract surgery, Argon laser iridioplasty and colored contact lenses." Ocular Surgery News (International Edition) Vol. 5, No. 5, May 1994, Murad A. Sunalp, MD

35. International Winter Ophthalmic Conference (IWOC), Aspen, Colorado - February 1995
Lecture given by M. Sunalp:
1. Advances in Refractive Surgery

36. EYETECH '95, New Orleans, Louisiana - June 1995
Lecture given by M. Sunalp:
1. Various Types of Refractive Surgery

37. EYETECH '95, New Orleans, Louisiana - June 1995
Lecture given by M. Sunalp:
1. Radial Keratotomy Wet Lab

38. AAO/TAOS, Chicago, Illinois - October 1996
Lecture given by M. Sunalp:
1. Vein Occlusions and Bee Venom

39. Refractive Surgery, Latin America, Colombia - November 1996
Lecture given by M. Sunalp:
1. Correction of pseudophakic myopia with RK/AK

40. Hawaiian Eye - January 1997
Lecture given by M. Sunalp:
1. Correction of pseudophakic myopia with RK/AK

41. ASCRS, Mastel Conference, Washington, D.C. - June 1997
Lecture given by M. Sunalp:
1. Correction of pseudophakic myopia with RK/AK

42. ESCRS Prague - September 1997
Lecture given by M. Sunalp:
1. Correction of pseudophakic myopia with RK/AK and simultaneous bilateral cataract extraction under general anesthesia

43. International Turkish Ophthalmology meeting, Istanbul - September 1997
Lecture given by M. Sunalp:
1. Simultaneous bilateral cataract extraction under general anesthesia

44. AAO San Francisco, California - October 1997
Lecture given by M. Sunalp:
1. Simultaneous bilateral cataract extraction under general anesthesia

45. Control of Post Cataract Surgery Pressure Spikes With Tolbutamide Drops, Clinical Study with M. Sunalp, N. Sorgente - 1998

46. Post Radial Keratotomy Cataract Surgery – Intra-operative Retinoscopy and IOL insertion, World Ophthalmology Congress, Amsterdam, Netherlands – June 1999
Lecture given by M. Sunalp

47. "Use of Intraoperative Refractive Refinement with Piggyback IOL for difficult Cataract cases," Ocular Surgery News, Vol. 17, No. 19 , October 1, 1999, Murad A. Sunalp, MD

48. First Ophthalmic International Meeting, Lisbon, Portugal - September 24-25, 1999, Azores, Portugal - October 1, 1999
Lectures given by M. Sunalp:
    1. Phacoemulsification
    2. Intra Operative Refraction
    3. Live Cataract Surgery

49. General Hospital, Cabo San Jose, Mexico - February 29, 2000
Lecture given by M. Sunalp:
    1. Dry Eyes and Glaucoma Surgery

50. ASCRS, Boston International Meeting, Film Library, Boston, Massachusetts, M. Sunalp - May 20-24, 2000

51. Doheny Eye Institute, University of Southern California, June 2000
Lecture given by M. Sunalp:
    1. Temporary IOL Insertion for difficult Post Refractive Cataract cases

52. International Cataract Symposium, Lisbon, Portugal, September 2000. Panel member

53. ASCRS San Francisco, California, Lecture / Video on Refractive Surgery, M. Sunalp - April 2003

54. AAO/TAOS Symposium Anaheim, California, "Lasik and Retinal Detachment," M. Sunalp - November 2003

55. Chinese Cultural Center Visalia, California, "Surgical Correction of Presbyopia," M. Sunalp - May 19, 2004

56. Black Sea Ophthalmology meeting, "CK vs. Lasik for treating Presbyopia and Hyperopia," M. Sunalp - August 2005

57. ASCRS / AAO Istanbul, "CK, benefits and problems", Refractive surgery lecture, M. Sunalp - May 2006

58. Doheny Eye Institute / USC, "Very high hyperopia treated with Phaco, Piggyback IOL's, and Lasik," M. Sunalp - June 2006

59. Doheny Eye Institute / USC, Alumni Meeting, "Toxic Anterior Segment Syndrome (TASS) caused by Trypan Blue: First two cases presented in the world," M. Sunalp - June 2007

60. ASCRS New Orleans, Louisiana, Intraocular surgery and Trypan blue and (TASS) – Featured in Eye Word Today (Best paper of the session), M. Sunalp - April 2008

61. International Patent on Temporary Intraoperative Refractive IOL for Cataract Surgery - April 2008

62. The American Optometric Association on Intraoperative Floppy Iris Syndrome (IFIS) and Malyugin ring, Visalia, California – April 2009
Lecture given by M. Sunalp

63. Advanced Cataract Surgery and Comanagement with Multifocal IOL's, Visalia, California - October 1, 2009
Lecture given by M. Sunalp

48. First Ophthalmic International Meeting, Lisbon, Portugal - September 24-25, 1999, Azores, Portugal - October 1, 1999
Lectures given by M. Sunalp:
1. Phacoemulsification
2. Intra Operative Refraction
3. Live Cataract Surgery

49. General Hospital, Cabo San Jose, Mexico - February 29, 2000
Lecture given by M. Sunalp:
1. Dry Eyes and Glaucoma Surgery

50. ASCRS, Boston International Meeting, Film Library, Boston, Massachusetts, M. Sunalp - May 20-24, 2000

51. Doheny Eye Institute, University of Southern California, June 2000
Lecture given by M. Sunalp:
1. Temporary IOL Insertion for difficult Post Refractive Cataract cases

52. International Cataract Symposium, Lisbon, Portugal, September 2000. Panel member

53. ASCRS San Francisco, California, Lecture / Video on Refractive Surgery, M. Sunalp - April 2003

54. AAO/TAOS Symposium Anaheim, California, "Lasik and Retinal Detachment," M. Sunalp - November 2003

55. Chinese Cultural Center Visalia, California, "Surgical Correction of Presbyopia," M. Sunalp – May 19, 2004

56. Black Sea Ophthalmology meeting, "CK vs. Lasik for treating Presbyopia and Hyperopia," M. Sunalp - August 2005

57. ASCRS / AAO Istanbul, "CK, benefits and problems", Refractive surgery lecture, M. Sunalp - May 2006

58. Doheny Eye Institute / USC, "Very high hyperopia treated with Phaco, Piggyback IOL's, and Lasik," M. Sunalp - June 2006

59. Doheny Eye Institute / USC, Alumni Meeting, "Toxic Anterior Segment Syndrome (TASS) caused by Trypan blue: First two cases presented in the world," M. Sunalp - June 2007

60. ASCRS New Orleans, Louisiana, Intraocular surgery and Trypan blue and (TASS) – Featured in Eye Word Today (Best paper of the session), M. Sunalp - April 2008

61. International Patent on Temporary Intraoperative Refractive IOL for Cataract Surgery - April 2008

62. The American Optometric Association on Intraoperative Floppy Iris Syndrome (IFIS) and Malyugin ring, Visalia, California – April 2009
Lecture given by M. Sunalp

63. Advanced Cataract Surgery and Co management with Multifocal IOL's, Visalia, California - October 1, 2009
Lecture given by M. Sunalp

64. Publication Journal of Cataract & Refractive Surgery - December 2010 Volume 36 Number 12 "Two cases of Toxic anterior segment syndrome from generic trypan blue"

65. ASCRS San Diego, California Universal Corneal Marker Presentation - March 26, 2011
Lecture given by M. Sunalp

66. ASCRS San Diego, California Technique for Injecting Bevacizumab for Diabetic and Other Macular Edema Treatment – March 26, 2011 – Lecture given by M. Sunalp

67. 42nd Annual Doheny Days Conference, Universal Refractive Corneal Marker – June 11, 2011 – Lecture given Dr. Sunalp

68. 20th anniversary of LASIK and the 10th Aegean Cornea Meeting, Aegean Cornea X July 9-11

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Continuing Education Course Approval Checklist

Title: Ocular Herbology
Provider Name: Dr. Tim Nguyen, OD

☒Completed Application
- Open to all optometrists? ☒Yes ☐No
- Maintain record agreement? ☒Yes ☐No

☒Detailed Course Description
☐PowerPoint and/or other presentation materials
☐Advertising (optional)
☒CV for EACH course instructor
☒License Verification for each course instructor
- Disciplinary History? ☐Yes ☒No

1-1199/6162706/3885698/50

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CONTINUING EDUCATION COURSE APPROVAL APPLICATION

$50 Mandatory

Pursuant to California Code of Regulations (CCR) § 1536, the Board will approve continuing education (CE) courses after receiving the applicable fee, the requested information below and it has been determined that the course meets criteria specified in CCR § 1536(g).

In addition to the information requested below, please attach a copy of the course schedule and topical outline of the subject matter. Applications must be submitted 45 days prior to the course presentation date.

Please type or print clearly.

Course Title	Course Presentation Date
Ocular Herbology	06/01/2016

Course Provider Contact Information

Provider Name

TIM	NGUYEN	HUNG-MINH
(First)	(Last)	(Middle)

Provider Mailing Address

Street 7841 Westerminster Blvd City Westminster State CA Zip 92683

Provider Email Address TATUPOET@GMAIL.COM

Will the proposed course be open to all California licensed optometrists?	☒ YES ☐ NO
Do you agree to maintain and furnish to the Board and/or attending licensee such records of course content and attendance as the Board requires, for a period of at least three years from the date of course presentation?	☒ YES ☐ NO

Course Instructor Information

Please provide the information below and attach the curriculum vitae for each instructor or lecturer involved in the course. If there are more instructors in the course, please provide the requested information on a separate sheet of paper.

Instructor Name

TIM	NGUYEN	HUNG-MINH
(First)	(Last)	(Middle)

License Number 12458	License Type OPTOMETRY
Phone Number (714) 200-4413	Email Address TATUPOET@GMAIL.COM

I declare under penalty of perjury under the laws of the State of California that all the information submitted on this form and on any accompanying attachments submitted is true and correct.

Signature of Course Provider — *Date* 04.12.2016

Form CE-01, Rev. 2/16

United Eye Care
Optometry

7841 Westminster Blvd Westminster, CA 92683
Tel.(714) 893-4560 *Fax: (714)487-6959*
(707) YOUR EYE *Direct: (714) 200-4413*
(968-7393) *Tatupoet@gmail.com*

United, We Care

Westminster, 04.04.2016

Dear Continuing Education Committee.

Course Tittle: **Ocular Herbology**

Course Outline:

Course teach current optometrists basic understanding about Ocular Herbology. It's the trend of significant number of patients who use ocular herbal products. Some are honestly report to their eye doctors others are hesitate due to uncertainty of their doctors opinion or knowledge about herbology. The lecture go over one to few most selective and popular herbal prescription formula related to ocular redness, inflammation, reaction, etc.
It's also aim to gain a better understanding of the ocular herb characteristics, properties, ... Therefore, optometrists can have a precaution or idea about possible drug interactions, side effects, related systemic conditions. Therefore, the lecture would support and improve the diagnostic and treatment protocol in coming time beside building a better patient care.

Course includes both theory and practical hand on observation of the herbs.

In the spirit of "*United, We Care*", I thank you.

Sincerely

Tim H. Nguyen

OD, MPH, MSAOM, CMT.

P.S.: In the Calling for the Art of Healing, I've spent several years to write this "Ocular Herbology" book and recently finish the First Edition version. I sign to the Board on my Birthday (Apr. 4th) at the time of writing this course outline as a respect and the care for both public and patients !

"The eyes are the window to the body, health & spirit
Make sure take a good care of your window"
Ta Tu

Tim H. Nguyen (aka Ta Tu)
OD, MPH, MSAOM, CMT

7841 Westminster Blvd, Westminster, CA 92683
Tel/Txt (707)**YOUR EYE** (968-7397). Direct (714)200-4413 TatuPoet@gmail.com

Curriculum Vitae

Education

Master of Acupuncture & Oriental Medicine (M.S.A.O.M.), South Baylo University	5/2012
Massage Therapy, Acupressure & Tuina Massage Program Completion	6/2012
Doctor of Optometry (O.D.), Nova Southeastern University.	5/2003
Master of Public Health (M.P.H), Nova Southeastern University.	2/2005
Bachelor of Science in Biochemistry, University of California, Los Angeles (UCLA)	1997
Associate in Art, Fullerton College.	1995

Certifications

Certified Massage Therapist.	10/2012-Present
Acupressure & Tuina Massage Therapist	6/2012-Present
Certified Optometrist, TGL	2011-Present
Therapeutic Pharmaceutical Agents and Glaucoma with Approval Dilation and Irrigation of the Punctal and Lacrimal System.	
Certified Optometrist, TPL	2003-2011
Therapeutic Pharmaceutical Agents with Approval Dilation and Irrigation of the Punctal and Lacrimal System (TPL).	
Diagnosis and Treatment of Glaucoma Course, Co-management.	2004
Certified Ortho-Keratologist	2/2010
Certified Corneal Refractive Therapist (CRT)	1/2007

Medical Research

Meditation and Intraocular Pressure Study, Principle Investigator.	7-9/2003
Gene Therapy for Diabetes, Laboratory Assistant II, UCLA School of Medicine.	1997-1998.
Muscular Dystrophy in Space in Astranaunts at MIR Station, Staff Research Associate, UCLA.	7/1997-1/1998

Scientific Invention, Works & Achievements

Tatudo Founder. The Way of Self-Healing in Martial Healthcare	2012 - Present
Discovered & coined the term "Shen Du" energy point	2014 - Present
Given additional name for an Extra Energy Point as "Spine Guard" Traditional name is "Shiqizhui."	2014 - Present
eFlow Institute	2015-Present
Patented Invention the "Equilibrium Between Economic Systems" (aka "eFlow" Patent granted by the USPTO (**Patent # 7827095)**	11/2010
Patent Application for the "eFlow" submitted. Patent Pending # 11/835,369	8/2007
Provisional Application for the "E-Flow" submitted. App. # 60/836,431	8/2006
Inventing the "E-Flow" (aka the Equilibrium Flow Between Economic Systems) A series of mathematical equations related to economic sciences.	5/2006
Conceptual Designer & Founder of the Twin Tower Health Center.	1/07-9/2010
Twin Tower Health Center Conceptual Design submitted to The President of the United States, Governor of New York and related Organizations	9/2010
Discover the Intraocular Pulse (IOP) Reading Significance.	2009-Present

A pioneer scientific method to interpret the IOP pulse reading.
Written & Derived a Physics Equation in Optic Physics. 2000
Currently inactive due to loss of all data.

Work Leadership & Experiences

United Eye Care Optometry – President	2004-present
Tatudo – Founder & President	2012-Present
eFlow – Inventor & President	2015-Present
Naturalife NLSC Ta Tu Poetry– Founder & President	2011-Present
Ta Tu Music Art & Poetry (MAP)	2015-Present
Adjunct Faculty, Biochemistry Dept., South Baylo Univ.,	2007-2009
Naturalife, LLC, President	2007-2010
Organic Chemist, Crossby Laboratory,	1998-1999
EOPS Peer Counselor, Fullerton College	1994-1995
Advanced Calculus Tutor	1993
Calculus Tutor	1991-1992

Association & Leadership

Ortho-Keratology International Consultant	2012-Present
Member of Vietnamese Professional & Business Association	2015-Present
Past President of South Baylo University Vietnamese Student Association	2011-2012
Past Member of Bowers Museum	2010 ~ 2012
Past Member of International Poet Society	2000-2010
Past Member of California & American Optometric Association	2002 ~ 2004
Past President of Vietnamese Student Association, Fullerton College	1992-1993

Award & Recognition

Award of Recognition in Music & Art by City of Westminster	11/2015
One of the Honorable Vietnamese in Poetry, Music, Art & Literature by Du Tu Le	8/2015
Honorable Ta Tu Sculpture, Bust form by UuDam Nguyen, M.F.A.	12/2012
The "eFlow" Patent (# 7827095), the United States Patent & Trademark Office	11/2010
One of the Poet of the Year 2002, International Library of Poetry	2002
Medal of Poet Merit Award, International Library of Poetry,	2002
Excellence in Calculus	1991

Publications / Lectures / Literature – Art - Music - Poetry

Tatudo Martial Healthcare. Practice twice per week. Lecture twice per month.	2012 - Present
Ocular Herbology, Author.	2013 - Present
Ta Tu Music Art & Poetry - Founder	11/2015 - Present
Ta Tu Music Presentation – Founding Lecture & Announcement	11/2015 - Present
"*Sense Body*" Single Music Album Release - Composer	11/2015– Present
eFlow lectures: The Equilibrium Flow Between Economic Systems.	2010-Present
Ortho-Keratology, Honorable International Key Guest Lecture	6/2012
Gullstrand-Emsley Schematic Eye Drawing & Art Presentation	2000 - Present
" ! ", a Zen poetic book. Author. 1st & 2nd Edition, Tri-lingual.	1999 & 2006
Tatu & the Koans: The Essence of Being, poetry cards	6/2010-2011
The Concept & Practice of Well-Being, Naturalife, LLC	2007-2010
Building the Bridge of the Vietnamese & Japanese Haiku.	9/2006
Eye Care & Cleaning, Saigon Broadcasting Television Network,	2/2005
Meditation and Intraocular Pressure. Saigon Broadcasting Television Network,	1/2005
Meditation and Intraocular Pressure, Nguoi Viet Daily Newspaper	1/2005

Meditation and Intraocular Pressure, American Academy of Optometry	6/2004
Transtheoritcal Theory & The Ten Ox-Herding Paintings in Zen, United Eye Care	12/2004
The Eye in Cosmetic & Health Care, United Eye Care Optometry	10/2004
Terrorism: A Behavioral Understanding in Transtheoritical Approach. Nova Southeastern University,	8/2002

Personal

A wife who also an OD and 2 wonderful boys !
Semi to full Vegetarian
Poet. Musician, Martial Artist, Martial Healthcare.
Tatuist.

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Continuing Education Course Approval Checklist

Title: Retinal Toxicity of Systemic Medications
Provider Name: John Lee

☒Completed Application
- Open to all optometrists? ☒Yes ☐No
- Maintain record agreement? ☒Yes ☐No

☒Detailed Course Description
☐PowerPoint and/or other presentation materials
☐Advertising (optional)
☒CV for EACH course instructor
☒License Verification for each course instructor
- Disciplinary History? ☐Yes ☒No

1-1129/5414455/4261022/200

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Please type or print clearly.

Course Title	**Course Presentation Date**
Retinal Toxicity of systemic medications	05/15/2016

Course Provider Contact Information

Provider Name

John (First) Lee (Last) H (Middle)

Provider Mailing Address

Street 2575 Yorba Linda Blvd **City** Fullerton **State** CA **Zip** 92831

Provider Email Address jlee@ketchum.edu

Will the proposed course be open to all California licensed optometrists?	☒ YES ☐ NO
Do you agree to maintain and furnish to the Board and/or attending licensee such records of course content and attendance as the Board requires, for a period of at least three years from the date of course presentation?	☒ YES ☐ NO

Course Instructor Information

Please provide the information below and attach the curriculum vitae for each instructor or lecturer involved in the course. If there are more instructors in the course, please provide the requested information on a separate sheet of paper.

Instructor Name

Rajiv (First) Rathod (Last) R (Middle)

License Number A120894	**License Type** Physician's and Surgeon's
Phone Number (714) 972-8432	**Email Address** rrathod@ocretina.net

I declare under penalty of perjury under the laws of the State of California that all the information submitted on this form and on any accompanying attachments submitted is true and correct.

Signature of Course Provider 357

4/1/2016
Date

AAOS

ASIAN AMERICAN OPTOMETRIC SOCIETY
PRESENTS

2016 May Honors Symposium

Sunday, May 15, 2016
FEATURING 5 HOURS OF CONTINUING EDUCATION

Agenda:

9:00am – 9:10am	**Welcome** Jason Lam, OD, MBA President, AAOS
9:10am – 10:50am (2 Hours CE)	**Decision Making in Glaucoma** Pinakin Davey, OD Western University of Health Sciences
10:50am – 11:10am *(20 min)*	*Break*
11:10am – 12:00pm (1 Hour CE)	**Idiopathic Orbital Inflammatory Syndrome** Munish Sharma, MD, OD Western University of Health Sciences
12:00pm – 1:00pm *(60 min)*	*Lunch*
1:00pm – 1:50pm (1 Hour CE)	**Culinary Guide to Ophthalmic Diseases** Timothy You, MD Orange County Retina
1:50pm – 2:40pm (1 Hour CE)	**Retinal Toxicity of Systemic Medications** Rajiv Rathod, MD, MBA Orange County Retina

Retinal Toxicity of Systemic Medications

RAJIV R. RATHOD, M.D., M.B.A.

1. Review medications that cause retinal toxicity
    a. Medications and indications
    b. Medications and side effects
    c. Dosage needed to cause toxicity
    d. Mechanism of action on the retina
    e. Effects of medications on the retina
2. Describe the findings and diagnostic approaches
    a. What to look for on the examination
    b. Techniques to maximize presentation of retinal toxicity
    c. Presentation of effects on the retina
3. Describe the treatments for toxicity
    a. Treatment options
    b. Reversible vs. Irreversible
    c. Alternatives to consider

Specific Medications that will be covered in-depth:

Hydroxychloroquine
Corticosteroids
Oral Contraceptives (OCPs)
Topiramate
Nicotinic acid
Glitazones
Taxol
Fingolamid
PDE-5 inhibitors
Interferon a-2

CURRICULUM VITAE

RAJIV R. RATHOD, M.D., M.B.A.

Fellow, American Academy of Ophthalmology

Office Address:
Orange County Retina Medical Group
1200 North Tustin Avenue, Suite 140
Santa Ana, California 92705
714-972-8432

PROFESSIONAL PRACTICE AFFILIATIONS

Orange County Retina Medical Group
Orange County, California
Physician/Surgeon
Since July 2012

Locations

1200 North Tustin Avenue	Suite 140	Santa Ana, CA 92705	714-972-8432
1200 North Tustin Avenue	Suite 100	Santa Ana, CA 92705	714-972-8432
23521 Paseo de Valencia	Suite 309	Laguna Hills, CA 92653	949-581-3618
320 Superior Avenue	Suite 160	Newport Beach, CA 92663	949-646-3242
333 W. Bastanchury Road	Suite 200	Fullerton, CA 92835	714-451-0801
31451 Rancho Viejo Road	Suite 101	San Juan Capistrano, CA 92675	949-496-0611

EDUCATION AND TRAINING

Vitreo-Retinal Fellowship
University of Illinois
Chicago, Illinois; 2010-2012

Residency
Chief Resident, Ophthalmology
Washington University School of Medicine
St. Louis, Missouri; 2009-2010

Ophthalmology
Washington University School of Medicine / Barnes-Jewish Hospital
St. Louis, Missouri; 2006-2009

Internship in Medicine
Santa Clara Valley Medical Center Transitional Internship
Stanford University School of Medicine
San Jose, California; 2005-2006

Medical School
Medical Doctorate
Vanderbilt University School of Medicine
Nashville, Tennessee; 2000-2005

HOSPITAL/SURGERY CENTER AFFILIATIONS

2012 – Present	Anaheim Regional Medical Center, Anaheim, California
2012 – Present	Barranca Surgery Center, Irvine, California
2012 – Present	Children's Hospital of Orange County, Orange, California
2012 – Present	Children's Hospital at Mission, Mission Viejo, California
2012 – Present	Hoag Memorial Hospital Presbyterian, Newport Beach, California
2012 – Present	Pacifica Hills Surgery Center, Laguna Hills, California
2012 – Present	St. Joseph Hospital, Orange, California
2012 – Present	St. Jude Medical Center, Fullerton, California
2012 – Present	Western Medical Center, Santa Ana, California

CLINICAL RESEARCH

Six years of experience, prior to July 2012, in conducting research in ophthalmology-related topics including endophthalmitis, vitreoretinal surgery, retinal detachment repair, and sickle cell retinopathy.

01. Lpath, Protocol LT1009-Oph-003 (NEXUS), Phase IIA, 2012-Present
    Sub-Investigator. *A multicenter, masked, randomized, comparator-controlled study evaluation Isonep™ (sonepcizumab [LT1009]) as either monotherapy or adjunctive therapy to Lucentis or Avastin versus Lucentis or Avastin alone for the treatment of subjects with choroidal neovascularization secondary to AMD.*

02. Alimera Sciences, Protocol C-01-11-008, Extension Study, 2012-Present
    Sub-Investigator. *An open-label, multicenter, extension study of the safety and utility of the new inserter of Iluvien® (Fluocinolone Acetonide Intravitreal Insert) 0.19mg and the safety of Iluvien® in subjects with DME.*

03. EyeGate Pharmaceuticals, Protocol EGP-437-004, Phase III, 2012-2013
    Sub-Investigator. *A prospective, multi-center, randomized, double-masked, positive controlled, clinical trial designed to evaluate the safety and efficacy of iontophoretic dexamethasone phosphate ophthalmic suspension (1%) in patients with non-infectious anterior segment uveitis*

04. Quark Pharmaceuticals, Protocol QRK202 (MATISSE), Phase II, 2012-Present
    Sub-Investigator. *An open-label dose escalation study of PF-04523655 (Stratum I) combined with a prospective, randomized, double-masked, multi-center, controlled study (Stratum II) evaluating the efficacy and safety of PF-04523655 alone and in combination with ranibizumab versus ranibizumab alone in diabetic macular edema*

05. Xoma, Protocol X052130/CL3-78989-005, Phase III, 2012-Present
    Sub-Investigator. *A randomized, double-masked, placebo-controlled study of the safety and efficacy of gevokizumab in the treatement of active non-infectious intermediate, posterior, or pan-uveitis*

06. Pfizer, Protocol B1181003-1050, Phase II, 2012-Present
    Sub-Investigator. *A phase 2, multi-center, randomized, double-masked, placebo-controlled, multi-dose study to investigate the efficacy, safety, pharmacokinetics and pharmacodynamics of RN6G (PF-04382923) in subjects with geographic atrophy secondary to age-related macular degeneration*

07. Xoma, Protocol X052131/CL3-78989-005 (EYEGUARD™-C), Phase III, 2012-Present
    Sub-Investigator. *A randomized, double-masked, placebo-controlled study of the safety and efficacy of gevokizumab in the treatment of subjects with non-infectious intermediate, posterior, or pan- uveitis currently controlled with systemic treatment*

04. Iontopheretic Dexamethasone Phosphate Opthalmic Suspension in Patients with Non-Infectious Anterior Segment Uveitis: Phase I/II Data. Anaheim, California; October 3, 2012

COMMUNITY INVOLVEMENT

Mobile Eye Care Clinic for the Homeless, Illumination Foundation, Saddelback Memorial Care Hospital, San Clemente, CA; November 4, 2012

LANGUAGES

Medical Spanish, Gujarati

CALIFORNIA STATE BOARD OF OPTOMETRY

STATE BOARD OF OPTOMETRY
2450 DEL PASO ROAD, SUITE 105, SACRAMENTO, CA 95834
P (916) 575-7170 F (916) 575-7292 www.optometry .ca.gov

Continuing Education Course Approval Checklist

Title: Decision Making in Glaucoma
Provider Name: John Lee

☒Completed Application
- Open to all optometrists? ☒Yes ☐No
- Maintain record agreement? ☒Yes ☐No

☐Detailed Course Description
☒PowerPoint and/or other presentation materials
☐Advertising (optional)
☒CV for EACH course instructor
☒License Verification for each course instructor
- Disciplinary History? ☐Yes ☒No

OPTOMETRY

STATE BOARD OF OPTOMETRY
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CONTINUING EDUCATION COURSE APPROVAL APPLICATION

$50 Mandatory

Pursuant to California Code of Regulations (CCR) § 1536, the Board will approve continuing education (CE) courses after receiving the applicable fee, the requested information below and it has been determined that the course meets criteria specified in CCR § 1536(g).

In addition to the information requested below, please attach a copy of the course schedule and topical outline of the subject matter. Applications must be submitted 45 days prior to the course presentation date.

Please type or print clearly.

Course Title	Course Presentation Date
Decision Making in Glaucoma	05/15/2016

Course Provider Contact Information

Provider Name

John (First) Lee (Last) H (Middle)

Provider Mailing Address

Street 2575 Yorba Linda Blvd City Fullerton State CA Zip 92831

Provider Email Address jlee@ketchum.edu

Will the proposed course be open to all California licensed optometrists?	☒ YES ☐ NO
Do you agree to maintain and furnish to the Board and/or attending licensee such records of course content and attendance as the Board requires, for a period of at least three years from the date of course presentation?	☒ YES ☐ NO

Course Instructor Information

Please provide the information below and attach the curriculum vitae for each instructor or lecturer involved in the course. If there are more instructors in the course, please provide the requested information on a separate sheet of paper.

Instructor Name

Pinakin (First) Davey (Last) Gunvant (Middle)

License Number 14334TLG	License Type Optometry
Phone Number (901) 831-1562	Email Address pdavey@westernu.edu

I declare under penalty of perjury under the laws of the State of California that all the information submitted on this form and on any accompanying attachments submitted is true and correct.

Signature of Course Provider 4/1/2016 *Date*

AAOS

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Decision Making in Open angle glaucoma

Pinakin G Davey PhD OD, FAAO

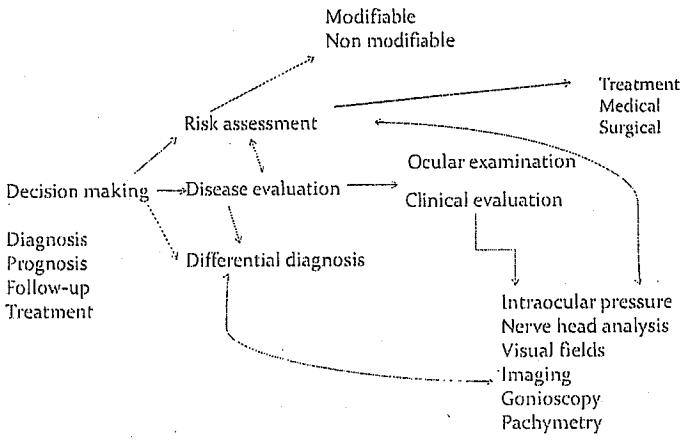
Professor and Director of Research

Western University of Health Sciences
College of Optometry

Disclosures

- Principal investigator for iVue OCT trial
- Principal investigator Topcon FDA trials for Maestro and OCT 2000
- Consultant for Topcon
- Speakers bureau Sanofi- Genzyme and Allergan

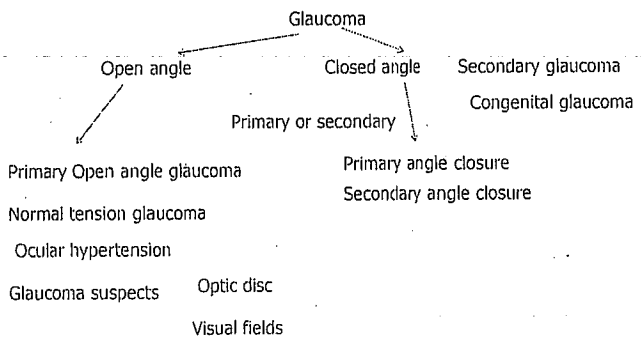
Outline



What is glaucoma?

- Definition:
  - "Ocular tissue damage at least partially related to intraocular pressure"
  - Where glaucoma is concerned agreement is limited among clinicians and scientists.

Types of glaucoma



Prevalence studies

- Prevalence in different studies varies
  - Different populations
  - Different methods used to obtain a sample
  - Definition of glaucoma

Prevalence of POAG in Caucasians

Study	Age range	Prevalence %
Roscommon	Over 50	1.9
Beaver Dam	43-84	2.1
Rotterdam	Over 55	1.1
Dalby	55-69	0.9
Blue Mountain	Over 49	2.4
Barbados Caucasians	40-84	0.8
Baltimore Caucasians	Over 40	1.3

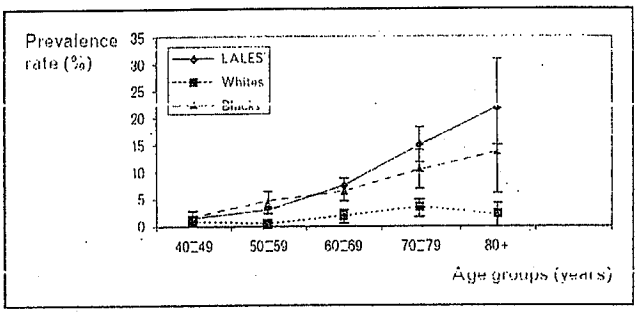
Prevalence of POAG in African American & African Caribbean

Study	Age range	Prevalence %
Barbados	40-84	7.1
Baltimore	Over 40	4.2
St Lucia	Over 30	8.8
London African-Caribbean	Over 35	3.9

Prevalence of OAG in LALES

Age group (years)	Number who received on examination	Total	
		n (%)	95% CI
40–49	2363	31 (1.32)	0.90–1.86
50–59	1853	54 (2.92)	2.18–3.80
60–69	1195	88 (7.36)	5.90–9.08
70–79	594	86 (14.72)	11.78–18.18
≥80	147	32 (21.76)	14.90–30.72
Total	6142	291 (4.74)	4.22–5.30

Figure 2 Comparison between the Los Angeles Latino Eye Study (LALES) and the Baltimore Eye Study (blacks and non-Hispanic whites) in age-specific prevalence of open-angle glaucoma



Risk factors for glaucoma examined in population based studies

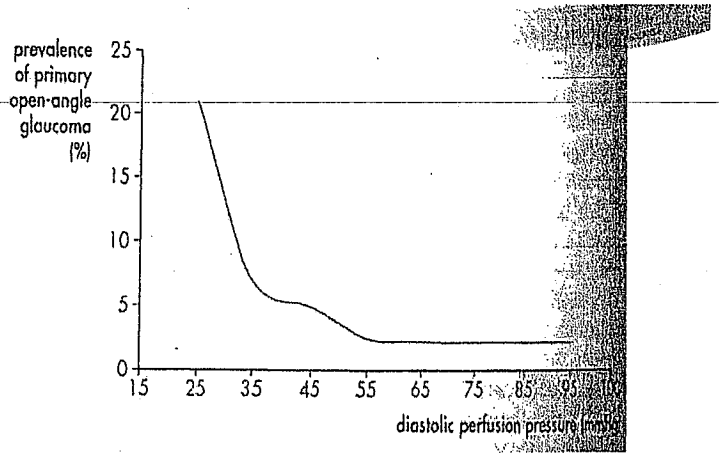
- Demographic
  - Age
  - Gender
  - Race
- Ocular
  - IOP
  - Optic nerve head
  - Myopia
  - Hypermetropia
- Systemic
  - Diabetes
  - Systemic hypertension
- Genetic
  - Family history
- Other
  - Cigarette smoking
  - Alcohol intake
  - Socio economic factors

Intraocular pressure

- Major risk factor
  - Not as fundamental as once thought.
- Prevalence increases with increase in IOP
- Visual field loss slows down with decrease in IOP
- Even if both eyes have IOP lower than 21. The eye with greater IOP will lose field quicker.

Systemic hypertension and glaucoma

- Blood pressure and pathogenesis of glaucoma
  - Hospital based study
- Baltimore Eye Survey examined perfusion pressure
- Ocular Perfusion pressure= Blood pressure-IOP (Systolic or Diastolic or mean pressure)



Tielsch et al Hypertension perfusion pressure and primary open angle glaucoma Arch ophthalmol 1995

Genetic factors

- Positive family history
- Bias:
  - + ve Family history makes a person have frequent check ups
  - Recall bias
    - Sibling with glaucoma odds ratio 3.69
    - Parents with glaucoma odds ratio 2.67
    - Children with glaucoma odds ratio 1.12

Summary

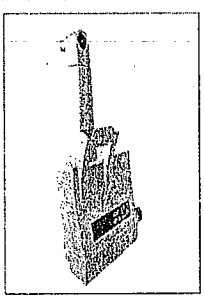
- Prevalence of POAG is Caucasians over 40 years of age 2% and in African American and African Caribbean is "four times" that.
- Hispanics greater risk than African American as they grow older
- Overall quite underdiagnosed- 50% unknown
- Glaucoma suspects- increases need for care dramatically

Intraocular pressure

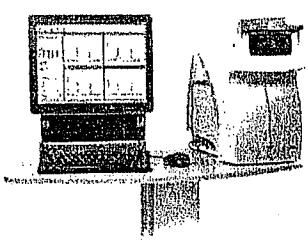
- Diagnosis- not helpful
- Treatment- only proven method
- Progression- very closely associated with IOP
- Risk factor- without a doubt most important risk factor
- In fact only alterable risk factor!

Intraocular pressure

Pascal dynamic contour tonometer



Ocular Response Analyzer



Nerve head evaluation

1. Observe the scleral ring to identify the limits of the optic disc and evaluate its size.

Measure Disc Size

Observe the scleral ring to identify the limits of the optic disc and evaluate its size.

- 66D 1 X magnification

Cup size is associated with disc size

Effects any casual observer for cup to disc ratio measurement

Rim thickness varies with disc size

Disc size

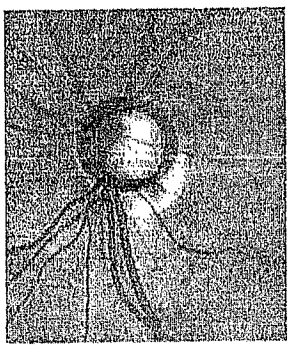
Small < 1.5 mm²

Medium > 1.5 but <2.5 mm²

Large > 2.5 mm²

Neuroretinal rim characteristics

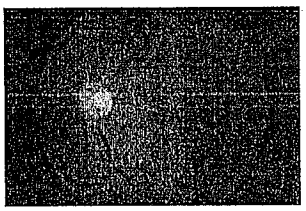
- Color of rim- pale rims not good
- Width of rim in all sectors
- ISNT rule
- ISNT rule is accurate about 70% of times



RNFL

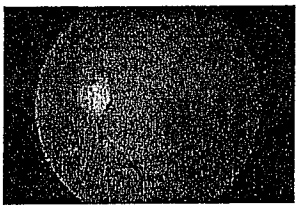
Healthy eye has striations

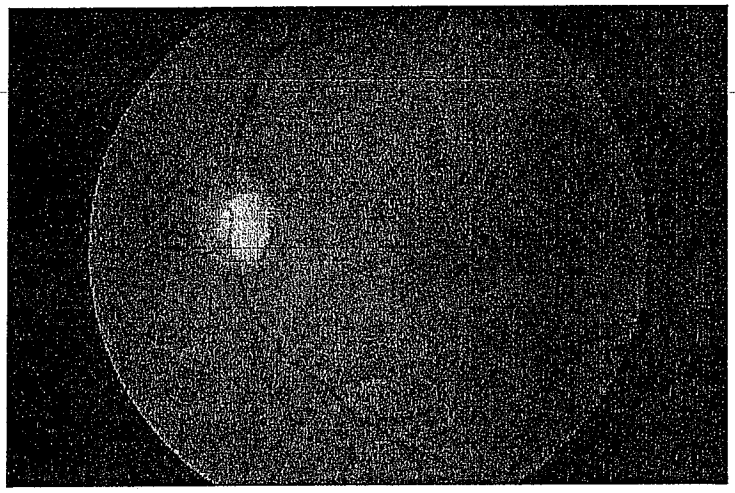
- A certain amount of NFL is required for visibility
- RNFL loss can be diffuse, localized or mixed



RNFL cont...

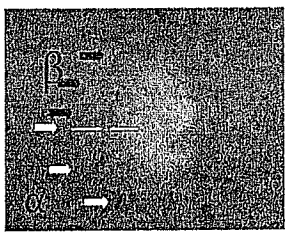
- Diffuse – reduction in RNFL brightness
- Localized – wedge shaped defect
- Localized RNFL defects should traced back the disc





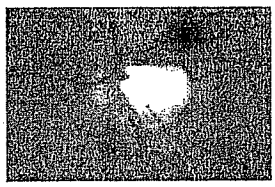
Peripapillary atrophy

- Where
- How large
- *1/8, ¼, ½, ¾, 1, >1 DD*

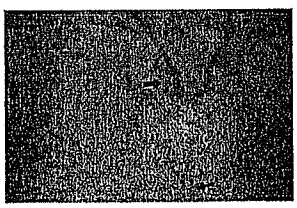


Optic disc hemorrhages

- Transient
- Inferior temporal or superior temporal regions mainly
- Record present or absent
- If present where



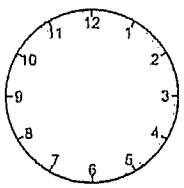
Retinal vessels



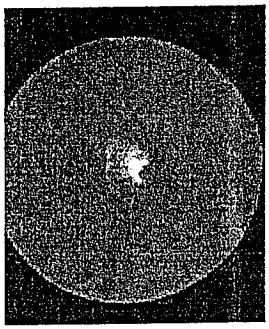
Look for this in patients that you suspect NTG

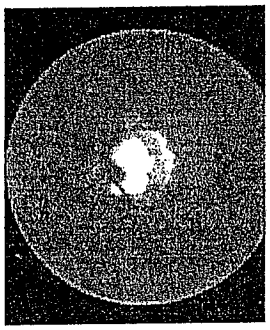
CD ratio

- Vertical
- Horizontal
- Largest
- CD ratio of imaging devices will not match your findings!

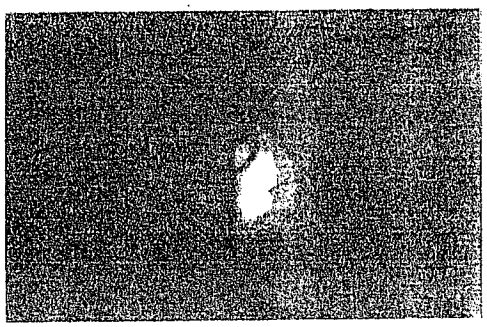


Focal atrophy of neural rim

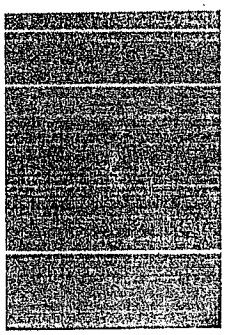


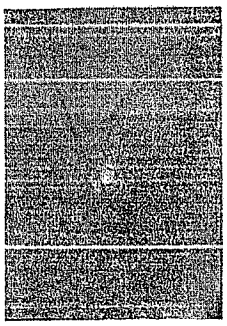


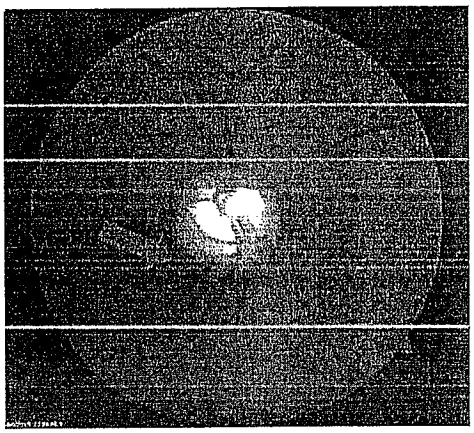
Focal atrophy of neural rim-2



Optic disc hemorrhages

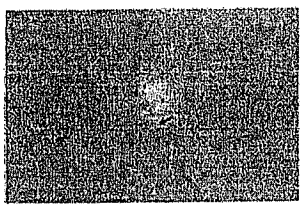


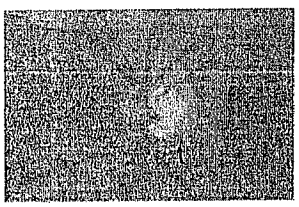




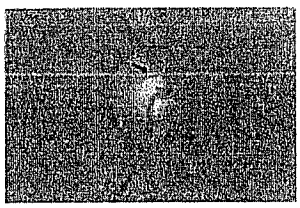
Optic disc hemorrhages-3

3 years later



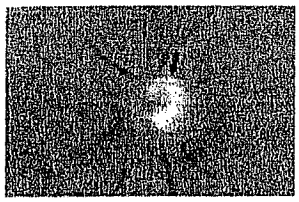


Barring of circumlinear vessels



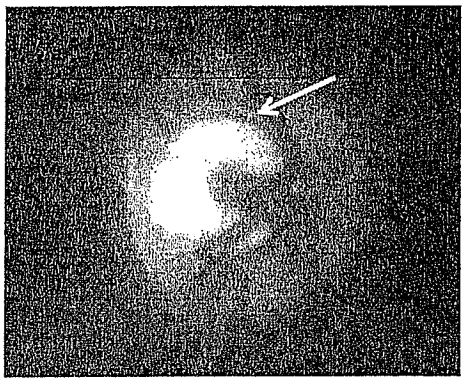
- Vessels that runs along margin between cup and neural rim.
- Found supero and infero temporally

Barring of circumlinear vessels

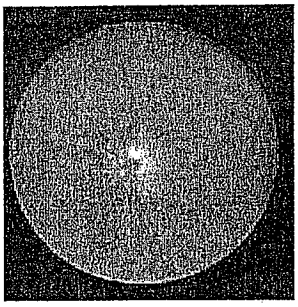


- As rim becomes thinner it leaves an area of pallor between the rim and the circumlinear blood vessel.

Barring of circumlinear vessels

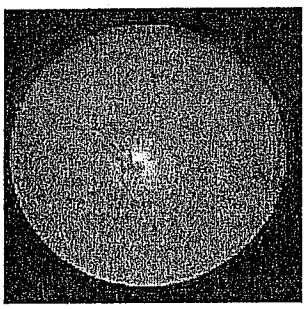


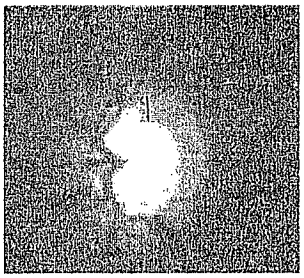
Nasal cupping



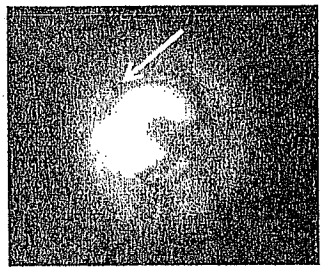
- Usually seen in advanced glaucoma.
- Space between Nasal rim and blood vessels.

Laminar dot sign



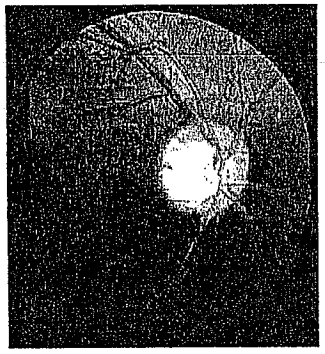


Bayonetting

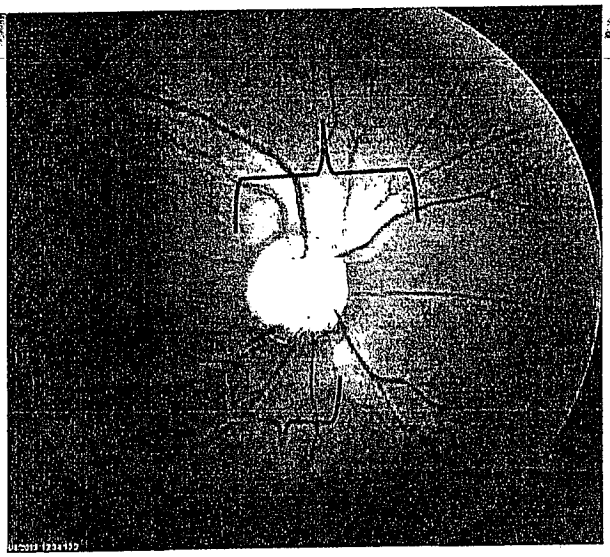


- Double angulation of blood vessel.

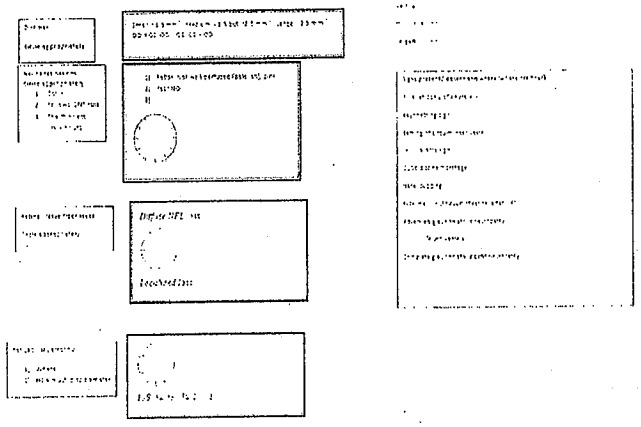
Nerve fiber bundle defect



- Rim changes also produces RNFL defects.
- Dark stripes or wedge shapes defect paralleling the normal striations.
- Common after disc hemorrhages



Lab worksheet Dr. Pinakin Davey



Visual field analysis: A systematic approach

1

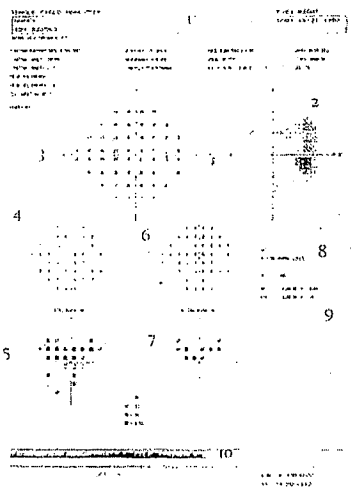
Watch out for
Pupil size
Reliability index
Type of test
24-2 SITA STD
age
refractive error

2 Grey Scale

Look for patterns
Global view
Not for diagnosis
Types of visual field defects

3 Raw data

Normals centrally low 30's
Peripherally high 20's



4 Total deviation

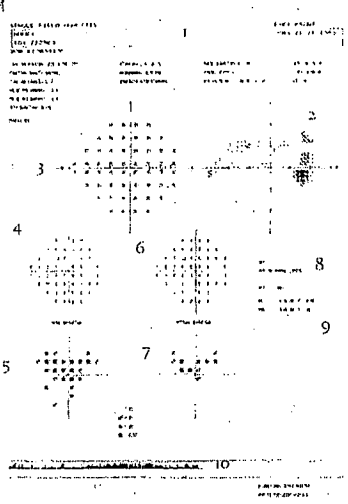
Devidation from average

5 Total deviation probability plot

6 Pattern deviation

Removes any generalized defects
Cataract
Pupil miosis

7 Pattern deviation probability plot

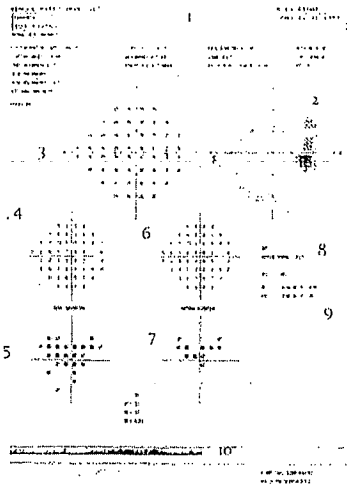


8 glaucoma hemifield test
Outside normal limits
Borderline
Generalized reduction in sensitivity

9 global indices

MD mean deviation
PSD pattern Standard Devaition

10 gaze tracking



Criteria for glaucomatous damage

- GHT outside normal limits in at least two occasions
- PSD < 5% of normal individuals
- A cluster of three or more **non-edge** points (pattern deviation plot) all of which are depressed at a p<5% and one of which is depressed at a p<1% on two occasions (respecting horizontal meridian)
- This criterion was written for 30-2, if 24-2 **field is analyzed edge points are included.**

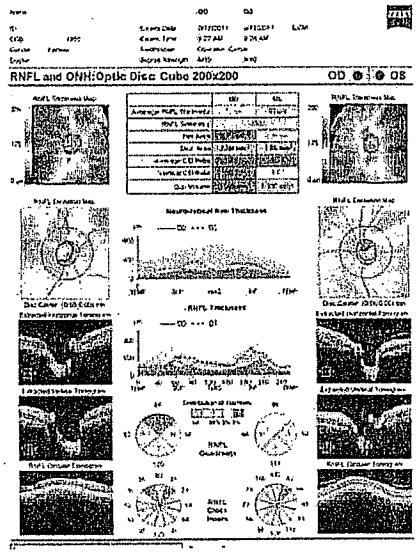
49

Staging based on MD

- Better than-6 db- Mild
- Worse than -6.0 dB but better than -12 dB – Moderate
- Worse than -12.0 dB severe

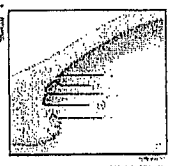
50

Optical coherence tomography



Gonioscopy

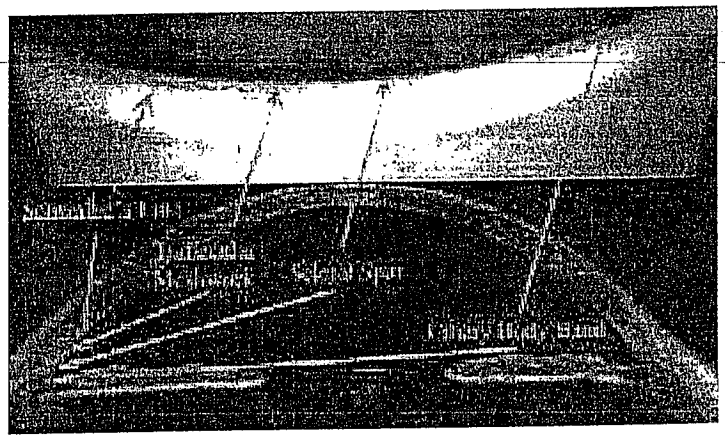
Gonioscopy



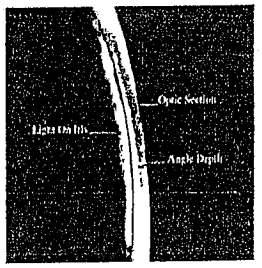
A = Above Schwalbe line, totally occluded angle.
B = Behind the Schwalbe line, peripheral iris is in contact with TM.
C = Scleral spur Iris root at the level of scleral spur
D = Deep anterior ciliary body seen.
E = extremely deep

Angle approach

Curvature of periheral iris



Van Herrick angle estimation

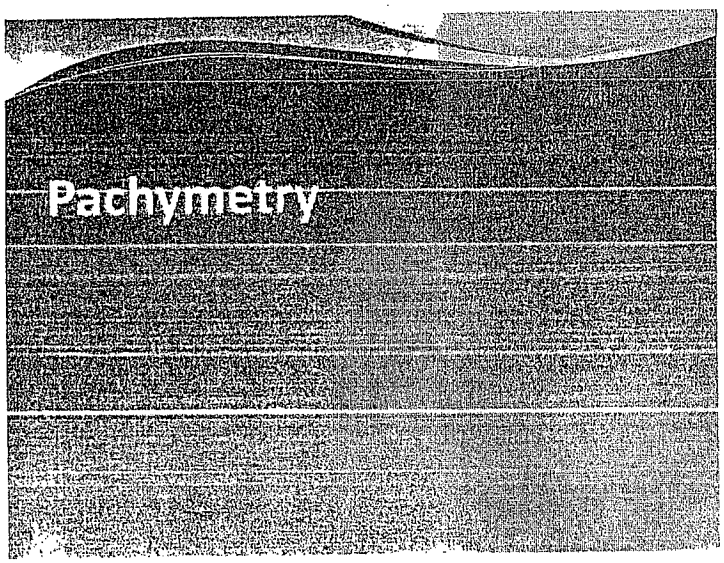


1:1 – Open angle, VH grade 4

1:1/2 – Open angle, VH grade 3

1:1/4 – Narrow angle, VH grade 2 (Angle Closure Possible)

1: <1/4 – Angle closure likely, VH grade 1



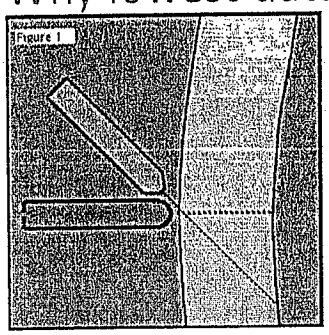
Ultrasound pachymetry is standard

As central data as possible

Greater number of measurements increase your reproducibility of data

Always use lowest data

Why lowest data?



Perpendicular measurements are lowest or smallest in value

Why not average the data?

Average 484 microns

Lowest 473 microns

Accutome Pach V
Date: Mon 03/07/2011
Time: 05:26 PM

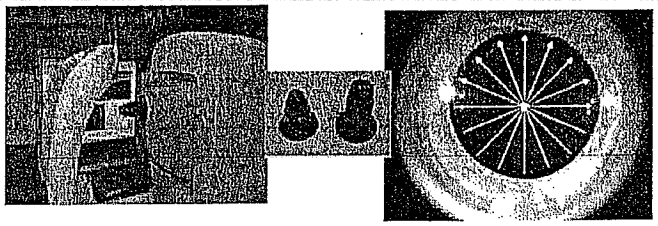
Patient's Name: _

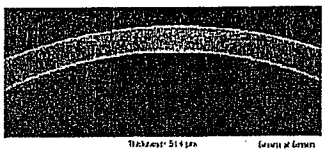
CCT Reading	OD	OS
1	480	473
2	481	481
3	478	487
4	484	473
5	483	509
6	470	488
9	0	0
Average CCT	480	484
MIOP	15	15
TIOP	18	18

Averaging helps decrease error but does not eliminate it.

A Haun, P Gunvant, M Baskaran, L Vijaya: Central corneal thickness measurement using a pachometer: Mean or lowest values? Invest Ophthalmol Vis Sci. 2004, 45: E-Abstract 137

Anterior segment OCT



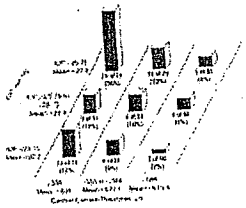


Difference between optical and ultrasound pachymetry measurments

Author	Difference in OCT and ultrasound values
Kim et al *AJO 2008*	26 microns
Wang et al *J Refract Surg 2008*	38 microns
Gunvant & Darner *Medical Imaging 2011*	13 microns

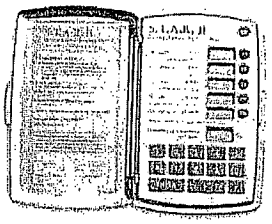
Kim, H.Y., Budenz, D.L., Lee P.S. et al., " Comparison of central corneal thickness using anterior segment optical coherence tomography vs ultrasonic pachymetry. Am J Ophthalmol. 145:228-232 (2008).
Wang, J.C., Bunce, C., and Lee, H.M., " Intraoperative corneal thickness measurement using optical coherence pachymetry and cornea-gage plus ultrasound pachymetry J Refract Surg. 24(6):600-4 (2008
P Gunvant, R Darner: Evaluation of corneal thickness measurements obtained using optical coherence tomography and ultrasound technique and determination of specificity in keratoconus screening Medical Imaging: 79661 B-B8

How to use CCT data in glaucoma management?



- Error in IOP measurements
- Ocular hypertensive patients
  - Thinner cornea at greater risk of developing glaucoma

The Scoring Tool for Assessing Risk (S.T.A.R. II) calculator



Probability of conversion in 5- years
<5% observe and monitor
5 to 15% consider treatment
>15% treat

- OHTs and EGPS data
- Intended for use only in untreated OHT patients
- Age (30-80)
- IOP 20-32 mmHg
- CCT 475 to 650 microns
- PSD 0.50 to 3.00 dB
- C/D ratio vertical 0.00 to 0.8

Medical management versus Surgical management

Medications first advantages

- Drugs are safer than surgery-
  - Less complications
  - Less discomfort
- Drug effects can reversed or is short acting
- Less expensive in the short run
- Multiple drugs can be combined to achieve successful reduction in IOP
- Better quality of life when compared to surgery first (Lichter et al., Ophthalmology 2001)

Medications first disadvantages

May be more expensive in the long run

Multiple drugs

- Compliance, adherence and persistence issues

Chronic drug uses and its effect on future surgical outcomes?

- Preservatives effect?
- Inflammation leading to failure of future procedures*

Increased chances of cataract formation

*Broadway DC et al., Adverse effects of topical antiglaucoma medications: II Arch Ophthalmol 1994

Surgery first - advantages

- If successful and large drop in IOP may be obtained
- No issues related to patient compliance, adherence and persistence

Good in situations where obtaining continuous supply of medications is a problem

May be cheaper long term

Surgery first - disadvantages

Outcomes may be variable

Long term may loose efficacy

May still require additional topical medications

Complications may be dire

Comfort and quality of life may be lower

Chances of cataract formation is greater than topical medications

Age- young vs. older individuals

Race and management options

- Race – white versus individuals with greater pigment

Individuals with greater pigment- greater risk of post-operative scarring*

- Medications –first choice

*Broadway DC et al., Racial differences in the results of glaucoma filtration surgery: are racial differences in conjunctival cell profile important? BJO 1994

Age and management options

Younger individuals

- Accelerated wound healing systems
- Thick fleshy periocular tissues heals rapidly

- Thus older individuals better suited for surgical options

Current practice patterns

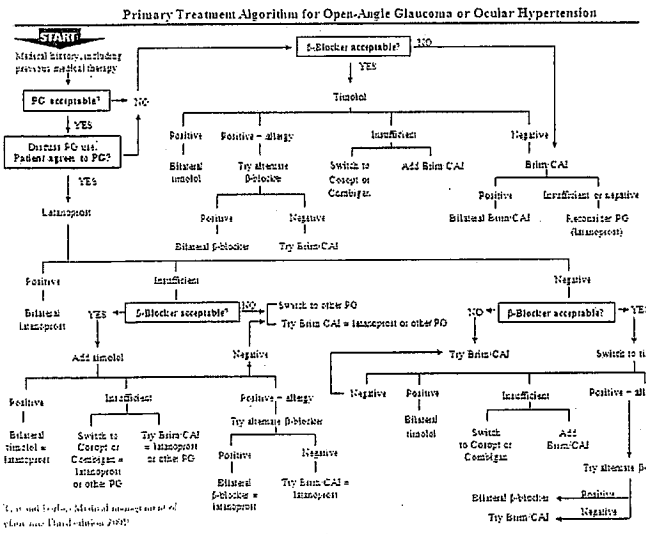
- Unacceptable high pressures will inevitably destroy optic nerve tissue
- Safe levels of IOP by any means warranted
  - If these don't work or not sufficient
  - drugs like – prostaglandins
  - reduction in inflow – beta blockers
- Maximal medical therapy

- Consider surgery

Maximal tolerated medical therapy

- *β-Blockers*
  - Timolol
  - Betaxolol
  - Levobunolol
  - Carteolol
  - Metipranolol
- *Carbonic Anhydrase Inhibitors (CAIs)*
  - Systemic:
    - Acetazolamide
    - Methazolamide
  - Topical:
    - Dorzolamide
    - Brinzolamide
- *Adrenergic Agonists*
  - *Nonspecific:*
    - Dipivefrin (epinephrine) – also increases conventional outflow
  - α_2-Agonists:
    - Brimonidine – also increases uveoscleral outflow
    - Apraclonidine – also increases uveoscleral outflow
- *Conventional/Trabecular*
  - Cholinergic agonists (parasympathomimetics):
    - Pilocarpine
    - Echothiophate iodide
    - Carbachol
  - Prostaglandin derivatives:
    - Bimatoprost
    - Latanoprost
  - Nonspecific adrenergic agonists:
    - Dipivefrin (epinephrine)
- *Nonconventional/Uveoscleral*
  - Prostaglandin derivatives:
    - Latanoprost
    - Bimatoprost
    - Travoprost
  - α_2-Agonists:
    - Brimonidine

And how exactly do I use them?



Do we really have the luxury to use them all?

- Stage of disease
  - Visual field status
- Stage of nerve damage
  - Rim tissue remaining
- Type of glaucoma
  - POAG – medical first makes sense
  - Secondary glaucoma
  - Congenital glaucoma
  - Complete angle closure

  } treated differently
- Adherence, compliance, persistence issues
- Effect of medications and future outcomes of surgery

Target pressure

- A theoretical value below which visual field and ONH appear stable (not deteriorating).
- Calculated from highest recorded IOP.
- Conventionally 20-30% decrease in IOP.
- 40% or more if severe glaucoma
- Consider having a range rather than one number.

Medications

- First line drugs- prostaglandin analogs
- Second line: Beta blockers, Alpha 2 agonist, Carbonic anhydrase inhibitor
- Third: Combination with prostaglandin
  - Eg: PGA (Travatan z) and CAI+ Beta blocker (COSOPT)
  - PGA + brinzolamide/brimonidine (Simbrinza)

Where should the IOP be?

- No real number
- Start with 30% drop
- Monitor for progression

- Advanced glaucoma you want IOP to be less than 12

- Pressure should not fluctuate much

Laser Therapy

ALT versus SLT

- SLT preferred
- Unlike ALT, SLT does not scar
- Autopsy specimens – confirm no coagulative damage after SLT
- SLT can be repeated

Mechanisms of action SLT

- 5-8 fold increase in monocytes and macrophages in TM
  - after treatment with SLT

Hypothesis

- Injury via laser causes releasing of chemoattractant
- This in turn recruits monocytes that are transformed into macrophages
- Macrophages clear pigment granules and exit via Schlemm's canal

Alvarado and Murphy Outflow obstruction in pigmentary and primary open angle glaucoma Arch Ophthalmol 1992

Selective Laser trabeculoplasty

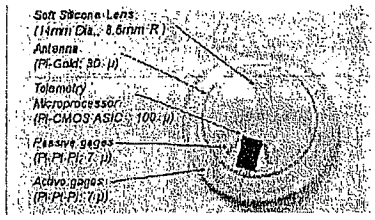
- Selectively targets melanin pigment of TM
- More safe compared to ALT (because lower power)
- Equally effective as ALT
- Can be repeated if first attempt is not effective

Advances and updates

SENSIMED

innovation in medical micro-technology

Triggerfish



Central Curvature Radius (Flat Meridian)	7.0–7.65 mm 48–44 D		7.65–8.4 mm 44–40 D	
Corneo-colorel Profile	Fluent	Marked	Fluent	Marked
Base Curve	8.4 (STEEP)	8.7 (MEDIUM)	8.7 (MEDIUM)	9.0 (FLAT)

Cost 500 Euro. Not available for sale in USA

Published in final edited form as:
Arch Ophthalmol. 2012 December : 130(12): . doi:10.1001/archophthalmol.2012.2280.

Continuous 24-hour Intraocular Pressure Monitoring With a Contact Lens Sensor: Safety, Tolerability, and Reproducibility in Glaucoma Patients

Kaweh Mansouri, M.D., M.P.H., Felipe A. Medeiros, M.D., Ph.D., Ali Tafreshi, B.S., and Robert N. Weinreb, M.D.
Hamilton Glaucoma Center and Shiley Eye Center, Department of Ophthalmology, University of California, San Diego, La Jolla, California

Conclusions—Repeated use of the CLS demonstrated good safety and tolerability. The recorded IOP patterns showed fair reproducibility, suggesting that data from 24-h continuous IOP monitoring may be useful in the management of glaucoma patients.

Main adverse events
Blurred vision 82 %
Hyperemia 80%
SPK 15%

Correlation for repeatability
Overall r=59
That is r-square = 35%

86

Glaucoma

Analysis of Continuous 24-Hour Intraocular Pressure Patterns in Glaucoma

Kaweh Mansouri, John H. K. Liu, Robert N. Weinreb, Ali Tafreshi, and Felipe A. Medeiros

Conclusions. Adapting the cosinor method to CLS data is a useful way for modeling the rhythmic nature of 24-hour IOP patterns and evaluating their reproducibility. Repeatable nocturnal acrophase was seen in 62.9% of patients. (Clinical Trials.gov number, NCT01319617.) (*Invest Ophthalmol Vis Sci.* 2012;53:8050–8056) DOI:10.1167/iovs.12-10569

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Current Eye Research 36(12): 1129–1136, 2011
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DOI: 10.3109/02713683.2011.606240

informa healthcare

ORIGINAL ARTICLE

Continuous IOP Fluctuation Recording in Normal Tension Glaucoma Patients

Bojan Pajic[1,3], Brigitte Pajic-Eggspuehler[1], and Ivan Haefliger[1]

[1]Swiss Eye Research Foundation, Lac Clinic ORASIS, Tillisstrasse, Reinach, Switzerland, [2]Division of Ophthalmology, Department of Clinical Neurosciences, University Hospitals of Geneva, Switzerland, [3]Eye Hospital VIDAR-ORASIS Swiss, University of Novi Sad, Faculty of Physics, Novi Sad, Serbia, and [4]School of Medicine, University of Basel, Basel, Switzerland

Overall sensimed is "sensitive" to IOP fluctuations

88

Evaluation of Continuous 24-Hour Intraocular Pressure Monitoring for Assessment of Prostaglandin-induced Pressure Reduction in Glaucoma

Gabor Holló, MD, PhD, DSc, Péter Kóthy, MD, PhD,* and Péter Vargha, MSc†*

(*J Glaucoma* 2014;23:e6–e12)

Conclusions: Our results suggest that the current CLS technique cannot be clinically used to monitor IOP decrease induced by topical medication in glaucoma, and has limited value in identification of transient IOP elevation periods.

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Summary of contact lens IOP devices

- Long way to go
- The ability of device to capture peak accurately is not excellent.
- Cautiously optimistic.
- FDA cleared on March 2016 not yet available for sale
- Prediction ...

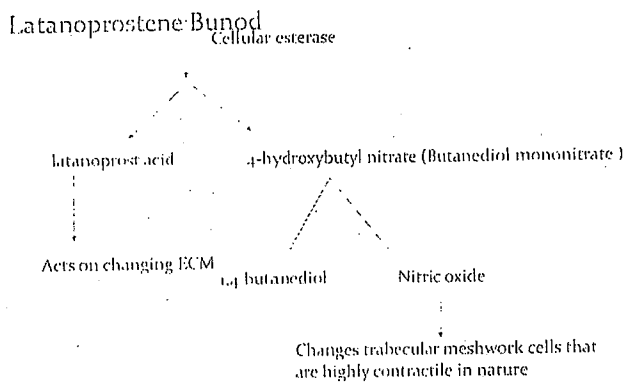
90

New drugs

Latanoprostene Bunod- Bausch and Lomb

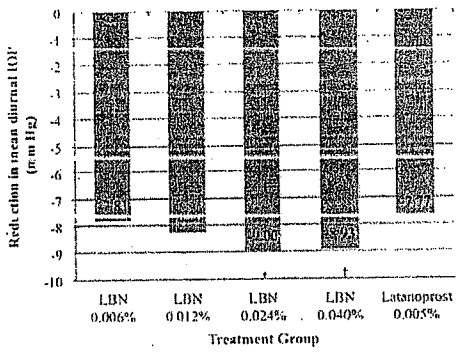
Latanoprostene bunod (LBN, BOL-303259-X) is a nitric oxide (NO)-donating prostanoid FP receptor agonist

Mechanism of action



A randomised, controlled comparison of latanoprostene bunod and latanoprost 0.005% in the treatment of ocular hypertension and open angle glaucoma: the VOYAGER study

Robert N Weinreb,[1] Tuyen Ong,[2] Baldo Scassellati Sforzolini,[2] Jason L Vittitow,[2] Kuldev Singh,[3] Paul L Kaufman,[4] for the VOYAGER study group



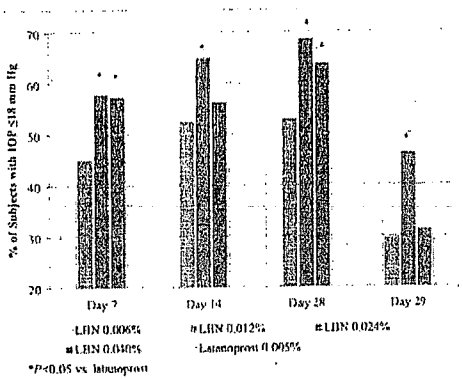


Figure 2 Proportion of subjects with intraocular pressure (IOP) ≤18 mm Hg at follow-up visits (intent-to-treat population). *p<0.05 versus latanoprost. LBN, latanoprostene bunod.

Latanoprostene Bunod 0.024% versus Timolol Maleate 0.5% in Subjects with Open-Angle Glaucoma or Ocular Hypertension

The APOLLO Study

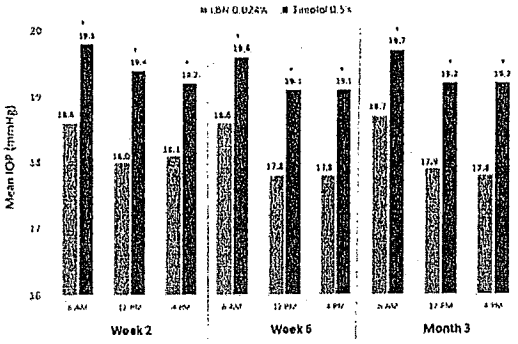
Robert N. Weinreb, MD,[1] Baldo Scassellati Sforzolini, PhD, Jason Vittitow, PhD, Jeffrey Liebmann, MD

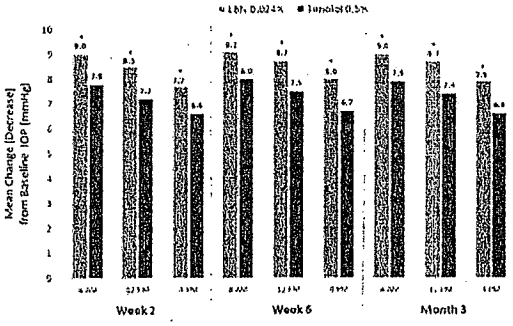
Timolol Maleate 0.5% or Latanoprostene Bunod 0.024%
IOP measured at 8 AM , 12 noon and 4 PM at week 2, 6, and 3 months

Latanoprostene Bunod 0.024% versus Timolol Maleate 0.5% in Subjects with Open-Angle Glaucoma or Ocular Hypertension

The APOLLO Study

Robert N. Weinreb, MD,[1] Bakle Sassaman Sjoerdsma, PhD,[2] Jason Vanstone, PhD,[2] Jeffrey Liebmann, MD[3]





Latanoprostene Bunod 0.024% versus Timolol Maleate 0.5% in Subjects with Open-Angle Glaucoma or Ocular Hypertension

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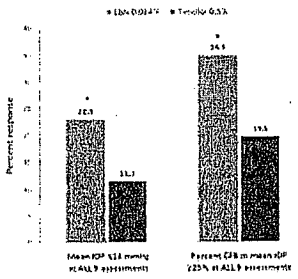

Figure 2. Response rates for key secondary efficacy end points after 3 months of treatment with latanoprostene bunod (LBN) 0.024% or timolol 0.5% treatment [ITT] population with baseline data as carried forward [LOCF]. CFB = change from baseline; IOP = intraocular pressure. *P ≤ 0.005 versus timolol.

Curriculum Vitae

Pinakin Gunvant Davey BS Optom, PhD, OD, FAAO
Professor
Western University of Health Sciences
Phone: 901-831-1562 (mobile)
909-247-1781 (home)
Email: contact@pinakin-gunvant.com

Education:

Bachelor of Science Optometry 1st Class (Aug 1995 – June 1999)
Elite School of Optometry, Chennai, India
Affiliated to Birla Institute of Technology and Science, Pilani, Rajasthan, India

Graduate Education
Doctor of Philosophy (11/1999- 12/2002) Mentor Professor Daniel O' Leary
Dissertation: "The influence of corneal dimensions on measurement related to glaucoma and ocular hypertension"
Anglia Polytechnic University (now called Anglia Ruskin University)
Department of Optometry and Ophthalmic Dispensing
Cambridge, England

Post-doctoral fellowship: Department of Psychological and Brain Sciences **Mentor Professor Edward A Essock PhD**, Ocular Imaging and Glaucoma
University of Louisville, Kentucky (02/2003/03/2006)

Professional education
Doctor of Optometry (2006-2010) Southern College of Optometry

Fellow of American Academy of Optometry (FAAO): Class of 2003 in scientist/research track.

Research Experience:

06/1998 to 06/1999 Histopathology lab in Sankara Nethralaya, Medical Research Foundation, Chennai, India. Supervisor consultant ophthalmologist: Dr. Jyotirmay Biswas

12/1999 to 01/2003 Data collection for Ph.D. studies; I conducted experiments at Department of Optometry and Ophthalmic Dispensing, Anglia Ruskin University, Cambridge England. Supervisors Professor Daniel O'Leary and Dr. Russell Watkins

08/2001 to 10/2001 Data collection for Ph.D. studies; I conducted research at Department of Ophthalmology, Norfolk and Norwich NHS Trust Hospital, Norwich, England. Supervisors' consultant ophthalmologists: Drs. David Broadway and Russell Watkins

11/2001 to 01/2002 Data collection for Ph.D. studies; I conducted research at Department of Glaucoma, Sankara Nethralaya, Medical Research Foundation Chennai, India. Supervisors' consultant ophthalmologists: Drs. Lingam Vijaya and Mani Baskaran

02/2003 to 03/2006 Data collection for post-doctoral research; I conducted research in the Department of Glaucoma, the Kentucky Lions Eye Care Center Louisville, Kentucky, USA. Supervisor: Dr. Edward Essock, PhD and consultant ophthalmologist: Dr. Joern Soltau

Additional training:

07/2007 Selected and attended Summer Institute for Faculty Development workshop conducted by Association of Schools of Colleges of Optometry.

02/2008 Attended three day training and workshop on Institutional Review Board fundamentals for IRB administrators

07/2008 Selected and attended The Summer Clinical Research Institute at The Ohio State University conducted by the American Optometric Association and American Academy of Optometry

Professional Experience:

07/1999 to 10/1999: Chennai, India
Sankara Nethralaya Eye Hospital Chennai, India; Optometrist in Department of Optometry
6/2002 to 01/2003: Norwich, England
Practitioner examining patients for refractive surgery and after care with Dr. Pandit (Ophthalmologist) and Mr. Conway (Optometrist)
Faculty at the Eye Center at Southern College of Optometry
07/2011 to present: Pomona, California USA
Faculty at the Eye Care Center at Western University of Health Sciences
Professional License
NPI number 1659685733

2010 to 2012 Therapeutic Optometrist Tennessee (2948)

2011 to present California Optometrist 14334 TLG

Academic Appointments:

12/1999 to 01/2003: Cambridge, England
Part-time lecturer in the Department of Optometry and Ophthalmic Dispensing, Anglia Polytechnic University, Cambridge, England
03/2006 to 06/2011: Memphis, Tennessee
Assistant Professor at Southern College of Optometry
10/2006 to present: Louisville, Kentucky USA
Adjunct faculty at University of Louisville, Kentucky USA
07/2009 to 2012: Memphis, Tennessee, USA
Adjunct faculty at the University of Memphis, Tennessee, USA
07/2011 to present: Memphis, Tennessee
Adjunct faculty at Southern College of Optometry
07/2011 to 2014: Pomona, California, USA
Associate Professor at Western University of Health Sciences, College of Optometry
07/2014 to present Pomona, California, USA
Professor at Western University of Health Sciences, College of Optometry
07/2015 to present Pomona California, USA
Director of Research, Western University of Health Sciences, College of Optometry

Membership in Professional Organizations:

2002 to present Association for Research in Vision and Ophthalmology
2002 to present American Academy of Optometry; **Fellow since 2003**
2006 to present Optometric Glaucoma Society (Appointment based on research merit)
2011 to present American Optometric Association
2011 to present California Optometric Association
2011 to present Inland Empire Optometric Society

Travel awards:

1) The Wellcome Trust, UK, Travel Grant (in the Ph.D. and post-doctoral category; £1000) to travel to Association for Research in Vision and Ophthalmology (ARVO) 2002.
2) Anglia Polytechnic University Travel Grant (£1000) to travel to American Academy of Optometry (AAO) 2002.
3) Student Travel fellowship award ($500), from AAO 2003.
4) Grawemeyer Research Fellowship from University of Louisville ($ 750) to travel to ARVO 2004
5) Student Travel fellowship award ($500), from AAO 2004
6) Grawemeyer Research Fellowship from University of Louisville ($ 750) to travel to ARVO 2005

Academic awards:

1) Best poster, World Optometry Day, Elite School of Optometry, 1996.
2) Best scientific paper award, Indian Contact Lens Conference, 1998.
3) Best contact lens project award, Elite School of Optometry, 1999.
4) Award for proficiency in public relations and communication Elite School of Optometry, 1999.
5) Award from the Governor Ernie Fletcher of Commonwealth of Kentucky for service to Kentucky Optometric Association and overall benefit to the state of Kentucky **(2007)**
6) WITELO Medal from University of Medical Science, Poznan, Poland in recognition of help for the Optometry Development in Poland **(2011)**
7) Awarded honorary membership to COMOF Optometric Extension Program national optometry organization Mexico in recognition of continued efforts for the progress and development of Optometry in Mexico **(2013)**

Patents:

Systems, methods, and computer-readable media for detecting and predicting a progression of retinal pathologies US 20130114041 A1
Patent Application Serial No. 61/234,803
Ref. 304044.84705P
Status: Awarded 2013
Inventors Drs. Khan Iftekahruddin, Paul Kim, **Pinakin Davey**
https://www.google.com/patents/US20130114041?dq=gunvant+iftekharuddin&hl=en&sa=X&ei=V7ZlUtAGppLIAe_ugJAL&ved=0CDYQ6AEwAA

Publications:

Peer reviewed and indexed journals

1) J Biswas, R Raghavendran, **G Pinakin**, D Arjundas: Presumed Eales' disease with neurological involvement Report of three Cases: ***Retina,*** 2001: 21:141-145.
2) RJ Watkins, L Panchaal, J Uddin, **P Gunvant**: Vertical cup-to-disc ratio - Agreement between direct ophthalmoscopic estimation, fundus biomicroscopic estimation and scanning laser ophthalmoscopic measurement. ***Optometry and Vision Science***, 2003: 80: 454-459.
3) **P Gunvant**, DC Broadway, RJ Watkins: Repeatability and reproducibility of the BVI ultrasonic pachymeter, ***Eye,*** 2003: 17:825-828.
4) EP Osuobeni, C Hegarty, **P Gunvant**: The effect of corneal thickness on the estimate of anterior chamber depth, ***Clinical and Experimental Optometry***, 2003: 86: 371-375.
5) **P Gunvant**, M Baskaran, L Vijaya, IS Joseph, RJ Watkins, M Nallaputla, DC Broadway, DJ O'Leary: Effect of corneal parameters on measurements using the Pulsatile Ocular Blood Flow Tonograph and Goldmann applanation tonometer. ***British Journal of Ophthalmology***, 2004; 88: 518-522.
6) **P Gunvant**, RJ Watkins, DC Broadway, DJ O'Leary: Repeatability and effects of sequential measurements with POBF Tonograph ***Optometry and Vision Science,*** 2004; 81: 794-799.
7) **P Gunvant**, Y Zheng, E Essock, P Chen, D Greenfield, H Bagga, M Bohem: Predicting subsequent visual field loss in glaucoma subjects with disc hemorrhage using RNFL polarimetry. ***Journal of Glaucoma,*** 2005; 14: 20-25.
8) EA Essock, Y Zheng, **P Gunvant**: Analysis of GDx-VCC polarimetry data by Wavelet-Fourier Analysis (WFA) across glaucoma stage. ***Invest Ophthal and Vis. Sci.*** 2005; 46: 2838-2847.
9) **P Gunvant**, DJ O'Leary, M Baskaran, DC Broadway, RJ Watkins, L Vijaya: Evaluation of tonometric correction factors. ***Journal of Glaucoma***, 2005; 14: 337-343.
10) **P Gunvant**, M Baskaran, L Vijaya, BC Hansen, IS Joseph, RJ Watkins, DC Broadway, DJ O'Leary: Comparison of pulsatile ocular blood flow in Indians and Europeans ***Eye,*** 2005, 19, 1163-1168.
11) CW Lievens, **P Gunvant**, J Newmann, M Gerstner, C Simpson: Effect of Proview self-tonometry on pharmaceutical compliance ***Clinical and Experimental Optometry***, 2006, 89, 381-385.
12) EA Essock, **P Gunvant**, Y Zheng, DF Garway-Heath, A Kotecha, A Spratt: Predicting visual field loss in ocular hypertensive patients using Wavelet-Fourier Analysis of GDx scanning laser polarimetry ***Optometry and Vision Science,*** 2007; 84: 380-387.
13) **P Gunvant,** CW Lievens, JM Newman III, MD Gerstner, FW Chang, CL Haine: Evaluation of some factors affecting the agreement between the Proview Eye Pressure Monitor and the Goldmann applanation tonometer measurements ***Clinical and Experimental Optometry*** 2007; 90: 290-295.
14) **P Gunvant**, Y Zheng, EA Essock, RS Parikh, S Prabakaran, JG Babu, AU Kumar, G Chandrashekar, R Thomas: Application of shape-based analysis methods to OCT retinal nerve fiber layer data in glaucoma ***Journal of Glaucoma,*** 2007; 16: 543-548.
15) **P Gunvant,** Y Zheng, M Tooth, G Hollo: Atypical retardation pattern: Can performance of classification be improved? ***Optometry and Vision Science,*** 2008; 85: 482-488.

16) **P Gunvant,** L Porsia, RJ Watkins, H Bayliss-Brown, DC Broadway: Relationships between central corneal thickness and optic disc topography in eyes with glaucoma, suspicion of glaucoma or ocular hypertension ***Clinical Ophthalmology*** 2008; 2: 591-599

17) **P Gunvant**, Y Zheng, EA Essock, RS Parikh, S Prabakaran, JG Babu, G Chandrashekar, R Thomas: Comparison of shape-based analysis of retinal nerve fiber layer data obtained from OCT and GDx-VCC ***Journal of Glaucoma,*** 2009: 18(6):464-471.

18) Y Kim, K Iftekharuddin, **P Gunvant**, M Tooth, G Hollo, EA Essock: Efficacy of Fractal analysis in identifying glaucomatous damage. ***SPIE* Progress in Biomedical optic and Imaging Medical Imaging** 2010, 76271 G1-10 ISBN 978-0.08194-8028-6.

19) Kowing D, Messer D, Slagle S, Wasik A; **V-POAG Study Group**: Programs to optimize adherence in glaucoma ***Optometry***. 2010; 81(7):339-50.

20) **P Gunvant**, RD Newcomb, EM Kirstein, VE Malinovsky, RJ Maddona, RE Meetz: Measuring accurate IOPs: Does correction factor help or hurt? ***Clinical Ophthalmology*** 2010:4: 611–616

21) A Elsheikh, D Alhasso, **P Gunvant**, D Garway-Heath: Multi-parameter correction equation for Goldmann applanation tonometry ***Optometry and Vision Science,*** 2011; 88:102-12.

22) **P Gunvant**, Y Kim, K Iftekharuddin, EA Essock Identifying glaucoma with multi-fractal features from optical coherence tomography ***SPIE* Medical Imaging: Computer Aided Diagnosis** 2011, 7963, 79633 S1-S9

23) Y Kim, K Iftekharuddin, **P Gunvant**, M Tooth, A. Garas, G Hollo, EA Essock Feature-based glaucomatous progression prediction using scanning laser polarimetry data ***SPIE* Medical Imaging: Computer Aided Diagnosis** 2011, 7963, 79633 T1-T9

24) **P Gunvant**, R Darner: Evaluation of corneal thickness measurements obtained using optical coherence tomography and ultrasound technique and determination of specificity in keratoconus screening ***SPIE* Medical Imaging: Image Perception, Observer Performance and Technology Assessment** 2011, 7966, 79661 B1-B8

25) **P Gunvant**, A Ablamowicz, S Gollamudi: Predicting the necessity of LASIK enhancement after cataract surgery in patients with multifocal IOL implantation ***Clinical Ophthalmology*** 2011:5 1281–1285

26) A Elsheikh, **P Gunvant**, SW Jones, D Pye, DF Garway-Heath In-Vitro experimental assessment of multi-parameter correction factors for Goldmann Tonometry ***J Glaucoma.*** 2013 Feb;22(2):156-63.

27) Kim Y, Iftekharuddin K, **Davey P**, Marta T, Garas A, Hollo G. Essock E Novel Fractal Feature-Based Multiclass Glaucoma Detection and Progression Prediction. ***IEEE Trans Inf Technol Biomed.*** 2013:17 269 - 276

28) **P Davey**, A Elshiekh, DF Garway-Heath Clinical evaluation of multi-parameter correction equations for Goldmann applanation tonometry ***Eye (Lond). 2013 May;27(5):621-9. doi: 10.1038/eye.2013.23. Epub 2013 Mar 15***

29) **P Davey**, K Nouri, S Zaczyk: Assessing the need and benefits of home tonometers in the management of patients with glaucoma ***Clinical Optometry*** 2013:5 19–27

30) **P Davey**, C Newman, A Ablamowicz, D Fuller: Diagnostic accuracy of keratoconus using anterior segment optical coherence tomography ***Optometry Reports*** 2013; volume 3:e2, 6-8

31) **P Davey:** Fabry disease: a survey of visual and ocular symptoms ***Clinical Ophthalmology*** 2014 Aug 19;8:1555-60

32) S Khanal, MThapa, L Racette, R Jhonson, **P Davey**, MR Joshi, GS Srestha: Retinal nerve fiber layer thickness in glaucomatous Nepalese eyes and its relation with visual field sensitivity *Journal of Optometry* (2014) 7, 217-224

33) J Wang, A Elsheikh, **PG Davey**, W Wang, F Bao, J Mottershead: Corneal topography matching by iterative registration *Proc Inst Mech Eng H.* 2014 Nov; 228(11):1154-67. doi: 10.1177/0954411914559080

34) EA Saidi, **PG Davey**, DJ Cameron The Effect of Zeaxanthin on the Visual Acuity of Zebrafish *PLoS One*. 2015 Aug 12;10(8):e0135211. doi: 10.1371/journal.pone.0135211. eCollection 2015

35) F Bao, J Wang 3, J Huang, Y Yu, M Deng, L Li, A Yu, Q Wang, **PG Davey**, A Elsheikh Effect of Misalignment between Successive Corneal Videokeratography Maps on the Repeatability of Topography Data *PLoS One* 2015 Nov 23;10(11):e0139541. doi: 10.1371/journal.pone.0139541. eCollection 2015

36) S Khanal, **PG Davey**, L Racette, GS Shrestha: Intraeye retinal nerve fiber layer and macular thickness asymmetry measurements for the discrimination of primary open-angle glaucoma and normal tension glaucoma. *J Optom.* (2015), http://dx.doi.org/10.1016/j.optom.2015.10.002

37) D Williams, Y Zheng, **PG Davey**, F Bao, M Shen, A Elsheikh: Reconstruction of 3D Surface Maps from Anterior Segment Optical Coherence Tomography Images Using Graph Theory and Genetic Algorithms. *Biomedical Signal Processing and Control* accepted 2016 Volume 25, March 2016, Pages 91–98

38) S Khanal, **PG Davey**, L Racette, M Thapa: Comparison of Retinal Nerve Fiber Layer and Macular Thickness for Discriminating Primary Open Angle Glaucoma and Normal Tension Glaucoma using OCT. *Clinical and experimental Optometry Accepted November 2015*

Non peer reviewed journals

39) **P Gunvant**: Vitamin-A deficiency and nutritional blindness ***The Indian Optician,*** 22-25 (March-April 1999).

40) **P Gunvant**, I Joseph: Comparison of visual acuity and contrast sensitivity with glasses and various water content hydrogel contact lenses ***Indian Contact lens Journal***. 20:3-6 (July 1999).

41) J Biswas, **P Gunvant**, MP Shanmugam, L Gopal: Solitary astrocytoma mimicking retinoblastoma ***Insight*** Vol. XVII, No. 2 (1999).

42) E Hocking & **P Gunvant:** Computer Vision Syndrome ***Optometry Today*** Vol 34 (1) March 2008: 34-36 ISSN 0048-203X

43) SB Steinman, E Hocking & **P Gunvant:** Electrophysiological Testing of the Eye I : ***Optometry Today*** Septermber 2008 Vol 34(3): 99-102 ISSN 0048-203X

44) SB Steinman & **P Gunvant:** Electrophysiological Testing of the Eye II: ***Optometry Today*** Septermber 2008 Vol 34(3): 119-122 ISSN 0048-203X

45) **P Gunvant** & FW Chang Diabetes: 10th Annual Diabetes Report
Diabetes: New Agents, New Technologies and New Approaches ***Review of Optometry*** Vol.145 (9) September 15th 2008: 64-77

46) D Vyas & **P Gunvant:** Nutritional therapeutics for the eye ***Review of Optometry*** Vol.146 (10) October 15th 2009: 29-34

47) **P Gunvant**, B Jennings, D Vyas: An early look at AREDS 2 Vol 148, April 15th 2011: 59-64

48) **P Gunvant:** Considerations in IOP measurement ***Review of Optometry*** Vol 148, July 15th 2011: 61-69

49) **PG Davey**: The Impact of Imaging Devices on Glaucoma Management ***Review of Optometry*** Vol 150 July 15 2013: 52-61

50) Suarez-Berumen K, **Davey PG** (2014) Macular Pigments Optical Density: A Review of Techniques of Measurements and Factors Influencing their Levels. JSM Ophthalmol 2(3): 1022.

Books and Book chapters

51) EA Essock, **P Gunvant** and Y Zheng: "Nerve Fiber Analyzer GDx-Progression" in **Optic Nerve Head and Retinal Nerve Fiber Analysis** Edited by lester M, Garway-Heath D, Lemij H; Savona, Dogma ISBN 88-87434-30-1; Pages 111-113

52) P Spry, CA Johnson, A Anderson, **P Gunvant**, M Fingeret, JL Keltner, M Wall, JS Werner "A Primer for Frequency Doubling Technology (FDT) Perimetry using the Humphrey Matrix" Welch Allyn and Carl Zeiss Meditec

53) **P Gunvant** Editor "Glaucoma: Current Clinical and Research Aspects" ISBN: 978-953-307-263-0; InTech publishers. Published November 2011
http://www.intechopen.com/books/show/title/glaucoma-current-clinical-and-research-aspects

54) EM Kirstein, A Elsheikh and **P Gunvant** "Tonometry – Past, Present and Future" in P Gunvant Editor "Glaucoma: Current Clinical and Research Aspects" ISBN: 978-953-307-263-0; InTech publishers.

55) **PG Davey** Editor "Ophthalmology clinical update" ISBN 980-953-307-1131-2; Intech Publishers Published September 2014 Available at:
http://www.intechopen.com/books/ophthalmology-current-clinical-and-research-updates

56) **PG Davey** Fabrys disease: Ocular manifestations and Visual symptoms, Book Chapter PG Davey Editor "Ophthalmology clinical update" ISBN 980-953-307-1131-2; Intech publishers DOI: 10.5772/58677.

57) **PG Davey** Imaging Devices and Glaucoma Management Book Chapter PG Davey Editor "Ophthalmology clinical update" ISBN 980-953-307-1131-2; Intech Publishers DOI: 10.5772/58568.

Peer reviewed conference presentation:

1) J Biswas, M Subbaram, V Padmanabhan, **P Gunvant**, A George, SK Ganesh: Changing pattern of uveitis in a referral clinic in India. ***58th Annual Conference of All India Ophthalmological Society*** (2000) Chennai, India page 206

2) J Biswas, R Raghavendran, **P Gunvant**, D Arjundas: Eales disease with neurological involvement - Report of three cases. ***Uveitis in the Third Millennium*** 2000, ISBN 0-444-50521-0, Pages 67-69

3) **P Gunvant**, RJ Watkins: What is an acceptable interval for sequential intraocular pressure measurement? ***Optometry and Vision Science*** 2001, 78: 63.

4) **P Gunvant**, M Baskaran, TM Ganeshbabu, L Vijaya, J Uddin, D Broadway, R Watkins: Determination of a 'true' intraocular pressure in open angle glaucoma & ocular

hypertension using a mathematical model. ***Invest Ophthal and Vis Sci*** 2002, 43 E-Abstract -1070

5) RJ Watkins, **P Gunvant,** J Uddin, DC Broadway: The influence of central corneal thickness & corneal curvature on intraocular pressure measurement with the Goldmann tonometer & the POBF pneumotonometer. ***Invest Ophthal and Vis Sci*** 2002,43 E-Abstract -3413.
6) **P Gunvant**, IS Joseph, M Baskaran, L Vijaya, DC Broadway, RJ Watkins: Pulsatile ocular blood flow measurements in healthy Asian eyes: Reference values for an Indian population. ***Ophthalmic and Physiol Optics***, 2002, 22: 574-575.
7) **P Gunvant**, DC Broadway, RJ Watkins: Effect of ethnic origin on Pulsatile Ocular Blood Flow. ***Ophthalmic and Physiol Opt***, 2002, 22: 582.
8) **P Gunvant**, DC Broadway, RJ Watkins: Does Optic Disc Topography Vary During Office Hours? ***Ophthalmic and Physiol Optics***, 2002, 22: 581-582.
9) **P Gunvant,** M Baskaran, L Vijaya: Effect of central corneal thickness on contact and non-contact tonometers. ***Optometry and Vision Science***, 2002, 79: 11
10) **P Gunvant**, M Baskaran, L Vijaya: Determination of "True intraocular pressure" in a normal Indian population. ***Optometry and Vision Science***, 2002, 79: 12
11) **P Gunvant**, M Baskaran, L Vijaya, R Watkins, DC Broadway, DJ O'Leary: Visual field loss and corneal parameters in open angle glaucoma and ocular hypertension. ***Invest Ophthal and Vis Sci,*** 2003, 44 E-Abstract - 2174
12) **P Gunvant**, M Baskaran, K Ramani, L Vijaya: Comparison of the Proview tonometer with the goldmann applanation tonometer. ***Optometry and Vision Science,*** 2003, 80: 226
13) **P Gunvant**, P Chen, Y Zheng, D Greenfield, H Bagga, M Bohem, E Essock: Predicting subsequent visual field loss in subjects with disc hemorrhage using RNFL polarimetry. ***Optometry and Vision Science,*** 2003, 80: 229
14) EA Essock, BC Hansen, Y Zheng, AM Haun, **P Gunvant**: "Mach Bands" in the orientation dimension: An illusion due to inhibition of near by orientations: ***Journal of Vision***, 2004, 4(8), 778a, http://journalofvision.org/4/8/778/, doi:10.1167/4.8.778
15) A Haun, **P Gunvant**, M Baskaran, L Vijaya: Central corneal thickness measurement using a pachometer: Mean or lowest values? ***Invest Ophthalmol Vis Sci,*** 2004, 45: E-Abstract 137
16) **P Gunvant**, Y Zheng, A Kotecha, DF Garway-Heath, EA Essock: Predicting Visual Field Loss in Ocular Hypertensive Patients Using Wavelet-Fourier Analysis (WFA) of GDx Scanning Laser Polarimetry. ***Invest Ophthalmol Vis Sci,*** 2004, 45: E-Abstract 5504.
17) **P Gunvant**, Y Zheng, EA Essock: Wavelet-Fourier analysis on retinal nerve fiber layer polarimetry data in patients with early glaucoma. ***Optometry and Vision Science,*** 2004, 81: 5
18) **P Gunvant**, S Demirel, CA Johnson: Reproducibility of visual field abnormalities identified by Frequency Doubling Technology perimetry in patients with early glaucoma. ***Optometry and Vision Science,*** 2004, 81: 6
19) M Baskaran, R George, **P Gunvant**, Sve Ramesh, P Raju, L Vijaya: True intraocular pressure (TIOP) with Orssengo and Pye model compared with Applanation Tonometry in a population based study. ***American Journal of Ophthalmology***, 2005, 139: 48
20) **P Gunvant**, Y Zheng, PG Schlottmann, DF Garway-Heath, EA Essock: Comparison of OCT and VCC RNFL estimates in identifying glaucoma using Wavelet-Fourier Analysis. ***Invest Ophthalmol Vis Sci,*** 2005, 46: E-Abstract 2510
21) **P Gunvant**, Y Zheng, RS Parikh, S Prabakaran, JG Babu, AU Kumar,

G Chandrashekar, R Thomas, EA Essock: Analysis of retinal nerve fiber layer data obtained by Optical Coherence Tomograph using Fourier Based Analysis. ***Invest Ophthalmol Vis Sci,*** 2006 47: E-Abstract 3338

22) EA Essock, **P Gunvant**, Y Zheng, RS Parikh, S Prabakaran, JG Babu, AU Kumar, G Chandrashekar, R Thomas: Comparison of shape-based analysis of retinal nerve fiber layer data obtained from OCT and GDX-VCC. ***Invest Ophthalmol Vis Sci,*** 2006, 47: E-Abstract 3638

23) FW Chang, **P Gunvant**, CW Lievens, JM Newman III, MD Gerstner, CL Haine: Ocular factors affecting measurements of the Proview Eye Pressure Monitor. ***Invest Ophthalmol Vis Sci,*** 2006, 47: E-Abstract 4435

24) **P Gunvant**, Y Zheng, M Tóth, C Haine, G Holló: Analysis of atypical retardance pattern RNFL estimates using shape-based analysis to identify glaucomatous eyes: ***Optometry and Vision Science,*** 2006; 83: E-Abstract 060049

25) **P Gunvant**, M Tóth, F Chang, C.L. Haine, G Holló: Diagnostic accuracy of polarimetry images with atypical retardance pattern in diagnosing glaucoma. ***Invest Ophthalmol Vis Sci,*** 2007 48: E-Abstract 502

26) F Jackson, **P Gunvant:** Repeatability and effect of sequential measurement on measurements obtained by Proview Eye Pressure Monitor. ***Optometry and Vision Science,*** 2007; 84: E-abstract 075186

27) MB Taub, FW Chang, **P Gunvant**: Factors affecting measurement of central corneal thickness. ***Optometry and Vision Science,*** 2007; 84: E-abstract 075286

28) JD Duncan, M Khan-Jalal, SB Steinman, **P Gunvant**: Evaluating the calibration of the Heine Lambda 100 retinometer. ***Optometry and Vision Science,*** 2007; 84: E-Abstract 075057

29) **P Gunvant:** Sources of errors in retinal imaging Multimedia poster **SECO 2008**

30) **P Gunvant,** RD Newcomb, EM Kirstein, VE Malinovsky, RJ Maddona, RE Meetz: Correcting Goldmann applanation tonometer measurements may not decrease error in measurement ***Invest Ophthalmol Vis Sci,*** 2008 49: E-Abstract 694

31) F Chang, M Eller, SB Steinman, **P Gunvant:** Accuracy of the Heine Lambda 100 Retinometer ***Invest Ophthalmol Vis Sci,*** 2008; 49: E-Abstract 2538

32) **P Gunvant,** F Jackson, E Hocking, D Taylor: Repeatability of home tonometry can be improved with increased training ***Optometry,*** 2008; 79, 6, 331-332

33) **P Gunvant,** E Hocking, D Taylor, M Cohler: Agreement of home tonometry with "New age" tonometers ***Optometry and Vision Science,*** 2008; 85: E-Abstract 085180

34) **P Gunvant,** D Taylor, E Hocking, M Cohler: Can the Individualized correction factor improve agreement of home tonometry ***Optometry and Vision Science,*** 2008; 85: E-Abstract 085181

35) **P. Gunvant**, R. Gurses-Ozden, K. Soules, Q. Zhou, B. Lo, Y.-J. Duh, GDx ECC Normative Database Study Group: Comparison of RNFL obtained using GDx-VCC & ECC algorithms and its correlation with visual field indices ***Invest Ophthalmol Vis Sci,*** 2009; 50: E-Abstract 4399

36) **P Gunvant**, R. Gurses-Ozden, K. Soules, Q. Zhou, Yi-Jing Duh, GDx ECC Normative Database Study Group. Diagnostic accuracy of Scanning Laser Polarimetry screening protocol in identifying glaucomatous and healthy eyes ***World Glaucoma Congress*** July 2009 Boston: Abstract 408.

37) SR Gollamudi, M Cohler, E Hocking, J Linn, **P Gunvant**: Evaluation of the efficacy of interferometer in predicting post-cataract visual outcome. ***American Society of Cataract and Refractive Surgery*** April 2010: Abstract 730921.

38) **P Gunvant**, P Kim, M Tóth, G Holló, E Essock, K Iftekharuddin: Predicting visual field loss in glaucomatous patients using Fast-Fourier analysis (FFA) of GDx-VCC Scanning Laser Polarimetry ***Invest Ophthalmol Vis Sci,*** 2010; 51: E-Abstract 4891

39) **P Gunvant** & M Cohler: Effect of repeated applanation on corneal biomechanical parameters and intraocular pressure measurements ***Optometry and Vision Science,*** 2010; 87: E-Abstract 100947

40) **P Gunvant** RS Srivatsav, S Varadharajan, SB Steinman: Predictive Value of Retinometer and Potential Acuity Meter in Estimating Post-Cataract Visual Outcomes ***Optometry and Vision Science,*** 2010; 87: E-Abstract 105934

41) SR Gollamudi, A Ablamowicz, **P Gunvant**: Investigation of parameters that predict the necessity of LASIK enhancement post cataract surgery with multifocal IOL implantation ***American Society of Cataract and Refractive Surgery*** March 2011: Abstract 731057

42) L Davis, F Chang **P Gunvant** Effect of topical anesthesia on parameters obtained using the ocular response analyzer ***Optometry and Vision Science,*** 2011; 88: E-Abstract 110964

43) **P Gunvant**, A Elsheikh D Garway-Heath Clinical evaluation of multi-parameter correction equations for Goldmann applanation tonometery ***Optometry and Vision Science,*** 2011; 88: E-Abstract 110813

44) **P Gunvant**, M Cohler, E Hocking Evaluation of Intraocular pressure estimates using Icare tonometer ***Optometry and Vision Science,*** 2011; 88: E-Abstract 110851

45) N Hovasapian S Zokaeim **P Davey** Effect of Corneal Parameters on Measurements Obtained Using iCare Rebound Tonometer, Goldmann Applanation Tonometer, and Ocular Response Analyzer ***Invest Ophthalmol Vis Sci,*** 2012; 53: E-Abstract 5032

46) **P Davey**, B Miller, K Dalton Evaluation and comparison IOP estimates obtained with Diaton tonometer with other clinical tonometers ***Invest Ophthalmol Vis Sci,*** 2012; 53: E-Abstract 5077

47) **P Davey**, L Gedge, A Ablamowicz,SR Gollamudi Reproducibility of anterior camber depth measured using Pentacam ***Optometry and Vision Science,*** 2012; 89: E-Abstract 30524

48) **P Davey**, D Josh Cameron Comparison of ocular parameters of Bugeye and Wild-type zebrafish using Optical Coherence Tomography ***Invest Ophthalmol Vis Sci,*** 2013; 54: E-Abstract4874

49) D Josh Cameron, **P Davey**: Non-invasive Intraocular Pressure Measurements in Zebrafish ***Invest Ophthalmol Vis Sci,*** 2013; 53: E-Abstract 1973

50) H Khanjaian, K Nouri, **P Davey:** Agreement of various tonometers in a clinical population, American Optometric Association, San Diego, June 2013.

51) K Nouri, H Khanjaian, **P Davey** "Repeatability of Ocular Response Analyzer: Best waveform vs. Mean values", ***Optometry and Vision Science,*** 2013; 90 E-Abstract 135967

52) G Comer, **P Davey**, M Chaglasian, J Cuadros, J Lawrenson, L Alexander, P Dabasia, Q Zhou, DF Garway-Heath "The IVue™ Normative Database Study- Methodology and

Distribution of OCT Parameters" ***Optometry and Vision Science,*** 2013; 90 E-Abstract 130192

53) R Shah, S Zaczyk, T Thamsopit, P Vyas, S Alvarez, B Santos, **P Davey** "Macular pigment optical density: Repeatability, inter eye correlation and effect of ocular dominance" ***Optometry and Vision Science,*** 2013; 90 E-Abstract 135209

54) **PG Davey**, F Carusone, S Alvarez, P Vyas, J Greenan, T Thamsopit, S Zaczyk, R Shah and C. Lievens "Association of Macular Pigment Optical Density (MPOD) and age in ocular healthy adults of different ethnicities -A preliminary report" ***Invest Ophthalmol Vis Sci,*** 2014; 54: E-Abstract 3492

55) DJ Cameron, **PG Davey** "Non-invasive ocular assessment in wildtype and disease model zebrafish" ***Invest Ophthalmol Vis Sci,*** 2014; 54: E-Abstract 2107

56) J Greenan, D Egan **PG Davey** "Visual Function Questionnaire in patients with Fabry disease and healthy controls." *Optometry and Vision Science,* 2014; 91 E-Abstract 145345

57) J Lee, S Alvarez, K Suarez-Berumen and **PG Davey** and Macular Pigment Study Group "Association of Macular Pigment Optical Density and Retinal Thickness in various Ethnicities" *Optometry and Vision Science,* 2014; 91 E-Abstract 145325

58) DJ Cameron, E Saidi, **PG Davey** "The effect of A2E and zeaxanthin on visual function: Modelling AMD pathogenesis and treatment in zebrafish." ***Invest Ophthalmol Vis Sci,*** 2015; 55: E-Abstract 5127

59) J Gray, F Bruce, DJ Cameron, **PG Davey** "Assessment of visual function of Bugeye zebrafish using the optokinetic response." ***Invest Ophthalmol Vis Sci,*** 2015; 55: E-Abstract 455

60) K McCray, V Paronian, A Seitz and **PG Davey** "Clinical assessment of Landolt C CSF test of the M&S Smart System contrast sensitivity testing device." ***Invest Ophthalmol Vis Sci,*** 2015; 55: E-Abstract 3902

61) JY Lee, K Suarez-Berumen, K Nouri; E Cook, A Solish, **PG Davey** "Macular pigment optical density in healthy and patients with open angle glaucoma" ***Invest Ophthalmol Vis Sci,*** 2015; 55: E-Abstract 1037

62) L Babakhan, A Parfenova, K Ha, R Maeda, S Thurman, A Seitz, **PG Davey** "Repeatability of measurements obtained using the quick CSF method" ***Invest Ophthalmol Vis Sci,*** 2015; 55: E-Abstract 3901

63) **PG Davey**, R Maeda, A Seitz "Assessment of Evans low contrast sensitivity in measuring log contrast sensitivity." ***Invest Ophthalmol Vis Sci,*** 2015; 55: E-Abstract 3903

64) M Sharma, **PG Davey**, R Maeda Case series describing Retinal Manifestations along with OCT findings amongst patients of Fabry Disease American Optometric Association annual meeting 2015

65) SM Thurman, A Seitz, **PG Davey** Correcting for Measurement Bias in Contrast Sensitivity Testing *Optometry and Vision Science, 2015; 92 E-Abstract 150066*

66) **PG Davey**, KL McCray, SM Thurman, A Seitz Sensitivity of Various Tests of Contrast Sensitivity to detecting visual impairment ***Optometry and Vision Science****, 2015; 92 E-Abstract 155176*

67) SM Thurman, **PG Davey,** A Seitz Improving Computerized Tests For Measuring Visual Field Deficits In AMD ***Optometry and Vision Science****, 2015; 92 E-Abstract 155313*

Editorial responsibilities

Editor in Chief Open Journal of Ophthalmology *2012 to 2014*

Editorial Board member

1. World Journal of Ophthalmology 2011
2. Optometry reports 2011
3. International Journal of Medical Imaging 2012-2014
4. The Open Access Journal of Science and Technology 2013
5. International Journal of Ophthalmology 2013
6. JSM Ophthalmology 2013
7. Journal of Medical Disorders 2013
8. Austin Journal of Clinical Ophthalmology 2013
9. Journal of Ocular Biology 2014

Reviewer for peer reviewed journals

1. Eye Official Journal of Royal College of Ophthalmologists; 2003 to present
2. Journal of Glaucoma; 2004 to present
3. British Journal of Ophthalmology; 2004 to present
4. Ophthalmic and Physiological Optics; 2004 to present
5. Graefe's Archive for Clinical and Experimental Ophthalmology; 2005 to present
6. Indian Journal of Ophthalmology; 2005 to present
7. Optometry and Vision Science; 2005, 2007 to present
8. Current Eye Research; 2006 to present
9. Optometry; 2007 to present
10. Clinical and Experimental Optometry; 2007,2009
11. Clinical Ophthalmology 2008-to present
12. Medical & Biological Engineering & Computing 2008
13. Clinical Optometry 2009-to present
14. Investigative Ophthalmology and Vision Science 2010
15. Journal of Refractive Surgery 2010 to present
16. Science Journal of Clinical Medicine 2012-2014

Ad-hoc Reviewer for granting agencies

1. National Institute for Health Research Scotland
2. The College of Optometrists, United Kingdom
3. Sultan Qaboos University Postgraduate Studies and Research Sultanate of Oman
4. Medical research Council, United Kingdom
5. Veterans Affairs

Invited lectures:

1) "Creutzfeldt-Jacob Disease and its effect on clinical practice" at the **Elite school of Optometry**, India. (2001)
2) "Are we measuring eye pressure accurately enough!" at the **House of Commons, England**, Science, Engineering and Technology across Europe, London (2002).
3) "Pulsatile ocular blood flow - future possibilities" at the **Medical Research Foundation** Chennai, India. (2002)
4) "Intraocular pressure correction factors: Do we have a good one?" at the **Medical Research Foundation** Chennai, India. (2003)

5) "Are we measuring central corneal thickness accurately" at the **Elite school of Optometry**, India (2003)
6) "Effect of corneal parameters on glaucoma related measurements" at **The Eye Foundation** Coimbatore, India (2005)
7) "Evaluation of tonometric correction factors" at the **L.V. Prasad Eye Institute** Hyderabad, India (2005)
8) "Some aspects of glaucoma management-diagnosis and detection of progression", four hours lecture Baypoint Anterior Segment Symposium **Evansville Indiana - July 2006.**
9) "Glaucoma management: Life under pressure" three hours lecture **Evansville Indiana** - Baypoint Anterior Segment Symposium **November 2006**
10) "Imaging devices and its use in primary care clinics" at **American Academy of Optometry Anaheim, 2008**, Primary Care Symposium
11) "Advances in ocular imaging and its use in management of glaucoma and retinal conditions" three hour lecture **Hawaii Optometric Association**, November 2008, Maui, Hawaii
12) "Intraocular pressure are you yesterdays headline" one hour lecture. **The Ohio State University** to the class of 2009 **April 2009**
13) "Updates on intraocular pressure measurement" one hour lecture. **The Ohio State University** to the class of 2010 **June 2010**
14) "Measuring intraocular pressure in mass screenings" one hour lecture, **Wills Eye Institute** 2010, Philadelphia, Pennsylvania
15) "Intraocular pressure telemetry : In vivo and in vitro options, one hour lecture **Wills Eye Institute** 2010, Philadelphia, Pennsylvania
16) "Life under pressure- Glaucoma lecture" **Aditya Jyot Eye Institute** Mumbai India December 2011
17) "Towards better Tonometry" **Narayana Nethrayala** Banglore India December 2011
18) "Life under pressure- Glaucoma lecture **Sankara Nethrayala, Medical Research Foundation** Chennai India December 2011
19) "Glaucoma A nerve in Distress" Association Mexicana de Facultades, Escuelas, Colegios y Consejos de Optometria **(AMFECCO), Mexico city** Mexico. February 2012
20) "Glaucoma" 36 hour course **COMOF Mexico City Mexico** June 2012
21) "Compare and contrast Optometry in India and USA" **Aditya Jyot Eye Institute College of Optometry** Mumbai India July 2012
22) "Ocular Physiology and Glaucoma" **SNDT Womens University** Mumbai, India July 2012
23) "Glaucoma" 24 hour course **COMOF Mexico City** Mexico November 2012
24) "Fabry eye disease-Optometry Making Diagnosis" **Pacific University**, Forest Grove, **Oregon** June 2013
25) "Fabry eye disease-Optometry Making Diagnosis" **Southern Nevada Optometric Association** June 2013
26) "Repeatability of biomechanical properties obtained using Scheimpflug technology", **World Glaucoma Congress**, **Vancover Canada** , July 2013
27) "Congenital glaucoma and ocular pathology in pediatric patient", two hour lecture at COMOF Optometric Extension Program, **Queretaro Mexico September 2013**
28) "Ocular manifestations of Fabrys disease" One hour presentation at The National Fabry Disease Foundation 4th Annual Fabry Family Conference **Greensboro, North Carolina September 2013**

29) "Fabry disease clinical course". UCLA Department of Nephrology and Cedars-Sinai Medical Center, One hour presentation on Ocular manifestations of Fabrys disease, **Los Angles, California October 2013**
30) "Fabry disease Ocular manifestations of a systemic disease" at Southern California **College of Optometry Marshall B Ketchum University** May 19th 2014
31) "Fabry disease Optometry making diagnosis" **San Francisco Optometric Society**, June 24th 2014
32) "Fabry disease Optometry making diagnosis" **Western Regional Conference October** 2014
33) Perceptual learning studies and Age related macular degeneration- one hour "**Kaiser Tustin Santa Ana** November 3rd 2015
34) Fabry disease Ocular manifestations of a systemic disease at **Western University of Health Sciences** December 2015
35) Fabry disease Research updates a **Joint program UCLA and Western University** event at Western University of Health Sciences December 2015
36) Fabry disease Optometry making Diagnosis at Southern California **College of Optometry Marshall B Ketchum University** May 18th 2015
37) "Advances in Ocular manifestations of Fabrys disease" Presentation at The National Fabry Disease Foundation 6th Annual Fabry Family Conference **Greensboro, North Carolina September 2015**
38) Improving diagnostic and visual performance in Age related Macular Degeneration Selected as one of twenty two vision Emerging Vision Scientists to present at **National Alliance for Vision and Eye Research Washington DC October 7th 2015**

Continuing education lectures:

1) Two hour glaucoma course "Imaging devices- Are we there yet?" 19967-GL, "Progress in Detecting Progression" 19966-GL, **Kentucky Optometric Association Fall Conference**, September 2007, Covington, Kentucky.
2) Two hour glaucoma course "Imaging and glaucoma" 19966-GL & 19967-GL **F& P Educational Seminars Inc. November 2008**, Evansville, Indiana.
3) One hour glaucoma course "Imaging devices- Are we there yet?" 19967-GL, **West Tennessee Optometric Association**, **November 2008**, Memphis, Tennessee.
4) Two hour retina course "Diagnosis and management of systemic diseases with posterior segment manifestations" 24579-PS **F& P Educational Seminars Inc. March 2009**, Evansville, Indiana.
5) Two hour glaucoma course "Diagnosis and management of glaucoma" 19966-GL and 25523-GL **F& P Educational Seminars Inc. August 2009**, Evansville, Indiana.
6) Two hour glaucoma course "Advances in glaucoma management" 19966-GL & 19967-GL **Eye Specialty Group August 2009.** Memphis Tennessee
7) Two hour glaucoma course "Analyzing Glaucoma Progression: The Impact of Advanced Technology" 26375-GL **Southern College of Optometry Fall CE October 2009** Memphis Tennessee
8) Two hour glaucoma course "Advances in glaucoma management: 19966-GL & 19967-GL" **Southern Eye Associates January 2010** Memphis Tennessee

9) Two hour glaucoma course "Visual Fields- Analysis, Advances and Future" 28165-GL two hour course **Eye Specialty Group May 2010** Memphis Tennessee
10) Two hour glaucoma course "Intraocular pressure measurement: The old, the new and the yet to come" 29163-AS **Eye Specialty Group August 2010** Memphis Tennessee
11) Three hour glaucoma course "Glaucoma management" 26375-GL and 25523-GL **Midwest Optometric Society October 2010**;Florence, Indiana
12) Two hour systemic disease course Diabetes: New Agents, New Technologies and New Approaches 23594-SD **F& P Educational Seminars Inc. November 2010**, Evansville, Indiana.
13) Two hour glaucoma course "Visual Fields- Past, present and Future" 28165-GL **Southern Eye Associates March 2011** Memphis Tennessee
14) Two hour posterior segment course "Advances in retinal imaging" 31274-PS **Eye Specialty Group April 2011** Memphis Tennessee
15) Two hour posterior segment course "Advances in retinal imaging" 31274-PS **West Tennessee Optometric Association May 2011** Memphis Tennessee
16) Two hour posterior segment course "Advances in retinal imaging" 31274-PS **Southern Eye Associates June 2011** Memphis Tennessee
17) Four hours glaucoma course at **Western University of Health Sciences July 2011**, Pomona, CA 1) Open Angle Glaucoma and Advanced Technologies 31847-GL one hour lecture 2) Pseudoexfoliation Syndrome and Glaucoma a Dangerous Duo 31848-GL two hour lecture, To Drop or to Chop Options of Medical and Surgical Mangement of Glaucoma one hour lecture
18) Nine hours glaucoma course at **Western University of Health Sciences September 2011**, Pomona, CA 1) Glaucoma back to basics two hour lecture 32406-GL, 2) Ocular imaging- the old, the new and yet to come two hour lecture 32402-GL 3) Toolbox in managing glaucoma: tonometry, pachymetry etc. two hour lecture 32403-GL 4) POAG, the greater part of glaucomas two hour lecture 32404 GL 5) Surgical options in managing glaucoma one hour lecture 32407-GL
19) One hour glaucoma course Progress in detecting progression one hour lecture 32883-GL **Western University of Health Sciences October 2011**, Pomona, CA
20) Six hour glaucoma course at **Western University of Health Sciences November 2011**, Pomona, CA 1) Open Angle Glaucoma and Advanced Technologies 31847-GL one hour lecture 2) Pseudoexfoliation Syndrome and Glaucoma a Dangerous Duo 31848-GL two hour lecture 3) To Drop or to Chop Options of Medical and Surgical Mangement of Glaucoma one hour lecture 4) POAG, the greater part of glaucomas two hour lecture 32404 GL
21) One hour glaucoma course Progress in detecting progression 32883-GL **Western University of Health Sciences November 2011**, Pomona, CA
22) One hour glaucoma course Progress in detecting progression 32883-GL **Western University of Health Sciences January 2012**, Pomona, CA
23) Six hour glaucoma course at **Western University of Health Sciences February 2012**, Pomona, CA 1) Open Angle Glaucoma and Advanced Technologies 31847-GL one hour lecture 2) Pseudoexfoliation Syndrome and Glaucoma a Dangerous Duo 31848-GL two hour lecture 3) To Drop or to Chop Options of Medical and Surgical Mangement of Glaucoma one hour lecture 4) POAG, the greater part of glaucomas two hour lecture 32404 GL

24) Two hour glaucoma course Intraocular pressure The Old, the new and the yet to come 29163-AS **Surgical Eye Care Foundation The 7th Annual Optometric Continuing Education Seminar**. February 2012, Memphis TN

25) Two hour glaucoma course "Grand rounds in glaucoma" **Western University of Health Sciences February 2012**, Pomona, CA

26) Six hour course **"Optowest 2012 California Optometric Association"** Four hours glaucoma and two hours Nutrition and the eye **April 2012**

27) Five hour glaucoma course **San Diego County Optometric Society presented May 20th 2012**

28) Two hour CE lecture Visual Fields Past, Present and Future **Orange County Optometric Society** June 2012

29) Four hours of CE lecture at **Hays-Haine Annual Symposium** at Western University of Health Sciences September 2012

30) One and half hour lecture at New advances in diagnosis and treatment of retinal conditions **Luxottica CE Event** lecture at Western University of Health Sciences November 2102

31) Four Hour CE lecture at **Mississippi Optometric Association Annual CE event** in Jackson MS November 2012

32) Two hour CE event at **Orange County Optometric Society** Fabrys Eye Disease and Ocular Manifestation February 2013

33) Two hour glaucoma CE lecture at **Inland Empire Optometric Association annual CE event.** March 2013

34) Two hour CE lecture glaucoma management at **Asian American Optometric Society** bi annual CE event March 2013

35) One Hour CE lecture at **Western University of Health Sciences**, Progression and glaucoma, April 2013

36) Three hour CE lecture at **Western University of Health Sciences** on Optic disc analysis and Visual field interpretation, April 2013

37) Three hour hands on interactive CE at Western University of Health Sciences, April 2013

38) Two hour CE lecture glaucoma management at **Asian American Optometric Society** bi annual CE event August 2013

39) Two hour CE lecture 1) Ocular manifestation of systemic disease and 2) glaucoma management at **San Fernando Valley Optometric Association** annual CE event September 2013

40) One hour lecture on Ocular manifestations of Fabrys disease San Joaquin Optometric Society, Modesto California October 2013

41) One Hour CE lecture at **Western University of Health Sciences**, Progression and glaucoma, November 2013

42) Two hour CE lecture at **California Optometric Association** Monterey Meeting, Ocular manifestations of Fabrys disease, November 2013

43) Two hour CE event at **Inland Empire Optometric Association,** Update on glaucoma medications and Fabrys disease **March 2014**

44) Four hours of at the **Western University of Health Sciences, Pomona California**, Two hours Medical Management in Glaucoma and Two hours of Surgical Considerations in Glaucoma. **March 2014**

45) Two hour CE at **the Optowest, 2014, California Optometric Association**, Fabrys disease Optometry making diagnosis. **April 2014**

46) One hour lecture at the **Asian American Optometric Association** "Glaucoma Medical Management update" **August 24th 2014**

47) One hour lecture at **San Mateo Optometric Association** "Fabry disease Optometry making diagnosis", **August 26th 2014**

48) One hour lecture at **Western University of Health Sciences** "Progress in detecting progression in glaucoma" September 6th 2014

49) Five hour course at **Sandiego County Optometric Association** on Glaucoma management **September 14th 2014**

50) Four hours CE lectures at **Western University of Health Sciences** on Glaucoma management **October 19th 2014**

51) Two hour CE at **Northwest Congress Portland OR**, on Fabry disease and Perceptual Learning studies in retinal degeneration February 21st and 22nd 2015

52) One hour CE webinar at Western University of Health Sciences Fabry Disease Optometry making Diagnosis **March 4th Webinar.**

53) Five hour course at **Sandiego County Optometric Association** on **March 15th 2015**

54) One hour course at Asian American Optometric Society on march 29th 2015 Pseudo exfoliation syndrome

55) Four hour CE lecture in glaucoma management, two hours drugs and glaucoma, two hours imaging and glaucoma **5th Midwest Optometric Society Conference** April 12th 2015

56) Four hour course Comprehensive Glaucoma Update at **Western University of Health Sciences** April 26th 2015

57) One hour CE lecture Fabry disease Ocular Manifestations of a systemic Disease at **Western University of Health Sciences May 14th 2015**

58) One hour CE lecture Fabry disease Ocular Manifestations of a systemic Disease at **Western University of Health Sciences August 13th 2015**

59) Five hour CE lecture; Glaucoma Back to Basics (2 hours) and Tool box in Managing Glaucoma (3 hours) at **Western University of Health Sciences September 13th 2015**

60) Two hour CE lecture; Epidemiology: Clinical trials in Glaucoma at **Western University of Health Sciences September 20th 2015**

61) Two hour CE lecture POAG Greater part of Glaucomas **at Western University of Health Sciences October 4th 2015**

62) Five hour CE lecture; Medical Management of Glaucoma A-Z (3 hours) Surgical Considerations in Glaucoma A-Z (2hours) at **Western University of Health Sciences October 18th 2015**

63) Two hour CE lecture: Decision making in glaucoma: Diagnosis and Management at **Western University of Health Sciences** November 7th 2015

64) Two hour CE lecture: Decision making in glaucoma: Diagnosis and management at Kaiser Annual CE event, Huntington Beach. January 30th 2016

65) Four hour CE lecture provided on interactive glaucoma course at Western University of Health Sciences Pomona CA February 28th 2016

66) Two hour CE lecture: Decision making in glaucoma: Diagnosis and management at Inland Empire Annual CE event, Ontario CA. March 6th 2016

Research Grants:

Title: The Influence of Corneal Dimensions on Measurement Related To Glaucoma And Ocular Hypertension
Principal Investigator: Pinakin Gunvant BS Optom (100% efforts)
Investigator: Daniel O'Leary PhD, David Broadway MD
Agency: Anglia Polytechnic University, Research.
Type: Bursary for graduate studies at Anglia Polytechnic University
Duration : 1999-2002
Type Restricted grant
Amount £49, 500 (approximate USD 89,100)

Title: Improving Glaucoma Treatment Based on Wavelet-Fourier Analysis of Retinal Nerve Fiber Layer Thickness
Principal Investigator: Edward Essock PhD, Joern Soltau MD, Philip Chen MD
Investigator: Pinakin Gunvant BS Optom, PhD (100% efforts)
Agency: Kentucky Science and Engineering Foundation
Type: KSEF-03-RDE-005 Emerging Technology,
Duration: 2004-2006
Type Restricted grant
Amount $168,096

Title: Factors Affecting Intraocular Pressure Measurement
Principal Investigator: Pinakin Gunvant BS Optom, PhD
Clinical Examiner: Felicia Jackson BS, Erin Hocking BS
Agency: Bausch and Lomb, USA
Type: Unrestricted grant
Duration: 2006-2011
Amount $17,060 (includes 10,000 equipment support)

Title: Collection of Normative and Glaucoma Data Using GDx VCC™ Scanning Laser Polarimetry
Principal Investigator: Pinakin Gunvant BS Optom, PhD
Clinical Examiner: Michael Gerstner OD, Jason Duncan OD, Charles Haine OD,MS
Agency: Carl Zeiss Medictec, USA
Type: Unrestricted grant for collection of normative data/**FDA trial**
Duration: 2006-2007

Amount $28,350

Title: Evaluation of the accuracy and clinical utility of Heine Lamba retinometer
Principal Investigator: Pinakin Gunvant BS Optom, PhD
Co-investigators: Jason Duncan OD, Scott B Steinman OD PhD
Clinical Examiner: Marzuka Khan-Jalal BS, Michael Eller BS, Meredith Cohler BS, Erin Hocking BA
Agency: Heine, USA.
Type: Unrestricted grant
Duration: 2007-2011
Amount $10,000

Title: Improving Glaucoma Treatment: Mathematical Analysis of Retinal Nerve Fiber Layer Thickness
Principal Investigator: Pinakin Gunvant BS Optom, PhD
Agency: ASSISI Foundation, Memphis USA
Type: Restricted grant
Duration: 2009-2011
Amount $79,900

Title: Collection of normative database for iVue OCT
Principal Investigator: Pinakin Gunvant Davey OD, PhD
Agency: Optovue Inc, Fremont, California
Type: Restricted grant/FDA trial
Duration: 2011-2012
Amount **$ 31,000**
http://clinicaltrials.gov/ct2/show/NCT01459731?term=pinakin+davey&rank=1

Title: Age related changes in Macular pigment Optical density
Principal Investigator: Pinakin Gunvant Davey OD, PhD
Agency: Zeavision LLC
Type: Restricted grant
Duration: 2013-2015
Amount **35,000**
Additional intramural grant from Western University of Health Sciences $5,000
Total Amount **$ 40,000**

Title: Collection of normative database for Maestro OCT
Principal Investigator: Pinakin Gunvant Davey OD, PhD
Agency: Topcon, Japan
Type: Restricted grant/ FDA trial
Duration: 2013-2014
Amount **$ 70,550**
http://clinicaltrials.gov/ct2/show/NCT01986478?term=pinakin+davey&rank=2

Title: Integrating Perceptual Learning Approaches into Effective Therapies for Low Vision.
Principal Investigator: Aaron Seitz PhD, Professor UC Riverside
Co-Investigator: Pinakin Gunvant Davey OD, PhD,
Agency: National Institute of Health 1R01EY023582
Total funding: **$1,774,188**
Type: **Subcontract** Restricted grant
Duration: 2013-2016
Co-investigator % effort: 12% (3 years)
Additional intramural grant from Western University of Health Sciences $5,000
Total funding: **$ 105,001.00**

Title: MAESTRO2: Topcon 3D OCT-1 Maestro Optic Disc and RNFL Study: Agreement and Repeatability comparison with the iVue
Principal Investigator: Pinakin Gunvant Davey OD, PhD
Agency: Topcon, Japan
Type: Restricted grant/ FDA trial
Duration: 2013-2014
Total funding **$ 27,800**

Title: TOPCON 3D OCT-1 MAESTRO REFERENCE DATABASE STUDY II
Principal Investigator: Pinakin Gunvant Davey OD, PhD
Clinical Investigators: Naida Jackirlic OD, Guru Sharma OD, Munish Sharma OD
Agency: Topcon, Japan
Type: Restricted grant/ FDA trial
Duration: 2015-2016
Total funding **$ 33,600**

Title: TOPCON 3D OCT-1 MAESTRO AGREEMENT AND PRECISION STUDY II
Principal Investigator: Pinakin Gunvant Davey OD, PhD
Clinical Investigators: Jessica Lee MS and Jennifer Kurtz
Agency: Topcon, Japan
Type: Restricted grant/ FDA trial
Duration: 2015-2016
Total funding **$ 116,900**

In Kind Grants to Southern College of Optometry

Ziemer Ophthalmology Pascal tonometer and supplies **$4,500**
Heidelberg Engineering Upgrade for Heidelberg Retina Tomograph **$16,500**
Carl Zeiss Meditec Frequency Doubling Perimeters two units **$22,000**
Carl Zeiss Meditec Upgrade to GDx and OCT units **$6,500**

In Kind grants to Western University of Health Sciences

Blood flow analyzer Paradigm technologies, Utah USA **$5,000**

IVue OCT Optovue Inc Fremont California USA equipment cost **$46,950.00 two year loan to Western University of Health Sciences.**

Teaching experience:

Lectures:

Anglia Polytechnic University Cambridge, England

1999-2002 Module leader (Instructor in charge), presented lectures, organized and supervised practical lab sessions for Optics of the eye. This course lasted for 1 semester total teaching time 36 hours.

2000-2002 Module leader (Instructor in charge), presented lectures, organized and supervised practical lab sessions for Experimental Methods in Optics & Principle Ophthalmic Lenses. This course lasted for 1 semester; three groups; total teaching time 108 hours.

2000-2002 Presented 6 weeks of lectures in a 12 week course on Microbiology for General and Ocular Pharmacology. This course lasted for 1 semester; total teaching time 18 hours.

2000-2002 Presented 2 weeks of a 12 week lecture course on Clinical Optometry; total teaching time 4 hours.

University of Louisville, Vision Science, Louisville, Kentucky, USA

2003-2006 Presented, 2 hours lecture in a 12 week course for Professor Edward A Essock on a course in vision science for graduate students.

Southern College of Optometry, Memphis, Tennessee, USA

2007 to 2011 Instructor for the Epidemiology part of OPT 323 Public health, Epidemiology and Geriatrics, presented lectures 5 weeks for a 16 week course total teaching time 10 hours.

2008 to 2011 Instructor in charge for the OPT 116, OPT 213 Biochemistry of the Eye the course is a 1.5 credit unit course each for 16 weeks, total teaching time 24 hours

2010-2011 OPT 308Glaucoma co-instructed the course (50%) with Dr. Dennis Matthews, 2 credit unit course for 16 weeks total teaching 16 hours

Glaucoma course for Texas Optometrists

12/2006, 07/2007, 12/2007, 04/2008, 12/2008 Thirteen hours of a thirty hour course lectures covering topics of anatomy and physiology of optic nerve, mechanisms of glaucomatous damage, intraocular pressure, optic disc evaluation with imaging technology, an update on primary open angle glaucoma, epidemiology of glaucoma and

ocular hypertension, update on ocular hypertension, normal tension glaucoma, secondary glaucoma and visual fields.

Western University of Health Sciences

2009 to present Instructor in charge for the Ocular physiology OPTM 5032, 2.0 credit unit with 26 lecture hours. Total teaching time 26 hours

2010 to present Instructor in charge for the Ocular Disease II Glaucoma OPTM 5032 3.5 credit unit with 36 lecture hours and 10 lab hours (4 groups). Total teaching time 76 hours

2011 to 2013 Elective course II Common Optometric Procedures. OPTM 8163, 1.0 credit unit 14 lecture hours. Total teaching time 14 hours

Laboratory and clinic based modules:

Anglia Polytechnic University Cambridge, England

1999-2000 Contact Lenses: I co-supervised the 12 lab sessions; total lab time 36 hours.

1999-2000 Further Clinical Optometry: I co-supervised 12 lab sessions; total lab time 48 hours.

1999-2002 Clinical Optometry: I co-supervised the 12 lab sessions; total lab time 36 hours

Southern College of Optometry, Memphis, Tennessee, USA

2006 Lab instructor for OPT 230 (Patient Management) total lab time 96 hours

2006 to 2011 Teaching clinical technology in Advanced Care Ocular Disease at the Eye Centre.

2007 to 2011 Co-instructor OPT 328 a seminar based course; presented lectures; 8 weeks for a 16 week course and organized and supervised practical lab sessions. This course lasted for 1 semester, total teaching time 10 hours

Thesis supervision: Co-supervised the following thesis

2001

1) Ms. Leena Panchal: "Vertical cup-to-disc ratio - Agreement between direct ophthalmoscopic estimation, fundus biomicroscopic estimation and scanning laser ophthalmoscopic measurement"

2) Mr. Javed Akhtar: "Effect of pupil dilation on measurements obtained using scanning laser ophthalmoscope"

2002

3) Ms. Sarah Burdis: "Effect of repeated tonometry on the pulsatile ocular blood flow of consensual eye."

06/2007 to 06/2009 Co-Supervisor and committee member PhD thesis
Donald Ladwig (University of Louisville)
"Retinal nerve fiber layer and visual function" student terminated with a Masters degree.

06/2009 to 06/2011 Co-supervisor and committee member **PhD thesis**
Paul Young June Kim (University of Memphis)
"Early Identification and Prediction of Risk for Glaucomatous Progression Using Fractal Analysis of Pseudo 2D Retinal Nerve Fiber Layer (RNFL) Data"

Masters of Science in Medical Sciences research projects

2012-2013

Kiana Nouri- Repeatability of Ocular Response Analyzer: Best waveform vs. Mean values
Bridgett Santos - Repeatability of Macular Pigment Optical Density (MPOD)
Duck Lee Young- Repeatability of Ocular Corvis ST in Intraocular Pressure Measurements
Jerry Lee- Repeatability of biomechanical parameters obtained using the Corvis
Silverio Alvarez- Inter-eye correlation of Macular pigment optical density in healthy eyes

2013-2014

Jessica Lee- Age related variations in macular pigment optical density
Eric Saidi- In-Vivo Intraocular pressure measurements in zebrafish

2014-2015

Violeta Paronian Comparison of various clinical contrast sensitivity testing techniques
Kaydee McCray Evaluation of contrast sensitivity in healthy versus disease eyes

Service to college and university:

Open days: 1999-2002

I was involved in the "Open Days" of the optometry department at Anglia Polytechnic University. Graduate students were involved in the demonstration of facilities and answered the questions which were asked by the prospective students.

Psychology Day 2003 and 2004

I was involved in the organizing of the Psychology Day; this is an open day which is conducted by the Department of Psychological and Brain Sciences at University of Louisville. This event marks the annual celebration and display of department facilities and research.

Research at Louisville 2004

I was one of the judges for the Research at Louisville where I was involved in judging the research posters presented by the Graduate students of the science and bio-medical departments.

Annual Louisville Regional Science Fair 2005

I was one of the judges at the Louisville Regional Science Fair in the Microbiology category, where I was involved in judging the research posters presented by the students.

American Academy of Optometry Annual Conference Tampa Florida 2004. A volunteer in the Academy's Membership Booth at Academy 2004 Tampa. To provide and be the primary source of information for the individuals interested in becoming Fellow of American Academy of Optometry (FAAO).

Mock board Part-3 for fourth year interns

1. Part-3 mock board Section-1 03/2006
2. Part-3 mock board Section-2 03/2007

Student Advisor Program

2006 to 2010 Student advisor for first year students. My duties are to mentor and general guidance when they are students at Southern College of Optometry.

Committees

2006 to 2011 Research and IRB Committee at Southern College of Optometry

01/2008 to 09/2008 Chairman, IRB Committee, Southern College of Optometry

2012 to present Appointed as a member of PhD feasibility planning Committee

- Submitted potential course document for the program
- Organized an Memorandum of Understanding with industry in support of the program
- Submitted a proposal for extramural funding to start the PhD program
- Worked on a NIH submission for a centre grant to develop graduate program.

2013-2014 Appointed by Dr. Philip Pumerantz to be part of Research Working Group, Strategic Planning Phase II; working group chair Dr. Steven Henriksen

2013 –to present Elected as a member of **Promotion and Tenure Committee**, College of Optometry, Western University of Health Sciences

2013- to present Elected as a member of **Academic Senate** as a representative of College of Optometry, Western University of Health Sciences

Student retention Webinars

Provided webinars to Doctor of Optometry batch of 2017

1) Insight into Optometry: Ocular Physiology June 25th 2013
2) Glaucoma: "The silent thief" July 23rd 2013

Service to profession:

2002 to present Member of Diseases Section at American Academy of Optometry

2007 to 2009 Continuing Education Quality Assurance Committee at American Academy of Optometry

2007 and 2008 Moderator

Invited and served as a moderator of Glaucoma section American Academy of Optometry annual conference

2009 and 2010 Reviewer

Invited and served as a reviewer for the of glaucoma scientific papers section at the American Academy of Optometry annual conference

2008 to 2011 President, American Academy of Optometry Tennessee Chapter

2011 to Present Mentor for the Developing Country Eye Researcher Fellows at Association for Research in Vision and Ophthalmology (ARVO)

2012- to present Appointed member of Education and Clinical Practices Committee, California Optometric Association

2013, 2014, 2015 invited to serve as an "Expert" in the popular training session for "Members-in-training- pre-doctoral and post doctoral fellows and residents" at Association for Research in Vision and Ophthalmology (ARVO) Annual meeting luncheon event "Pizza with an Expert".

2013 **Moderator** at Association for Research in Vision and Ophthalmology, **Retina and AMD symposium**

2013-2014 Elected Chair of continuing education at Inland Empire Optometric Association

2013-to present Appointed member of Membership Committee of California Optometric Association

2015-2016 Treasurer and Chair of Education committee Inland Empire Optometric Association

Service to community:

Vision Screening

1998 Participated in vision screening for school children; the event was funded by the Rotary Club of Chennai, India.

1999 Leader of the team; vision screening for senior citizens, event was funded and organized by Kaingra (a social organization).

2004 Glaucoma Screenings

A total of 249 individuals were screened for glaucoma, the tests included frequency doubling perimetry

1. Salud Familiar Health Fair and Conference.
   Primary focus was on Hispanic community. Held at the University of Portland, Portland, Oregon.
2. Health event at Pioneer Court House Square. Portland, Oregon.

2006-2007

Supervised students and represented Southern College of Optometry for a vision screening program conducted on

1. 04/22/2006 by the Whitehaven Community Centre, Memphis, Tennessee.
2. 04/29/2006 by the Parkway Garden United Presbyterian Church, Memphis, Tennessee.
3. 06/03/2006 by the Sisterhood Showcase convention, Memphis, Tennessee.
4. 06/10/2006 by the Outreach Rising Sun, Memphis, Tennessee.
5. 05/20/2007 by the Tennessee Optometric Association in collaboration with Lions International for the Special Olympics at Nashville, Tennessee.

2007-2008

Supervised students and represented Southern College of Optometry for a vision screening program conducted on

1. 06/02/2007 by the Raleigh Presbyterian Church, Memphis, Tennessee
2. 06/30/2007 by the Breath of Life SDA Church, Memphis, Tennessee
3. 04/06/2008 by the BAPS Hindu Mandir (Temple), Memphis, Tennessee

2009-2010

Supervised students and represented Southern College of Optometry for a vision screening program conducted on

1. 05/08/2010 by the BAPS Hindu Mandir (Temple), Memphis, Tennessee

2012

Supervised students and represented Western University of Health Sciences, College of Optometry for a vision screening program conducted

1) BAPS Hindu Temple at Chino Hills Eye screening as a part of multispecialty health screening event September 16th 2012
2) HMPS Inc. ANNUAL HEALTH FAIR Co-Sponsored by Tarsadia Foundation & Supported by Anekant Community Center Eye screening as a part of multispecialty health screening event October 7th 2012
3) California Zoroastrian Center ANNUAL HEALTH FAIR Eye screening as a part of multispecialty health screening event October 21st 2012
4) California Lions Friends in Sight and Sai Baba Organization Eye screening Event December 8th 2012
5) Lecture at BAPS Temple Chino Hills, Common Eye Problems, This lecture was delivered to about 1000 people as process to create awareness about ocular problems and to introduce the Western University of Health Sciences Eye Care Center to the neighboring community.
    - As a direct influence of this and ongoing communication we get constant referrals of patients from medical internists
    - I also won the prize for the Faculty that generated maximum new referrals, in a friendly competition conducted by the Eye Care Center at Western University of Health Sciences.
6) Lecture and eye screening to Ontario Centre Senior and Adult Community on glaucoma. October 11th 2012
7) Wrote articles for Inland Valley News, a printed publication that has wide range of circulation. Articles submitted on topic "Protect your eyes you cannot replace them" and "Glaucoma: The Silent thief"

References
Available upon request

CALIFORNIA STATE BOARD OF OPTOMETRY

STATE BOARD OF OPTOMETRY
2450 DEL PASO ROAD, SUITE 105, SACRAMENTO, CA 95834
P (916) 575-7170 F (916) 575-7292 www.optometry .ca.gov

Continuing Education Course Approval Checklist

Title: Culinary Guide to Ophthalmic Diseases
Provider Name: John Lee

☒ Completed Application
- Open to all optometrists? ☒ Yes ☐ No
- Maintain record agreement? ☒ Yes ☐ No

☐ Detailed Course Description
☒ PowerPoint and/or other presentation materials
☐ Advertising (optional)
☒ CV for EACH course instructor
☒ License Verification for each course instructor
- Disciplinary History? ☐ Yes ☒ No

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CONTINUING EDUCATION COURSE APPROVAL APPLICATION

$50 Mandatory

Pursuant to California Code of Regulations (CCR) § 1536, the Board will approve continuing education (CE) courses after receiving the applicable fee, the requested information below and it has been determined that the course meets criteria specified in CCR § 1536(g).

In addition to the information requested below, please attach a copy of the course schedule and topical outline of the subject matter. Applications must be submitted 45 days prior to the course presentation date.

Please type or print clearly.

Course Title	Course Presentation Date
Culinary Guide to Ophthalmic Diseases	05/15/2016

Course Provider Contact Information

Provider Name

John (First) Lee (Last) H (Middle)

Provider Mailing Address

Street 2575 Yorba Linda Blvd City Fullerton State CA Zip 92831

Provider Email Address jlee@ketchum.edu

Will the proposed course be open to all California licensed optometrists?	☒ YES ☐ NO
Do you agree to maintain and furnish to the Board and/or attending licensee such records of course content and attendance as the Board requires, for a period of at least three years from the date of course presentation?	☒ YES ☐ NO

Course Instructor Information

Please provide the information below and attach the curriculum vitae for each instructor or lecturer involved in the course. If there are more instructors in the course, please provide the requested information on a separate sheet of paper.

Instructor Name

Timothy (First) You (Last) T (Middle)

License Number G80625	**License Type** Physician's and Surgeon's
Phone Number (714) 972-8432	**Email Address** tyou@ocretina.net

I declare under penalty of perjury under the laws of the State of California that all the information submitted on this form and on any accompanying attachments submitted is true and correct.

Signature of Course Provider 410 4/1/2016 *Date*

AAOS

ASIAN AMERICAN OPTOMETRIC SOCIETY
PRESENTS

2016 May Honors Symposium

Sunday, May 15, 2016
FEATURING 5 HOURS OF CONTINUING EDUCATION

Agenda:

9:00am – 9:10am	**Welcome** Jason Lam, OD, MBA President, AAOS
9:10am – 10:50am (2 Hours CE)	**Decision Making in Glaucoma** Pinakin Davey, OD Western University of Health Sciences
10:50am – 11:10am *(20 min)*	*Break*
11:10am – 12:00pm (1 Hour CE)	**Idiopathic Orbital Inflammatory Syndrome** Munish Sharma, MD, OD Western University of Health Sciences
12:00pm – 1:00pm *(60 min)*	*Lunch*
1:00pm – 1:50pm (1 Hour CE)	**Culinary Guide to Ophthalmic Diseases** Timothy You, MD Orange County Retina
1:50pm – 2:40pm (1 Hour CE)	**Retinal Toxicity of Systemic Medications** Rajiv Rathod, MD, MBA Orange County Retina

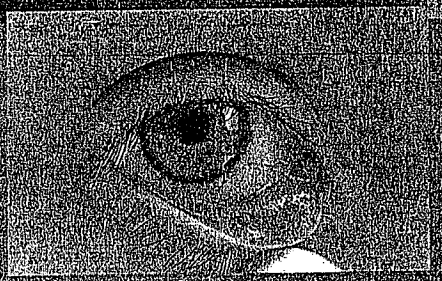
Orange County Retina Group

A Culinary Guide to Ophthalmic Diseases

Timothy Yoo, MD
May 15, 2016
www.ocretina.net
tyoo@ocretina.net

orange county retina

Stye or Sty



Hordeolum or Chalazion

Stye or Sty

Stye: an acute bacterial infection of the secretory gland of the eyelid

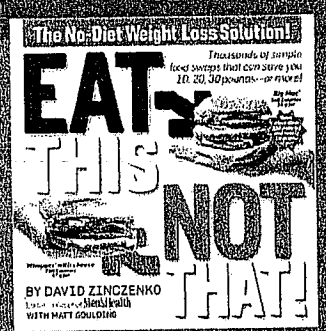
Stye or Sty

"*sty*"-15th cent old English *styany, stigend* = "*riser*"

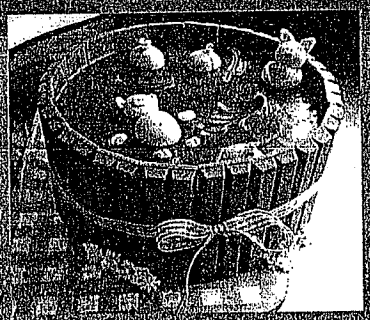
Homonym: "*sty*"-old Eng/Norse, *farrow (pig) and stig (hall)*

"*hordeolum*": *Hordeolus* - *barley growing*

Pig Sty

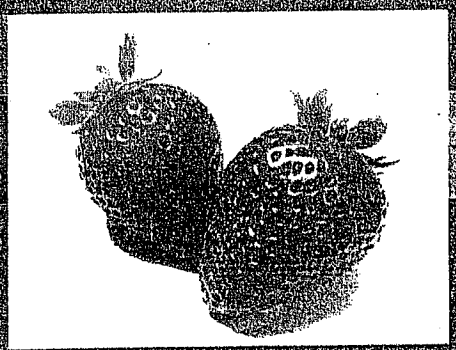


Pig Sty

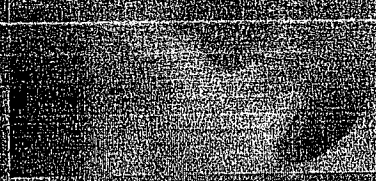


Pig Sty

Strawberry



Strawberry



Capillary Hemangioma

Strawberry hemangioma

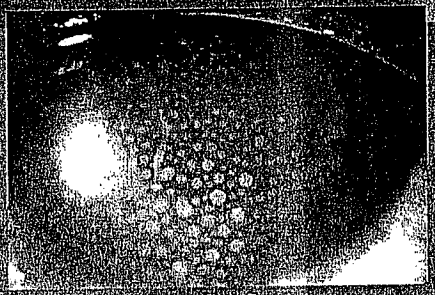
Benign vascular lesions of the head and neck in pediatric age

Capillary hemangioma

Endothelial aggregates lack attempt for lumen formation

Mutton Fat in Broth

Granulomatous KP Uveitis



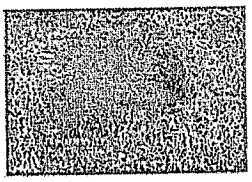
Mutton Fat Keratic Precipitates

Granulomatous KP Uveitis

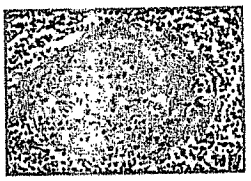
KP = frost on the inside of the corneal window

Definition

- Multisystem chronic inflammation characterized by non caseating granulomas.



Caseating granulomas
TB



Non caseating granulomas
Sarcoidosis

Sunflower

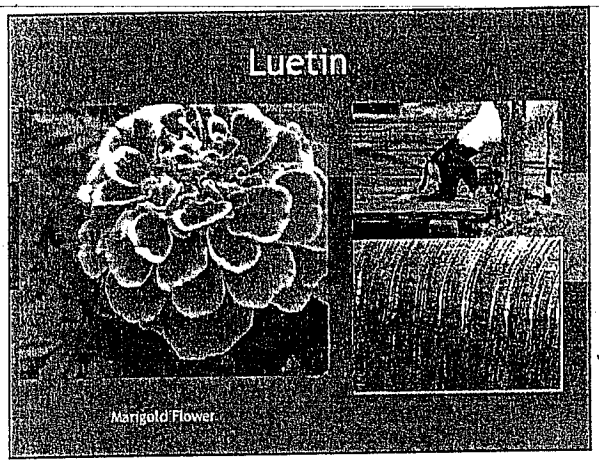
Sunflower Cataract

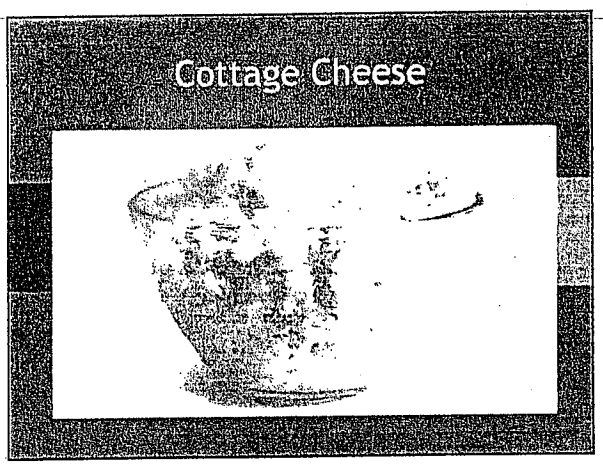
Goyal V. Sunflower cataract Wilsons' disease. J Neurol 2000

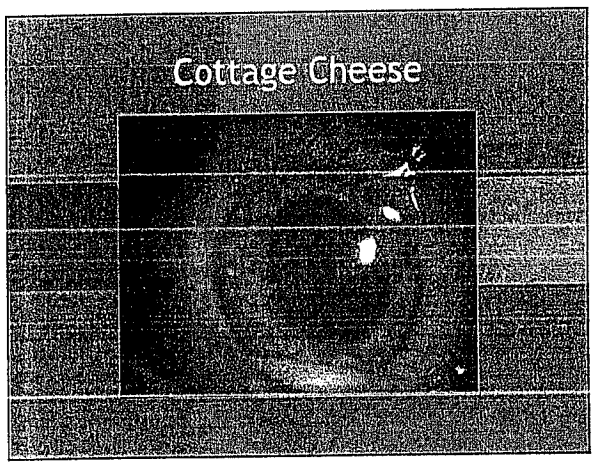
Sunflower Cataract

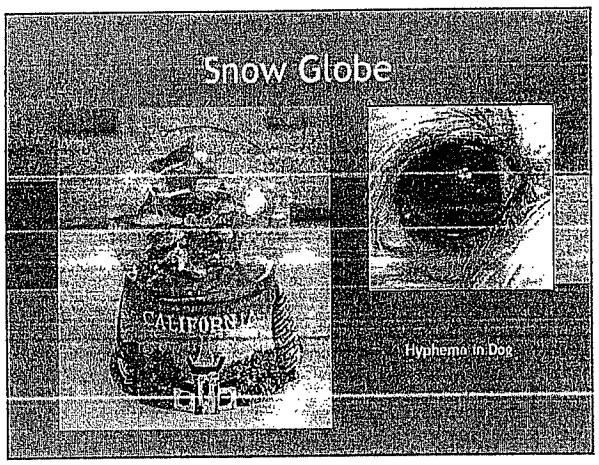
Kayser-Fleischer Ring

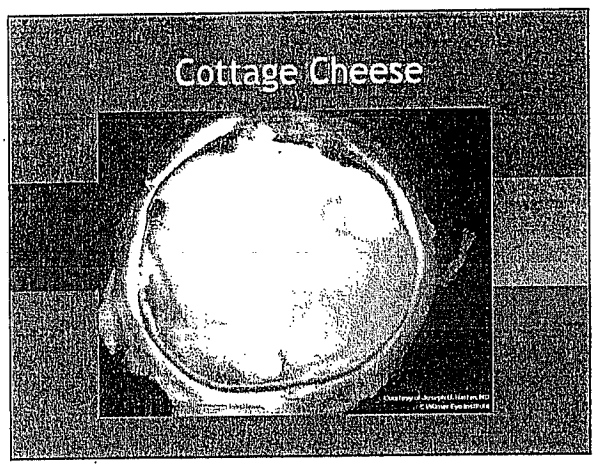
Goyal V. Sunflower cataract Wilsons' disease. J Neurol 2000

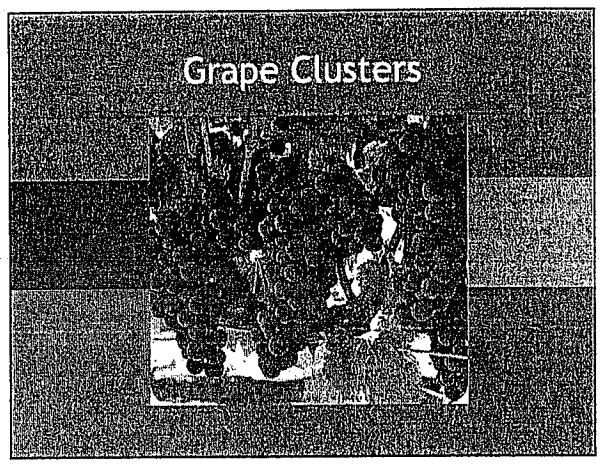

Luetin
Marigold Flower


Cottage Cheese

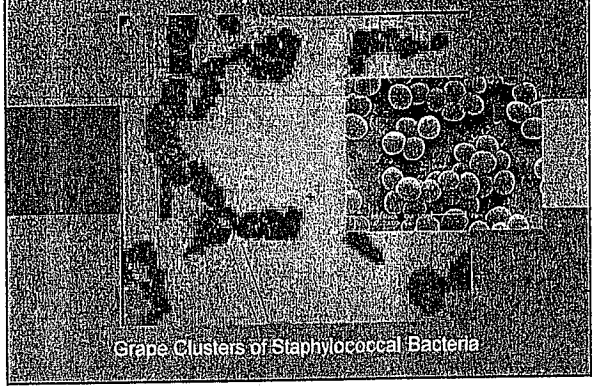

Cottage Cheese


Snow Globe
Hyphema in Dog


Cottage Cheese

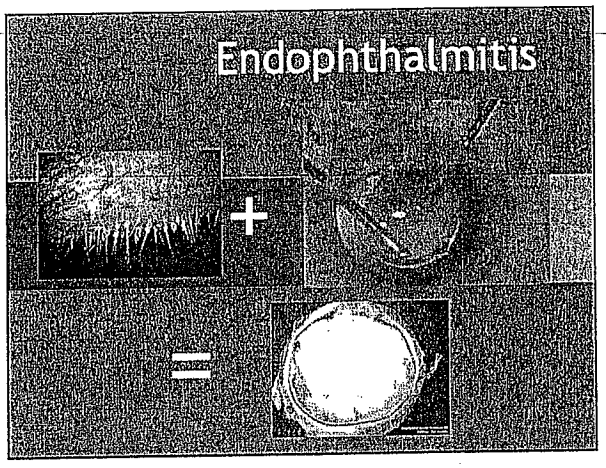

Grape Clusters

Endophthalmitis



Grape Clusters of Staphylococcal Bacteria

Endophthalmitis

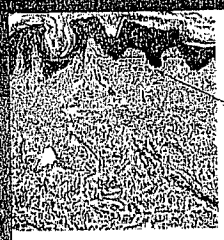


Café au Lait Spots (Coffee with Milk)

Café au Lait Spots (Coffee with Milk)

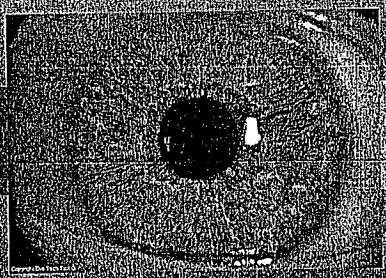
Neurofibromatosis

Café au Lait Spots (Coffee with Milk)



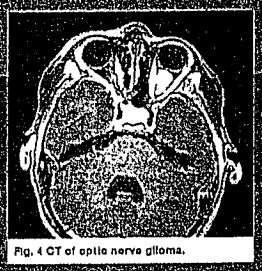
- Increased melanin pigment with the basilar epidermis
- No increase in melanocytes

Neurofibromatosis



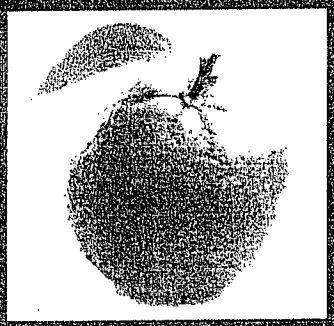
Lisch Nodules

Café au Lait Spots (Coffee with Milk)



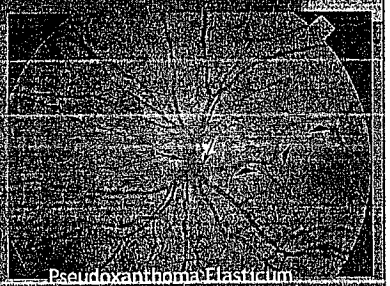
Neurofibromatosis with Optic Nerve Glioma

Orange



Peau d'Orange

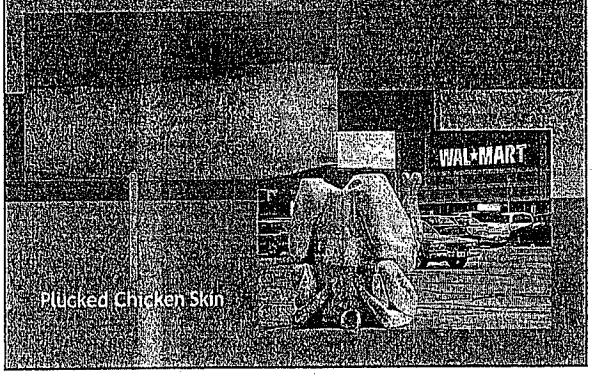
Peau d'Orange



Pseudoxanthoma Elasticum

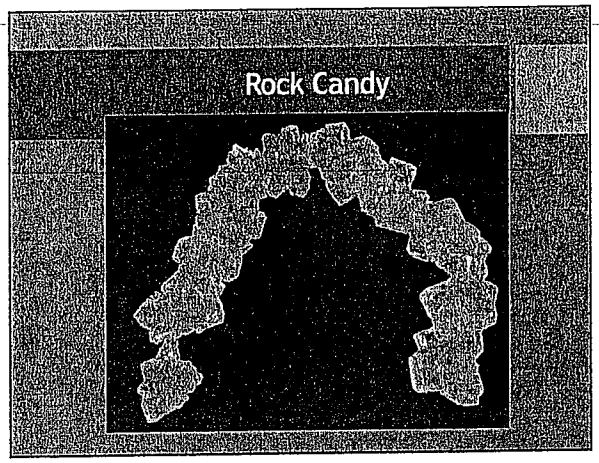
Angioid Streak

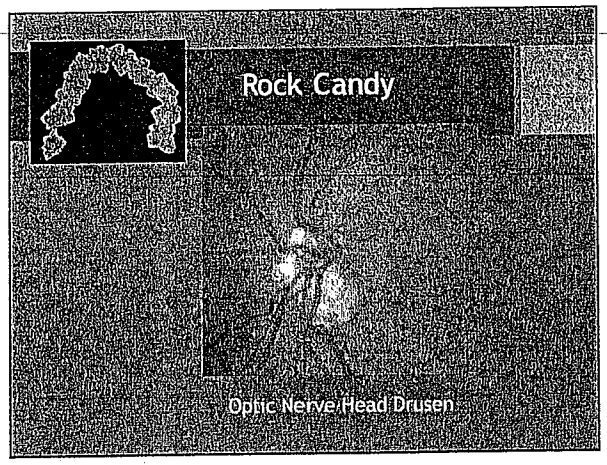
Pseudoxanthoma Elasticum

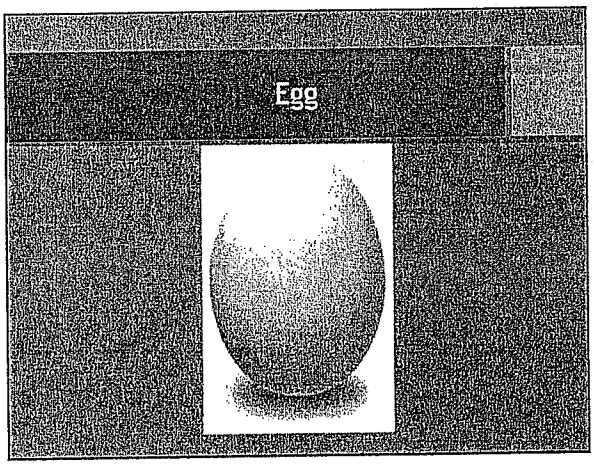


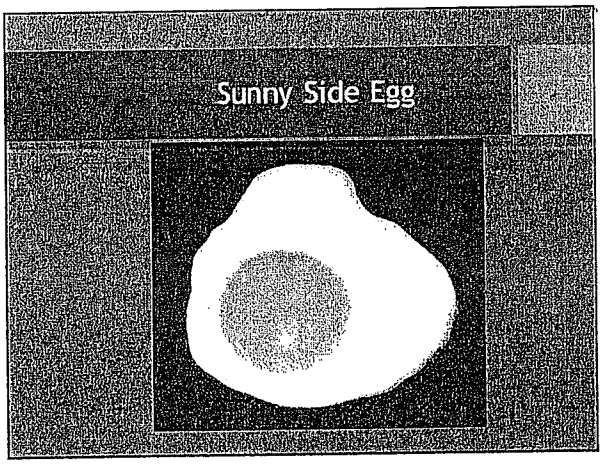
Plucked Chicken Skin

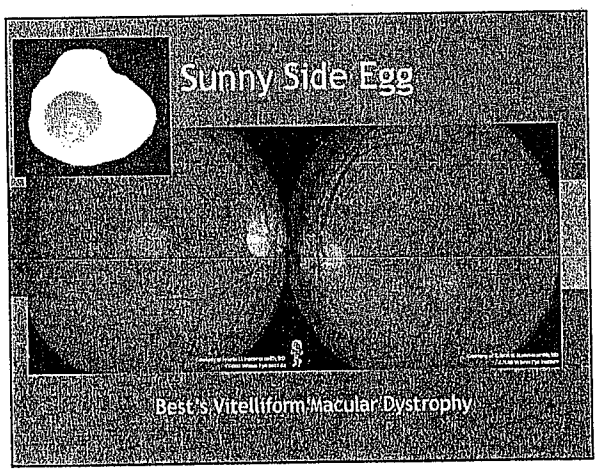
Pseudoxanthoma Elasticum

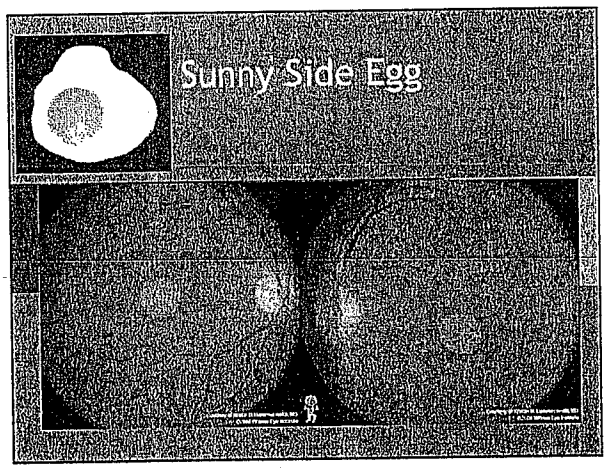

Rock Candy

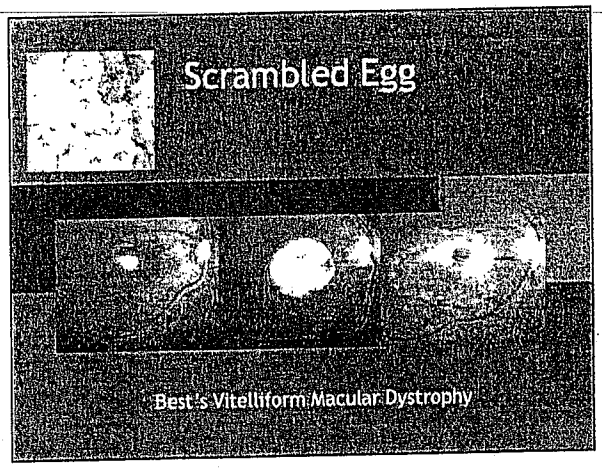

Rock Candy
Optic Nerve Head Drusen

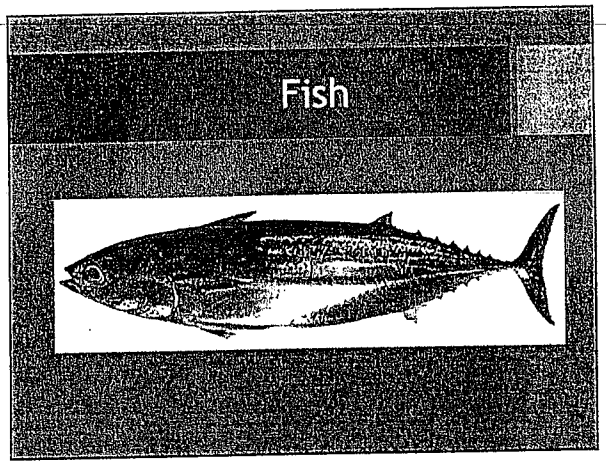

Egg

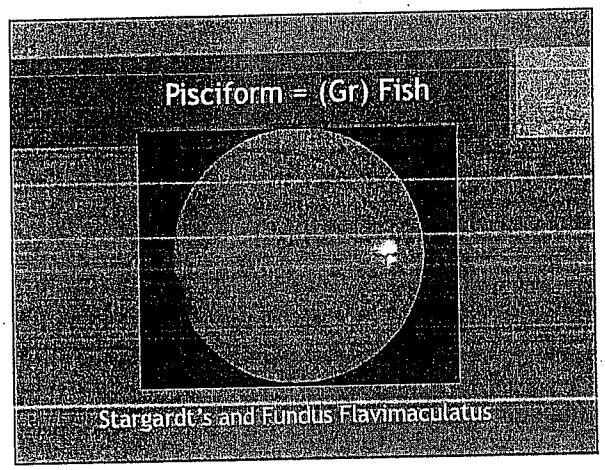

Sunny Side Egg

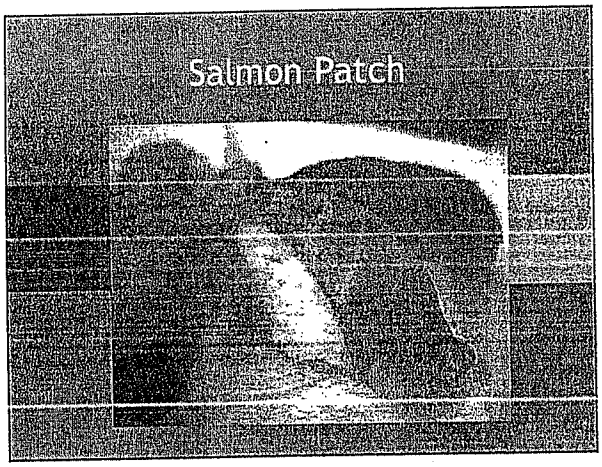

Sunny Side Egg
Best's Vitelliform Macular Dystrophy

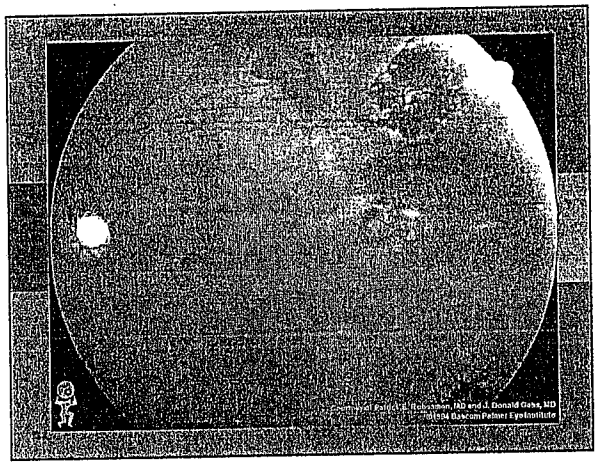

Sunny Side Egg

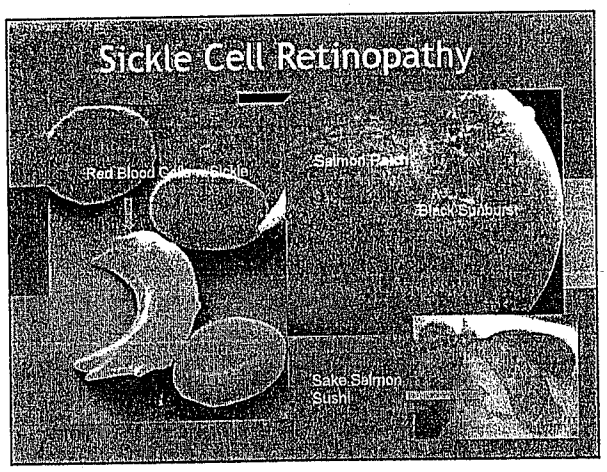

Scrambled Egg
Best's Vitelliform Macular Dystrophy

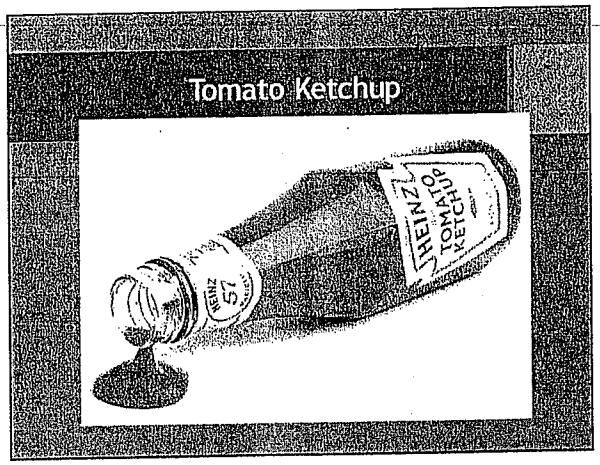

Fish

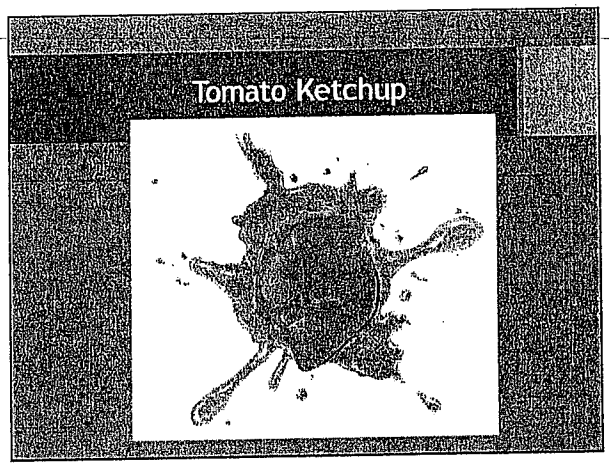

Pisciform = (Gr) Fish
Stargardt's and Fundus Flavimaculatus

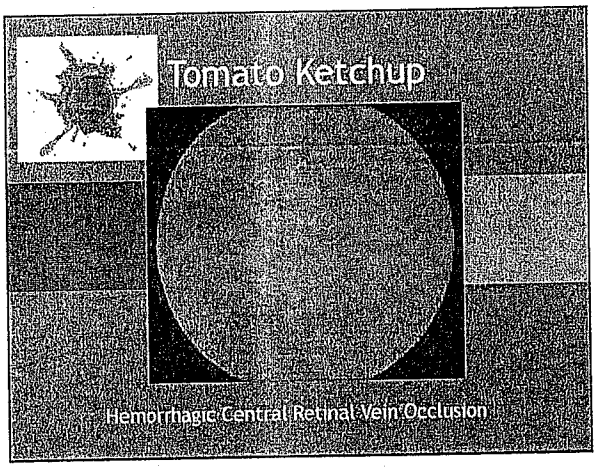

Salmon Patch

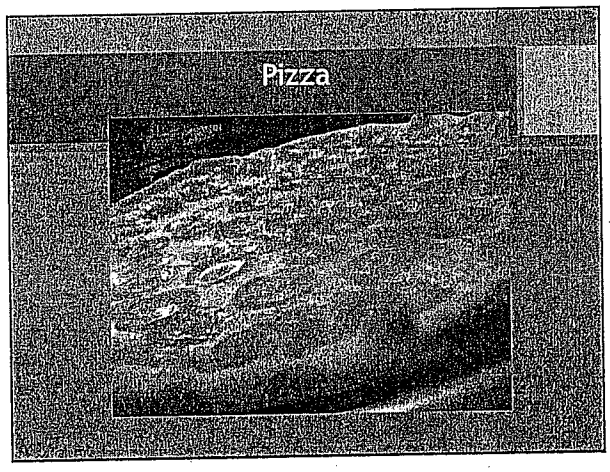


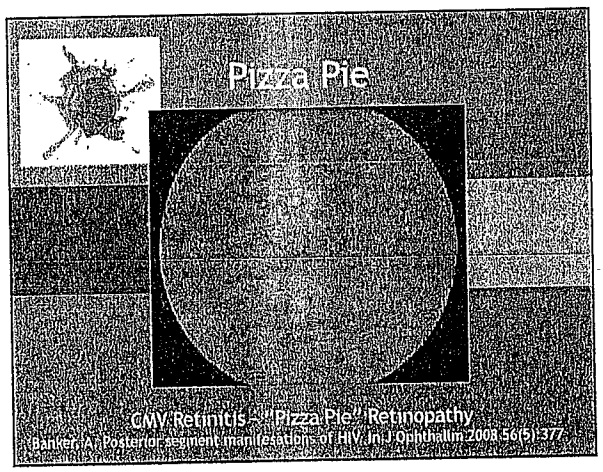

Sickle Cell Retinopathy
Salmon Patch
Sake Salmon
Sushi

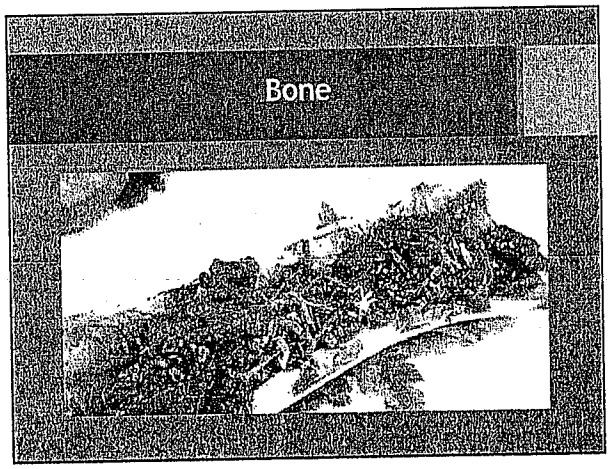

Tomato Ketchup
HEINZ
TOMATO
KETCHUP
HEINZ
57

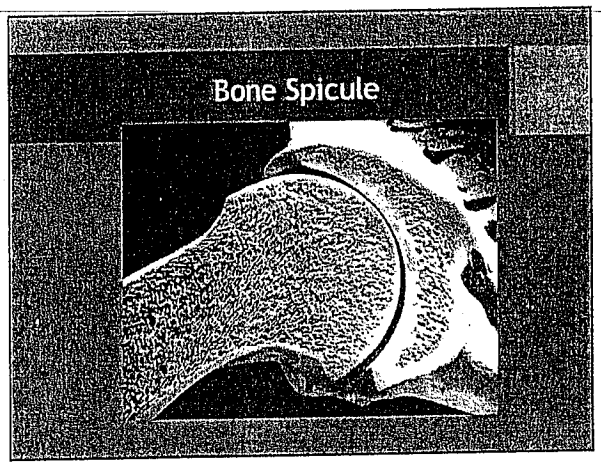

Tomato Ketchup

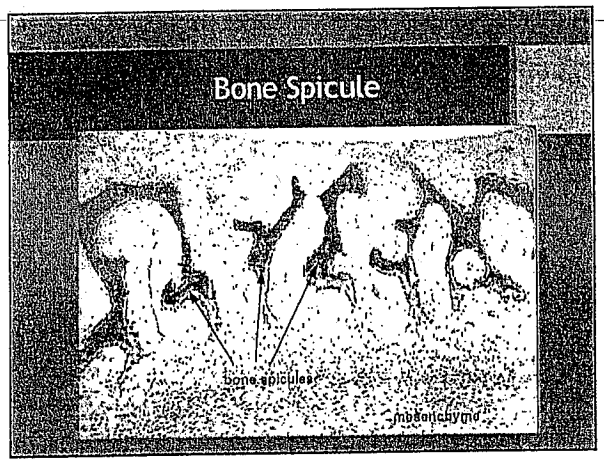

Tomato Ketchup
Hemorrhagic Central Retinal Vein Occlusion

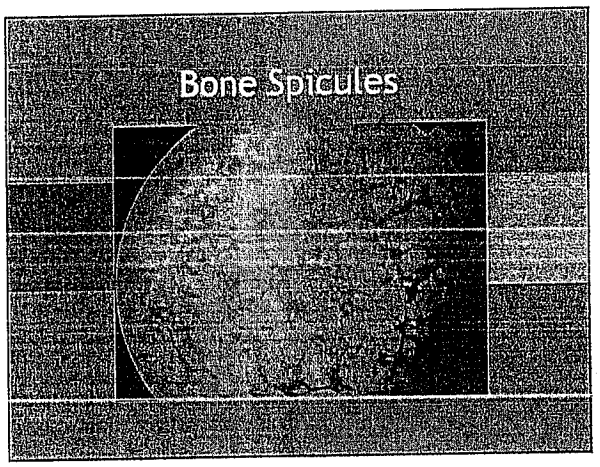

Pizza

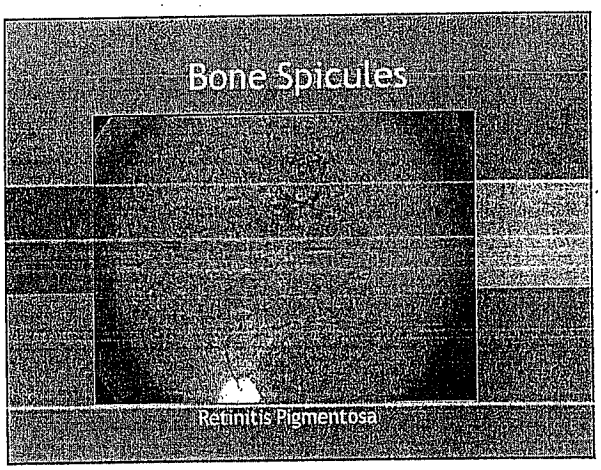

Pizza Pie
CMV Retinitis - "Pizza Pie" Retinopathy
Banker, A. Posterior segment manifestations of HIV. Int J Ophthalm 2008 56(5):377

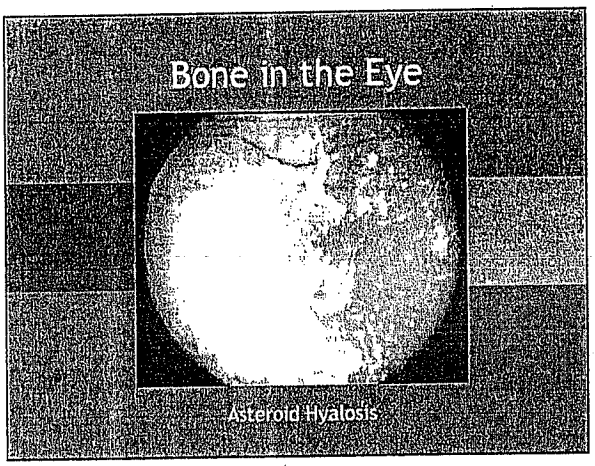

Bone

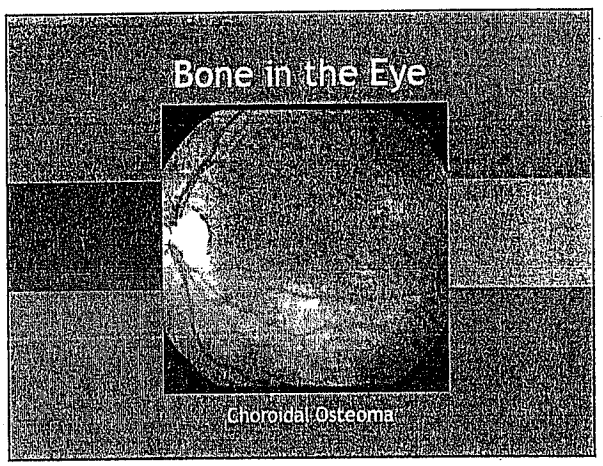

Bone Spicule

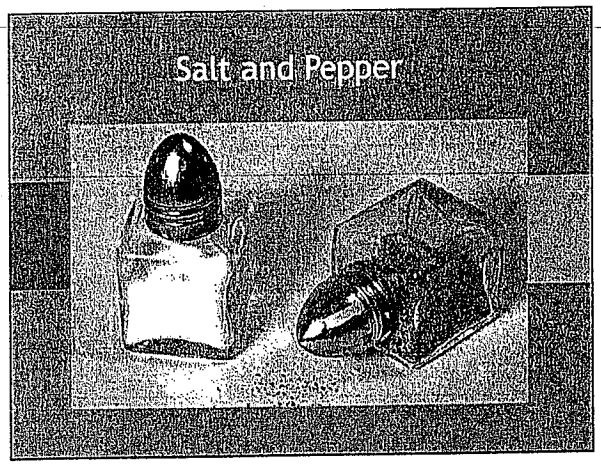

Bone Spicule
bone spicules
mesenchyme

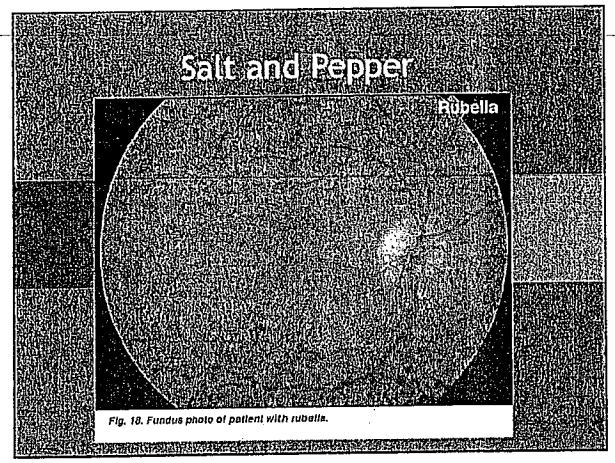

Bone Spicules

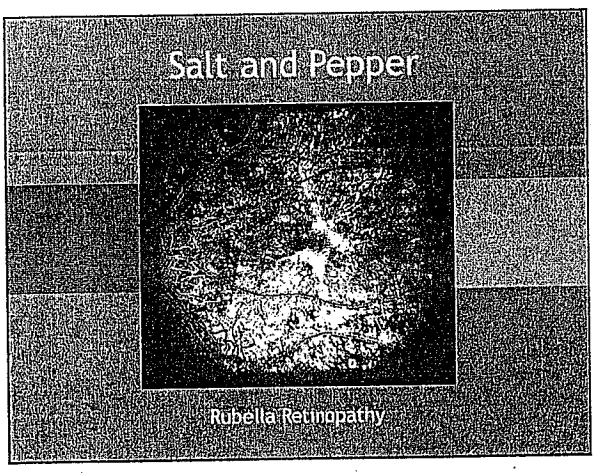

Bone Spicules
Retinitis Pigmentosa

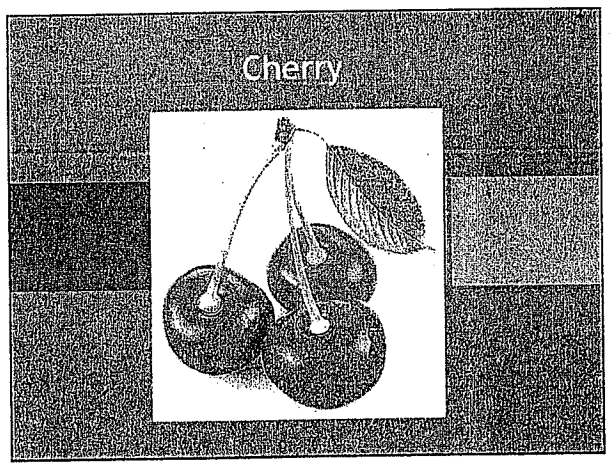

Bone in the Eye
Asteroid Hyalosis

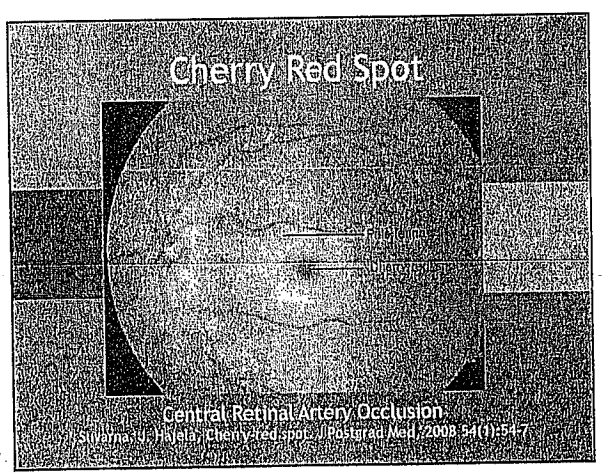

Bone in the Eye
Choroidal Osteoma

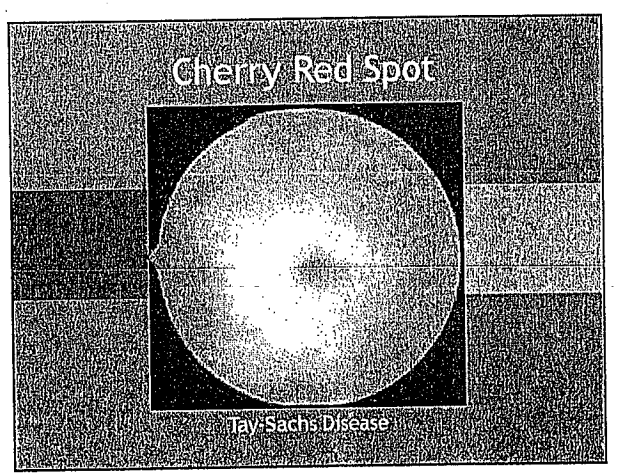

Salt and Pepper


Salt and Pepper
Rubella
Fig. 18. Fundus photo of patient with rubella.

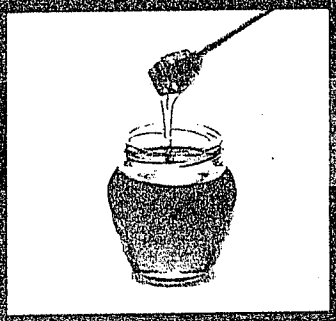

Salt and Pepper
Rubella Retinopathy


Cherry

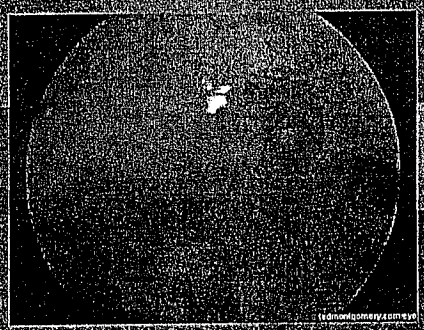

Cherry Red Spot
Central Retinal Artery Occlusion
Silvarna, J. Hajela, Cherry-red spot, J Postgrad Med, 2008 54(1):54-7


Cherry Red Spot
Tay-Sachs Disease

Honey

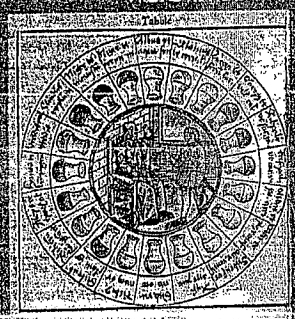


Diabetes mellitus = "Siphon Honey"



Diabetic Retinopathy from Diabetes Mellitus

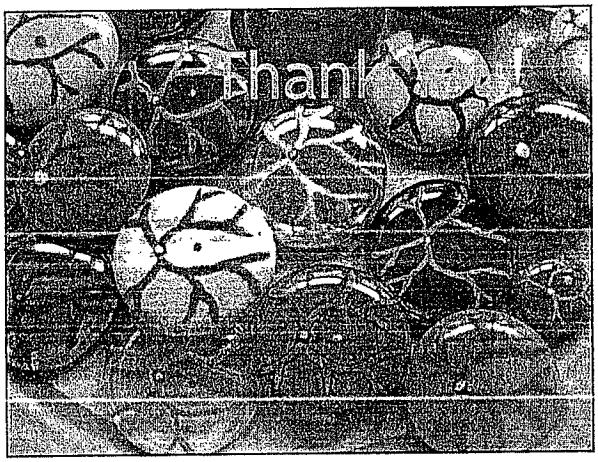
"The urine is wonderfully sweet, as if it were imbued with honey or sugar"



Thomas Willis
17th century English Doctor

Sanders, L. From Thebes to Toronto and the 21st Century: An Incredible Journey. Diabetes Spectrum. 2001; 15:56-60

Thank



CURRICULUM VITAE

TIMOTHY T. YOU, M.D.

Fellow, American Academy of Ophthalmology

Mailing/Contact Address:
Orange County Retina Medical Group
1200 North Tustin Avenue, Suite 140
Santa Ana, California 92705
714-972-8432

PROFESSIONAL PRACTICE AFFILIATIONS

Orange County Retina Medical Group
Physician/Surgeon/Partner
Since 3/1/2005

1200 North Tustin Avenue	Suite 140	Santa Ana, CA 92705	714-972-8432
1200 North Tustin Avenue	Suite 100	Santa Ana, CA 92705	714-972-8432
24022 Calle de la Plata	Suite 475	Laguna Hills, CA 92653	949-581-3618
320 Superior Avenue	Suite 160	Newport Beach, CA 92663	949-646-3242
333 W. Bastanchury Road	Suite 200	Fullerton, CA 92835	714-451-0801
31451 Rancho Viejo Road	Suite 101	San Juan Capistrano, CA 92675	949-496-0611

7/2002-2/2005 Rhode Island Eye Institute, Providence, Rhode Island
7/1999-6/2002 Pacific Clear Vision Institute, Eugene, Oregon

EDUCATION AND TRAINING

Vitreo-Retinal Fellowship
Massachusetts Eye and Ear Infirmary
Harvard Medical School, Boston, Massachusetts, 1997-1999
- Thomas Heed Ophthalmic Fellow, 1997-98
- American Ophthalmological Society, Herman Knapp Fellow, 1998-99

Research Fellowships
Penn Medical Scholars Anatomic Pathology Fellowship
Department of Pathology & Laboratory Medicine
Hospital of the University of Pennsylvania, 1991-1992

Children's Hospital of Los Angeles
University of Southern California, Doheny Eye Institute
Medical Student Fellowship in Pediatric Ophthalmology, 1989

Residency in Ophthalmology
Massachusetts Eye and Ear Infirmary
Harvard Medical School, Boston, Massachusetts, 1994-1997

Internship in Medicine
VA Medical Center, Sepulveda, California
University of California, Los Angeles, 1993-1994

Medical School
Medical Doctorate
University of Pennsylvania School of Medicine
University of Pennsylvania, Philadelphia, Pennsylvania, 1988-1993

Undergraduate Education
Bachelor of Science in Biology with distinction in major & *cum laude*
Yale College, New Haven, Connecticut, 1984-1988

Lab Assistant, Yale School of Medicine, Department of Microbiology, 1987

PROFESSIONAL POSITIONS

2013-Present	Clinical Rotation Preceptor, Southern California College of Ophthalmology, Fullerton, California
2012-Present	Preceptor and Site Coordinator, Western University Health Sciences, Pomona, California
2012-Present	Chief, Department of Ophthalmology, Children's Hospital of Orange County, Orange, California
2009-Present	Advisor, Clinical Institute , St. Joseph Hospital, Orange, California
2010-2012	Member, Planning Committee, Children's Hospital of Orange County Tower, Orange, California
2006-Present	Expert Witness, Medical Board of California
2005-Present	Medical Reviewer, MES Group
2003-2005	Assistant Clinical Professor in Ophthalmology, Brown Medical School, Providence, Rhode Island
2000-Present	Medical Reviewer, Advanced Medical Group
1997-1999	Assistant Staff, Massachusetts Eye and Ear Infirmary, Harvard Medical School, Boston, Massachusetts

MEDICAL LICENSES

American Board of Ophthalmology, Diplomate, (Board Certified) in 1999
Exam score 95th percentile

American Board of Ophthalmology, Diplomate, (Recertification) in 2009
Maintanence of Certification

Diplomat National Board of Medical Examiners, since 1994

Medical Board of California, since 1993

HOSPITAL AFFILIATIONS

3/1/2005 – Present	Anaheim Regional Medical Center, Anaheim, California
3/1/2005 – Present	Children's Hospital at Mission, Mission Viejo, California
3/1/2005 – Present	Children's Hospital of Orange County, Orange, California
3/1/2005 – Present	Hoag Memorial Hospital Presbyterian, Newport Beach, California
3/1/2005 – Present	St. Joseph Hospital, Orange, California
3/1/2005 – Present	Western Medical Center, Anaheim, California
3/1/2005 – Present	Western Medical Center, Santa Ana, California

HONORS AND AWARDS

2003	Brown Medical School Award for Excellence in Teaching
1999	Fellow of the Year for Massachusetts Eye and Ear for Excellence in Teaching
1999	Fellow Award at Paul Chandler Lecture for Resident Teaching
1997	STORZ Ophthalmic Instrument Design Contest for Modified Phaco-Chopper
1994-1991	Bill Raskob Foundation Award
1993	History of Medicine Prize, *The Stigma of Atomic Bomb Disease*
1992	History of Medicine Prize, *A Short History of Egyptian Military Ophthalmia*
1989	Whanki Essay Contest, *The Perfect Painting*, second place
1988	Summer Research Internship, Taejon Research Institute, South Korea
1985	Jostens' Scholarship
1985	Elks Club Western-Division Scholarship
1985	Soroptomist Club Scholarship
1985	Orange County Medical Association Scholarship
1984-1988	Mission Community Hospital Auxiliary Scholarship
1982-1984	American Academy of Sciences Junior Scientist, University of Southern California/University of California at Irvine

PROFESSIONAL SOCIETY MEMBERSHIPS

American Academy of Ophthalmology, Fellow
American Society of Retina Specialists (The Vitreous Society)
Association for Research in Vision and Ophthalmology
California Association of Eye Physicians and Surgeons
California Medical Association
California Scholarship Federation
Orange County Society of Ophthalmology
Orange County Medical Association
Oregon Medical Association
Society of Heed Fellows
Society of Penn Medical Scholars
Western Retina Study Club

CLINICAL RESEARCH

01. Genetech, Inc., Protocol #FVF2598g (Marina), Phase IIIb, 2003-2005
Sub-Investigator. *A multicenter, randomized, double masked, sham injection-controlled study of the safety and efficacy of rhuFab V2 in subjects with neovascular AMD who have minimally classic or occult lesion*

02. Eyetech Pharmaceuticals, Protocol #EOP1004, Phase II/III, 2005-2005
Sub-Investigator. *A randomized, double-masked, controlled, dose-ranging, multi-center comparative trial, in parallel groups, to establish safety and efficacy of intravitreal injections of EYE001 (anti-VEGF pegylated aptamer) in patients with exudative AMD*

03. Alcon Research, Ltd., Protocol C-01-99, Phase III, 2005-2005
Sub-Investigator. *A multicenter, double-masked, randomized, parallel groups study to demonstrate efficacy and safety of anecortave treatment relative to Visudyne for AMD.*

04. OxiGENE, Inc., Protocol MMD-213, Phase III, 2005-2006
Sub-Investigator. *A multi-center, randomized, double-masked, placebo-controlled, parallel group, evaluation of the safety and efficacy of combretastatin A4 phosphate infusion for treating subfoveal CNV in pathologic myopia.*

05. Diabetic Retinopathy Clinical Research Network(DRCR)/National Eye Institute, Protocol B, 2005-2009
Sub-Investigator. *A randomized trial comparing intravitreal corticosteroids and laser photocoagulation for DME.*

06. Alcon Research, Ltd., Protocol C-02-60 (AART), Phase III, 2005-2009
Sub-Investigator. *Anecortave Acetate Risk Reduction Trial (AART): An evaluation of efficacy and safety of posterior juxtascleral administrations of anecortave acetate for depot suspension (15 mg or 30 mg) versus sham administration in patients (enrolled in study "A" or study "B") at risk for developing sight-threatening CNV due to exudative AMD.*

07. National Eye Institute, SCORE, 2005-2009
Sub-Investigator. *The Standard Care vs. Corticosteroid for Retinal Vein Occlusion (SCORE): Two randomized trials to compare the efficacy and safety of intravitreal injection(s) of triamcinolone acetonide with standard care to treat macular edema: one for CRVO and one for BRVO.*

08. Lilly ICOS LLC, Protocol H6D-MC-LVGO, Phase IV, Collaborative Study, 2005-2006
Sub-Investigator. *A randomized, double-blind, parallel-design, placebo-controlled study to evaluate the effects of 5mg tadalafil (IC351, LY450190) and 50mg sildenafil administered once daily for 6 months on visual function in healthy subjects or subjects with mild erectile dysfunction.*

09. Alcon Research, Ltd., Protocol C0459 (IDEAA), Phase III, 2005-2007
Sub-Investigator. *A trial using anecortave acetate 15mg administered every 3 months versus anecortave acetate 15 mg every 6 months versus anecortave acetate 30 mg administered every 6 with exudative AMD.*

10. Eyetech Pharmaceuticals, Protocol EOP1012, Phase IV, 2005-2007
Sub-Investigator. *A randomized, active-controlled, double-masked, single dummy, multicenter comparative trial, in parallel groups, to compare the safety and efficacy of intravitreous injections of Macugen given every 6 weeks for up to 102 weeks, plus sham PDT, to Macugen plus PDT with Visudyne, in subjects with predominantly classic subfoveal CNV secondary to AMD.*

11. Novartis, Protocol CBPD952E2202 (Veritas), Phase IIIB, 2005-2007
Principal Investigator. *A 24-month randomized, double-masked, sham controlled, multicenter study comparing PDT with verteporfin (Visudyne) plus two different dose regimens of intravitreal triamcinolone acetonide (1 mg and 4 mg) versus Visudyne plus intravitreal pegaptnanib (Macugen) in patients with subfoveal CNV secondary to AMD.*

12. (OSI) Eyetech, Protocol EOP1023 (LEVEL), Phase IV, 2006-2008
Principal Investigator. *An open label, multicenter trial of maintenance intravitreous injections of Macugen (pegaptanib sodium) given every six weeks for 48 weeks in subjects with subfoveal neovascular AMD initially treated with a different modality resulting in maculopathy improvement.*

13. Novartis, Protocol #CBPD952A2308 (Denali), Phase IIIB, 2006-2010
Principal Investigator. *A 24-month randomized, double-masked, controlled, multicenter study assessing safety and efficacy of verteporfin (Visudyne) photodynamic therapy administered in conjunction with ranibizimub (Lucentis) versus ranibizumub (Lucentis) monotherapy in patients with subfoveal CNV secondary to AMD.*

14. Alimera Sciences, Protocol C-01-05-001 (FAME), Phase III, 2006-2011
Sub-Investigator. *Fluocinolone Acetonide in Diabetic Macular Edema (FAME): A randomized, double-masked, parallel group, multicenter, dose-finding comparison of the safety and efficacy of ASI-001A 0.5ug/day and ASI-001B 0.2 ug/day fluocinolone acetonide intravitreal inserts to sham injection in subjects with DME (Medidur®).*

15. Regeneron, Protocol VGFT-OD-0605 (VIEW 1), Phase III, 2006-2011
Sub-Investigator. *CLinical Evaluation of Anti-angiogenesis in the Retina - Intravitreal Trial 3 (CLEAR-IT 3): A randomized, double-masked, active-controlled phase III study of the efficacy, safety, and tolerability of repeated doses of intravitreal VEGF Trap in subjects with neovascular AMD.*

16. Opko, Protocol ACU-301 (COBALT), Phase III, 2007-2009
Sub-Investigator. *COmbining Bevasirinib and Lucentis Therapy (COBALT): A randomized, double-masked, parallel-assignment study of intravitreal bevasirinib sodium, administered every 8 to 12 weeks as maintenance therapy following three injections of Lucentis compared with Lucentis monotherapy every 4 weeks in patients with exudative AMD.*

17. Allergan, Protocol 206207-012, Phase III, 2007-2010
Sub-Investigator. *A 52-week, masked, multicenter, randomized, controlled trial (with up to 13 weeks additional follow-up) to assess the safety and efficacy of 700 ug dexamethasone posterior-segment drug delivery system (DEX PS DDS) Applicator System in combination with laser photocoagulation compared with laser photocoagulation alone in the treatment of subjects with diffuse DME.*

18. Vitreoretinal Technologies, Inc., Protocol PVD-301, Phase III, 2007-2010
Sub-Investigator. *A safety and efficacy study of Vitreosolve for ophthalmic intravitreal injection for inducing posterior vitreous detachment in subjects with NPDR.*

19. Merck & Co., Protocol 007-01 , Collaborative Study, 2008-2009
Ophthalmology Investigator. *A safety follow-up study of patients previously exposed to MK-0634 (a beta-3 receptor antagonist developed for the treatment of overactive bladder). Subjects had previously been enrolled in a multicenter, double-blind, randomized, placebo-controlled, parallel group, dose ranging study of L-000796568 in postmenopausal women with OAB.*

20. Allergan, Protocol 206207-019-00, Phase II , 2008-2010
Sub-Investigator. *A 26-week, open-label study to assess the safety and efficacy of 700 ug dexamethasone posterior segment drug delivery system applicator system in conjunction with Lucentis® in the treatment of patients CNV secondary to AMD.*

21. Ophthotech Corp., Protocol OPH3000, Phase I, 2008-2010
Sub-Investigator. *An ascending dose and parallel group trial to establish the safety, tolerability and pharmacokinetic profile of multiple intravitreous injections of volociximab ($\alpha5\beta1$ integrin antagonist) as monotherapy or in combination with Lucentis 0.5 mg/eye in subjects with neovascular AMD.*

22. Regeneron, Protocol VGFT-OD-0706 (Da Vinci), Phase III, 2008-2011
Sub-Investigator. *A double-masked, randomized, controlled study of the safety, tolerability and biological effect of repeated intravitreal administration of VEGF Trap-eye in patients with DME.*

23. NEI/Tufts Medical Center, The Family Study of Macular Degeneration, 2009-2010
The goal is to evaluate genetic and non-genetic risk factors for AMD

24. Allergan, Protocol 206207-018-00, Phase II, 2008 - 2010
Sub-Investigator. *A 26-week, open-label study to assess the safety and efficacy of 700 ug dexamethasone posterior segment drug delivery system applicator system in the treatment of vitrectomized subjects with DME.*

25. Grunenthal, Protocol KF0151Y/10, Phase IIb, Collaborative Study, 2009-2011
Sub-Investigator. *A randomized, multicenter, double-blind, parallel-group trial to assess the analgesic efficacy and safety of a new analgesic compared with placebo in subjects with painful diabetic peripheral neuropathy.*

26. Endo Pharmaceuticals, Protocol EN3324-201, Phase IIb, Collaborative Study, 2010-2011
Sub-Investigator. *A randomized, multicenter, double-blind, two-arm, multicenter, placebo-controlled study to assess the efficacy and safety of EN3324 (Axomadol) in subjects with moderate to severe chronic low back pain.*

27. GlaxoSmithKline, Protocol MD 7110852, Phase IIB, 2009-2012
Principal Investigator. *A dose-ranging study of pazopanib eye drops vs. ranibizumab intravitreal injections for the treatment of neovascular AMD.*

28. Genentech, Protocol FVF4579g (HARBOR), Phase III, 2009-2012
Sub-Investigator. *A double-masked, multicenter, randomized, active treatment-controlled study of the efficacy and safety of 0.5 mg and 2.0 mg ranibizumab administered monthly or on an as needed basis (PRN) in patients with subfoveal neovascular AMD.*

29. Lux Biosciences, Inc., Protocol LX211-11, Phase III, 2011-2013
Sub-Investigator. *A multicenter, double-masked, parallel group, placebo-controlled study to assess the efficacy and safety of Voclosporin as therapy in subjects with active noninfectious intermediate, posterior or pan-uveitis.*

30. Lpath, Protocol LT1009-Oph-003 (NEXUS), Phase IIA, 2011-Present
Sub-Investigator. *A multicenter, masked, randomized, comparator-controlled study evaluation Isonep™ (sonepcizumab [LT1009]) as either monotherapy or adjunctive therapy to Lucentis or Avastin versus Lucentis or Avastin alone for the treatment of subjects with choroidal neovascularization secondary to AMD.*

31. Alimera, Protocol C-01-11-008, Extension Study, 2011-2013
Sub-Investigator. *An open-label, multicenter, extension study of the safety and utility of the new inserter of Iluvien® (Fluocinolone Acetonide Intravitreal Insert) 0.19mg and the safety of Iluvien® in subjects with DME.*

32. EyeGate Pharmaceuticals, Protocol EGP-437-004, Phase III, 2012-2013
Sub-Investigator. *A prospective, multi-center, randomized, double-masked, positive controlled, clinical trial designed to evaluate the safety and efficacy of iontophoretic dexamethasone phosphate ophthalmic suspension (1%) in patients with non-infectious anterior segment uveitis*

33. Quark Pharmaceuticals, Protocol QRK202 (MATISSE), Phase II, 2012-2013
Sub-Investigator. *An open-label dose escalation study of PF-04523655 (Stratum I) combined with a prospective, randomized, double-masked, multi-center, controlled study (Stratum II) evaluating the efficacy and safety of PF-04523655 alone and in combination with ranibizumab versus ranibizumab alone in diabetic macular edema*

34. Xoma, Protocol X052130/CL3-78989-005, Phase III, 2012-Present
Principal Investigator. *A randomized, double-masked, placebo-controlled study of the safety and efficacy of gevokizumab in the treatement of active non-infectious intermediate, posterior, or pan-uveitis*

35. Pfizer, Protocol B1181003-1050, Phase II, 2012-2013
Sub-Investigator. *A phase 2, multi-center, randomized, double-masked, placebo-controlled, multi-dose study to investigate the efficacy, safety, pharmacokinetics and pharmacodynamics of RN6G (PF-04382923) in subjects with geographic atrophy secondary to age-related macular degeneration*

36. Xoma, Protocol X052131/CL3-78989-005 (EYEGUARD™ -C), Phase III, 2012-Present
Principal Investigator. *A randomized, double-masked, placebo-controlled study of the safety and efficacy of gevokizumab in the treatment of subjects with non-infectious intermediate, posterior, or pan- uveitis currently controlled with systemic treatment*

37. Regeneron Protocol VGFTe-AMD-1124 ((RE-VIEW), Phase IV, 2012-Present
Sub-Investigator. *Rigorous evaluation of vision and safety with intravitreal afliberecept injection dosed every 8 weeks over 2 years in neovascular AMD*

38. Merck Protocol MK8931—017 (SCH 900931, P07738), Phase 2/3, Collaborative Study, 2012-Present
Ophthalmology Investigator. *A randomized, placebo controlled, parallel-group, double blind efficacy and safety trial of MK-8931 in subjects with mild to moderate Alzheimer's disease*

39. Ophthotech OPH1003, Phase III, 2013-Present
Sub-Investigator. *A randomized, double-masked, controlled trial to establish the safety and efficacy of intravitreous administration of Fovista ™ (Anti-PDGF-B pegylated aptamer) administered in combination with Lucentis® compared to Lucentis® monotherapy in subjects with subfoveal neovascular macular degeneration*

ABSTRACTS

01. Wong CG, **You TT**, Ghosen C, Ton L, You L, Burke J, Wheeler L. *Experimental CNV in Cynomologous Monkey after Sustained Release of VEGF & bFGF within the Suprachoroidal Space.* Association for Research in Vision and Ophthalmology Meeting; May 2011. Abstract

02. Wong CG, **You TT**, Carvalho RAP. Natural history of progressive experimental CNV in the rabbit after sustained release of both VEGF and bFGF within the supra-choroidal space. Association for Research in Vision and Ophthalmology Meeting, May 2009. Abstract

03. Wong CG, Bruice TC, **You TT**. Experimental CNV after transcleral implantation of VEGF/bFGF-implant within the suprachoroidal space for defining potential long-term synergistic actions of ranibizumab (Lucentis) with small low-cost molecules in ameliorating wet AMD. Association for Research in Vision and Ophthalmology Meeting, May 2008. Abstract

04. **You TT**, Wong CG, Fedoruk T, Bonakdar M. Comparison of Lucentis and Avastin in the suprachoridal VEGF/bFGF-implant rabbit CNV model provides a potential standardized pre-clinical approach in the rational development of more effective QSAR-based drugs, sustained release formulations, and drug delivery systems for ameliorating AMD. Association for Research in Vision and Ophthalmology Meeting, 2007. Abstract

05. Gupta G, Donahue JP, Andorsky S, **You TT**. Profile of the retina by optical coherence tomography in the pediatric age group. Association for Research in Vision and Ophthalmology, Ft. Lauderdale, Florida; May 1, 2005. Abstract

06. Gupta G, and **You T**. Vitreous Hemorrhage in age-related macular degeneration. New England Ophthalmological Society, Boston, Massachusetts; May 2004. Abstract

07. **You TT** and Itturiaga J. "The Range of Abnormalities in *Drosophila* 1(1)ts-726 after High Temperature Shock Treatments." California Academy of Science Meeting, Los Angeles, California; 1984. Abstract

08. **You T** and Itturiaga J. "Variations in Bristle Pattern After High Temperature Treatment in *Drosophila melanogaster*." American Academy of Science Meeting, New York, New York; 1984. Abstract

PAPERS AND PUBLICATIONS

01. **You TT**, Youn DW, Chen S, Alexandrescu B, Casiano ME, Maggiano JM. Intraocular penetration by acupuncture needle. (submitted for publication, *Retina*)

02. Ambati J, Gragoudas ES, Miller JW, **You TT**, Miyamoto K, Delori FC, Adamis AP. Transscleral delivery of bioactive protein to the choroid and retina. *Invest Ophthalmol Vis Sci* 2000 Apr; 41(5):1186-91.

03. Arroyo JG, **You TT**, Bossi KE. Illuminated lens fixator for bimanual pars plana lensectomy. *Ophthalmic Surg Lasers* 2001 Sep-Oct;32(5):438-40.

04. Rumeldt S, **You TT**, Remulla HD, Rubin PAD, Jakobiec FA. Prepartum mixed type cavernous-capillary hemangioma arising in nevus flammeus. *Ophthalmology* 1999;106:1219-22.

05. **You TT** and Power W. Choroidal detachments and uveal effusion syndrome. In: *Principles and Praxis of Ophthalmology* Vol. 2. Albert DM & Jacobiec F (eds). Saunders. Philadelphia. 1999;1338-1351.

06. **You TT** and JG. Arroyo. Surgical approaches to managing the dislocated crystalline lens. *Int Ophthalmol Clinics* 1999;39:1-12.

07. **You TT** and Kaiser PK, Netland PA, Jakobiec FA. Neurothekeoma palpebrae: a rare nerve sheath tumor arising in the eyelid. *Ophthal Plast Reconstr Surg*. 1999;6:448-9.

08. **You TT** and Young LHY. Retinal manifestations of gastrointestinal disorders. *Int Ophthalmol Clinics* 1998;38:197-220.

09. **You TT**, et al. Corneal Abrasion Patching Study Group. A study of topical nonsteroidal anti-inflammatory drops and no pressure patching in the treatment of corneal abrasions. *Ophthalmol 1997;* 104: 1353-59.

10. **You, TT** and Pavan-Langston D. Chronic unilateral keratitis in a young man. *Dig J Ophthalmol* 1995 October 25;Vol. 1. Issue 2.

11. **You, TT** and Dohlman CH. Progressive corneal opacification and arthropathy. *Dig J Ophthalmol* 1995 August 12;Vol. 1, Issue 1.

12. **You TT**, Choi JC, Partington MA, Whitaker LA, Shore JW. "Ophthalmic Findings Associated with Unilateral Non-compensational Plagiocephaly." Association for Research in Vision and Ophthalmology, Fort Lauderdale, Florida; 1995. Abstract

13. **You, TT** and Pavan-Langston D. Immune reactions in corneal herpetic disease. *Int Ophthalmol Clinics* 1996;36: 31-39.

14. Menzin AW, **You TT**, Deger RB, J.J. Brooks, S.A. King. Sarcoidosis in a uterine leiomyoma. *Int J Gynaecol Obstet 1995;*48: 79-84.

15. Trojanowski JQ, Mantione JR, Lee JH, Seid DP, **You TT**, Inge LJ, Lee VMY. Neurons derived from a human teratocarcinoma cell line establish molecular and structural polarity following transplantation into the rodent brain. *Exp Neurology* 1993;122: 283-94.

POSTERS & PRESENTATIONS

01. *Updates in Retina Care: Macular Degeneration and Implantable Miniature Telescope*
Course Director. Retina Care Symposium, Costa Mesa, California; December 5, 2013.

02. *Healthcare*
Invited speaker. Third Annual Yorba Linda High School Career Day, Yorba Linda, CA; November 13, 2013.

03. *Updates in Macular Degeneration*
Invited speaker (JCAPHO). South Coast Eye Center, Laguna Hills, California; November 8, 2013.

04. *Cataract Surgery: Retinal Perils, Risks* and Complications.
Invited speaker. NVision Centers, Costa Mesa, California; August 22, 2013.

05. *Retinopathy of Prematurity and Eye Care for Infants*
Invited speaker. Anaheim Regional Medical Center, Anaheim, California; February 21, 2013.

06. *Healthcare*
Invited speaker. Second Annual Yorba Linda High School Career Day, California; November 1, 2012.

07. *Iontopheretic Dexamethasone Phosphate Ophthalmic Suspension in Patients with Non-Infectious Anterior Segment Uveitis: Phase III Data*. Anaheim, California; October 3, 2012.

08. *Updates in Age-Related Macular Degeneration*
Invited speaker. Forest Home Conference Center, Forest Falls, California; July 5, 2012.

09. *Update on Retinal Venocclusive Diseases*
Guest speaker (JCAPHO). South Coast Eye Medical Centers, Laguna Hills, California; March 9, 2012.

10. *Healthcare*
Invited speaker. First Annual Yorba Linda High School Career Day, California; November 8, 2011.

11. *Management of Ophthalmic Emergencies*
Invited speaker. Forest Home Conference Center, Forest Falls, California; July 5, 2011.

12. *Retinal Disease Management*
Invited Speaker, Fuentes de Gracia Hospital Grand Rounds. Chimaltenango, Guatemala; March 2011.

13. *Diabetes and the Eye*
Invited Speaker. St. Joseph's Hospital, Orange, California; February 26, 2011.

14. *Overcoming Retina Hurdles to 20/20 Vision for Your Patients*
Invited Speaker. Orange County Optometric Society, Western Medical Center, California; August 8, 2010

15. *Diabetes and the Eye*
Invited Speaker. St. Joseph's Diabetes Day Conference, St. Joseph Medical Center, Orange, California; February 26, 2010.

16. *Retinopathy of Prematurity and Other Ocular Anomolies*
Invited Speaker. Anaheim Regional Medical Center, Anaheim, California; October 27, 2009.

17. Co-Moderator, Day of Ophthalmology. St. Joseph's Hospital, Orange, California; October 3, 2009.

18. *Retinopathy of Prematurity and Neonatal Eye Diseases*
Invited Speaker. Children's Hospital of Orange at Mission Viejo, California; September 28, 2009.

19. *Retinopathy of Prematurity and Neonatal Eye Diseases*
Invited Speaker. Department of Neonatology, Childrens' Hospital of Orange County, California; July 13, 2009.

20. *Updates in Ophthalmic Care*
Invited Speaker, Fuentes de Gracia Hospital Grand Rounds, Chimaltenango, Guatemala; July 2009.

21. *Updates on New Treatment for Retinal Diseases*
Invited Speaker. TLC Annual Symposium, Anaheim, California; June 7, 2009.

22. *Macular Degeneration*
Invited Speaker, Foundation for Fighting Blindness. Low Vision Symposium, Southern California College of Optometry, Fullerton, California; May 9, 2009.

23. *The Refractive Surgery Retinal Evaluation: Pearls and Pitfalls*
Invited Speaker. TLC, Newport Beach, California; April 22, 2009.

24. *Retinal Disease Update*
Invited Speaker. Fuentes de Gracia Hospital Grand Rounds, Chimaltenango, Guatemala. August 8, 2008.

25. *Emerging Treatment Strategies for Exudative AMD.*
Novartis Speaker Program. Costa Mesa, California; March 12, 2008.

26. *Emerging Treatment Strategies for Exudative AMD.*
Novartis Speaker Program. Newport Beach, California; February 20 2008.

27. *Retinopathy of Prematurity and Other Ocular Anomalies*
Invited Speaker. Children's Hospital of Orange at Mission. Mission Viejo, California; February 20, 2007.

28. *Toxoplasma Uveitis*
Invited Speaker, Continuing Medical Education Lecture. Children's Hospital of Orange County, Orange, California; October 23. 2006

29. *Retinopathy of Prematurity*
Invited Speaker. Anaheim Regional Medical Center, Anaheim, California; March 14, 2006.

30. *Retinopathy of Prematurity and Neonatal Eye Diseases*
Invited Speaker. Hoag Presbyterian Hospital, Newport Beach, California; July 12, 2005.

31. *The Great Debates: Controversies in Retinal Disease 2005*
Invited Speaker, Medical Education Seminar. University of California, Irvine, Beckman Laser Center, Irvine, California; March 26, 2005.

32. *Pediatrics Case Conference*
Invited Speaker. Rhode Island Hospital, Providence, Rhode Island; January 20, 2003.

33. *Advances in Retina*
Rhode Island Eye Institute, Providence, Rhode Island; 2002.

34. *Posterior Segment*
Posterior Segment Rounds. Central Oregon Optometric Association, Redmond, Oregon: 2001.

35. *Medicine 2000*
Oregon Society of Medical Assisting Conference, Eugene. Oregon; 2000.

36. *Retinal Diagnoses*
Pacific Northwest Conference, Bend, Oregon; 2000.

37. *Retinal Surgery throughout the Ages*
Lane County Optometric Society Meeting, Eugene. Oregon; 1999.

38. **You TT** and Arroyo JG. Surgical approaches to dislocated lenses. Annual Fellows' Conference, Massachusetts Eye & Ear Infirmary, Boston, Massachusetts; 1998.

39. **You TT** and Young LHY. "Retinal Manifestations of Gastrointestinal Disorders." Biennial Residents' Conference. Massachusetts Eye & Ear Infirmary, Boston, Massachusetts;1997.

40. **You TT**, R.N. Hogan, C.S. Foster, C.H. Dohlman. "Corneal Injury in Stevens-Johnson Syndrome." Contact Lens Association of Ophthalmologists Meeting, Las Vegas, Nevada; 1997. Poster

41. **You TT**, Hogan RN, Yuhan KR, Foster CS, C.H. Dohlman. "A Clinicohistopathologic Study of Cornea in Erythema Multiforme Major." Academy of Ophthalmology Meeting, Chicago, Illinois; 1996. Poster

42. **You TT**, Hogan RN, Foster CS, Dohlman CH. "Keratopathy in Stevens-Johnson Syndrome: Histopathologic Study of Diseased Cornea." Association for Research in Vision and Ophthalmology, Fort Lauderdale, Florida; 1996. Poster

43. **You TT** and Pavan-Langston D. "Sterile Inflammatory Reactions in Herpes Keratitis." Biennial Residents' Day Conference. Massachusetts Eye & Ear Infirmary, Boston, Massachusetts; 1995.

44. Navon S, **You TT**, Chynn EW. "Eye Examination." NPACE Skills Building Seminar, Framingham, Massachusetts; 1995.

45. *Cognitive Decision Making - A Computer Based Model*
Society of General Internal Medicine Meeting, Washington. DC; 1994.

46. **You TT**, Partington MA, Whitaker LA. "Congenital Torticollis and Plagiocephaly: Clinically Frequent Association." 51st American Cleft Palate and Craniofacial Association Conference, Toronto, Canada; 1994.

47. *Bacterial Utilization of Dissolved Organic Matter in a Natural, Oligotrophic Aquatic System*
California Academy of Science Meeting, Los Angeles, California; 1981.

CALIFORNIA STATE BOARD OF OPTOMETRY

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Continuing Education Course Approval Checklist

Title: Idiopathic Orbital Inflammatory Syndrome
Provider Name: John Lee

☒Completed Application
- Open to all optometrists? ☒Yes ☐No
- Maintain record agreement? ☒Yes ☐No

☐Detailed Course Description
☒PowerPoint and/or other presentation materials
☐Advertising (optional)
☒CV for EACH course instructor
☒License Verification for each course instructor
- Disciplinary History? ☐Yes ☒No

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CONTINUING EDUCATION COURSE APPROVAL APPLICATION

$50 Mandatory

Pursuant to California Code of Regulations (CCR) § 1536, the Board will approve continuing education (CE) courses after receiving the applicable fee, the requested information below and it has been determined that the course meets criteria specified in CCR § 1536(g).

In addition to the information requested below, please attach a copy of the course schedule and topical outline of the subject matter. Applications must be submitted 45 days prior to the course presentation date.

Please type or print clearly.

Course Title	Course Presentation Date
Idiopathic orbital inflammatory syndrome	05/15/2016

Course Provider Contact Information

Provider Name

John (First) Lee (Last) H (Middle)

Provider Mailing Address

Street 2575 Yorba Linda Blvd City Fullerton State CA Zip 92831

Provider Email Address jlee@ketchum.edu

Will the proposed course be open to all California licensed optometrists?	☒ YES ☐ NO
Do you agree to maintain and furnish to the Board and/or attending licensee such records of course content and attendance as the Board requires, for a period of at least three years from the date of course presentation?	☒ YES ☐ NO

Course Instructor Information

Please provide the information below and attach the curriculum vitae for each instructor or lecturer involved in the course. If there are more instructors in the course, please provide the requested information on a separate sheet of paper.

Instructor Name

Munish (First) Sharma (Last) (Middle)

License Number 14962TLG	**License Type** Optometry
Phone Number (909) 469-8486	**Email Address** sharmam@westernu.edu

I declare under penalty of perjury under the laws of the State of California that all the information submitted on this form and on any accompanying attachments submitted is true and correct.

Signature of Course Provider 4/1/2016 *Date*

AAOS

ASIAN AMERICAN OPTOMETRIC SOCIETY
PRESENTS

2016 May Honors Symposium

Sunday, May 15, 2016
FEATURING 5 HOURS OF CONTINUING EDUCATION

Agenda:

9:00am – 9:10am	**Welcome** Jason Lam, OD, MBA President, AAOS
9:10am – 10:50am (2 Hours CE)	**Decision Making in Glaucoma** Pinakin Davey, OD Western University of Health Sciences
10:50am – 11:10am *(20 min)*	*Break*
11:10am – 12:00pm (1 Hour CE)	**Idiopathic Orbital Inflammatory Syndrome** Munish Sharma, MD, OD Western University of Health Sciences
12:00pm – 1:00pm *(60 min)*	*Lunch*
1:00pm – 1:50pm (1 Hour CE)	**Culinary Guide to Ophthalmic Diseases** Timothy You, MD Orange County Retina
1:50pm – 2:40pm (1 Hour CE)	**Retinal Toxicity of Systemic Medications** Rajiv Rathod, MD, MBA Orange County Retina

NJSOP Society of Optometric Physicians

OMNI EYE SERVICES OF NJ & NJSOP

BILATERAL PROPTOSIS

MUNISH SHARMA, OD, MD

NJSOP Society of Optometric Physicians

CASE

FOLLOWED BY

LITERATURE UPDATES

NJSOP Society of Optometric Physicians

HISTORY

* 57 YO HISPANIC MALE FOR PROPTOSIS OU
* PAINLESS SLOWLY PROGRESSIVE FOR 9 MONTHS
* ASSOCIATED INTERMITTENT TEARING
* NO OTHER RELEVANT OCULAR AND SYSTEMIC SYMPTOMS
* HO SEASONAL ALLERGIES ASTHMA WELL CONTROLLED WITH LEVOCETIRIZINE AND PROAIR
* HO HYPERLIPIDEMIA WELL CONTROLLED WITH CRESTOR

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EXAMINATION

* BCVA OD: 20/20
  OS: 20/20
* GOLDMANN APPLANATION PRESSURE 14/14 @9:43 AM

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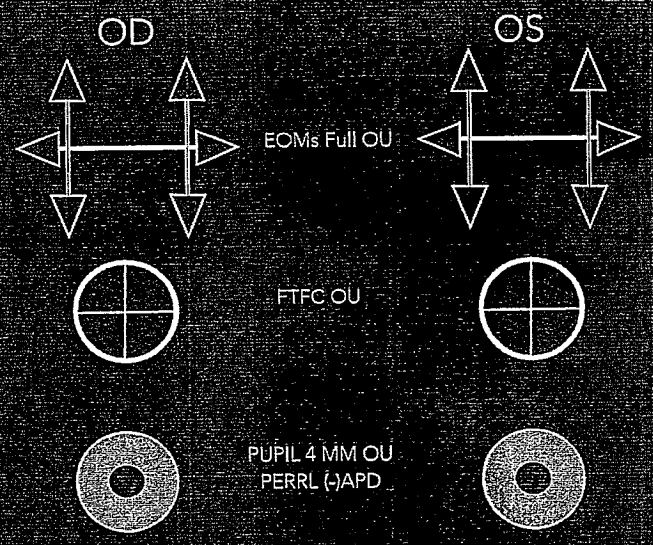
EXAMINATION



EXTERNALS

EXTERNALS

* OU MILD PTOSIS UL/LAXITY LL , LID MARGINS ARE QUIET
  EXOPHTHALMOMETRY: BASE: 100 OD 27 OS 27
* CONJUNGTIVA: DIFFUSE CHEMOSIS TEMPORAL>NASAL OU
* COLOR VISION OD 14/14 OS 14/14 ISHIHARA

EXTERNALS

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PLASTY W/U LIDS

Brow position:
OD brow position normal
OS brow position normal
Punctae:
RUL normal **RLL** normal
LUL normal **LLL** normal
Upper lids:
Levator function: OD 15mm **OS** 15mm
Lid crease: OD 8mm **OS** 8mm
Margin reflex distance 1: OD 3mm **OS** 3mm
Orbicularis function: OD 4+ **OS** 4+
Palpebral fissure: OD 10mm **OS** 10mm
Spasm: OD 0 **OS** 0

Lower Lids:
Orbicularis function: OD 4+ **OS** 4+
Margin reflex distance 2: OD 7mm **OS** 7mm
Scleral show: OD 2mm **OS** 2mm
Snapback: OD good **OS** good
Spasm: OD 0 **OS** 0
Brow:
Brow elevation: OD good **OS** good
Brow ptosis: OD none **OS** none
Herniated orbital fat:
RUL 0/0 **RLL** 0/0/0
LUL 0/0 **LLL** 0/0/0

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PLASTY W/U LIDS

Other:
Bell's: OD good **OS** good
Chin up: OD -ve **OS** -ve
Cogan's lid twitch: OD -ve **OS** -ve
Corneal sensation: OD 4+ **OS** 4+
Downgaze retraction: OD -ve **OS** -ve
Fatigue test: OD -ve **OS** -ve
Lagophthalmos: OD 0 **OS** 0
Lateral canthus laxity: OD no **OS** no
Lid lag: OD -ve **OS** -ve
Medial canthus laxity: OD no **OS** no
Orbic strength: OD good **OS** good

Sensation V1: OD normal **OS** normal
Sensation V2: OD normal **OS** normal
Sensation V3: OD normal **OS** normal
Spasm mid-face: Right 0 **Left** 0

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PLASTY W/U LACRIMALS

Puncta:
RUL normal **RLL** normal
LUL normal **LLL** normal
Canaliculus:
RUL patent **RLL** patent
LUL patent **LLL** patent
Nasal:
OD normal **OS** normal
Sac:
OD flat **OS** flat

Lower lid tone:
OD normal **OS** normal
Tear film:
OD normal **OS** normal
Tear function tests:
Dye disappearance test:
OD normal **OS** normal
Tear break-up time:
OD normal **OS** normal

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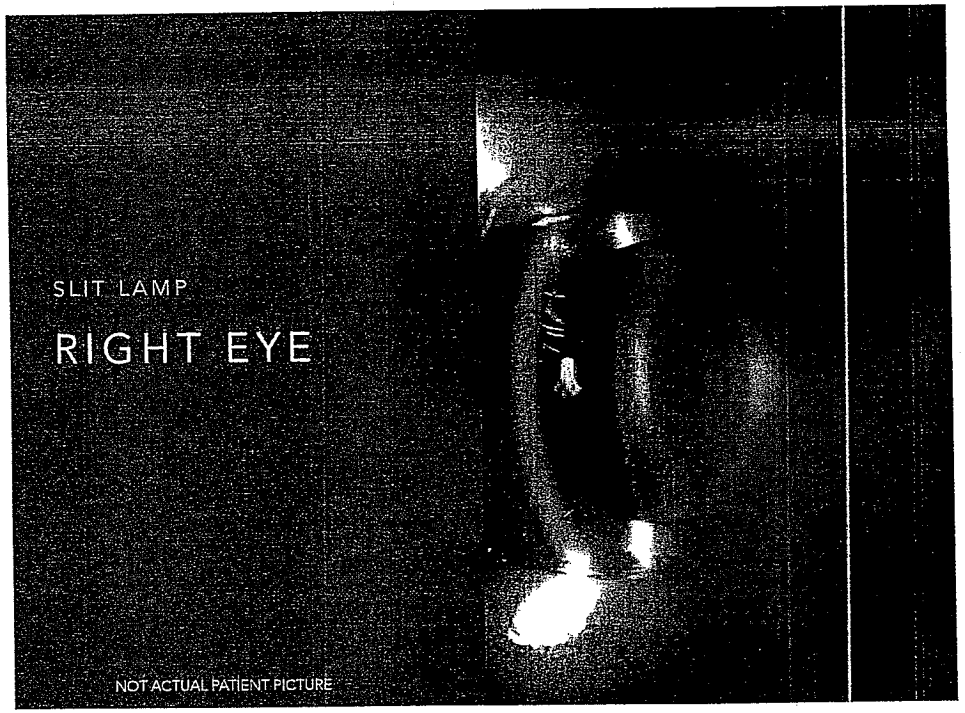
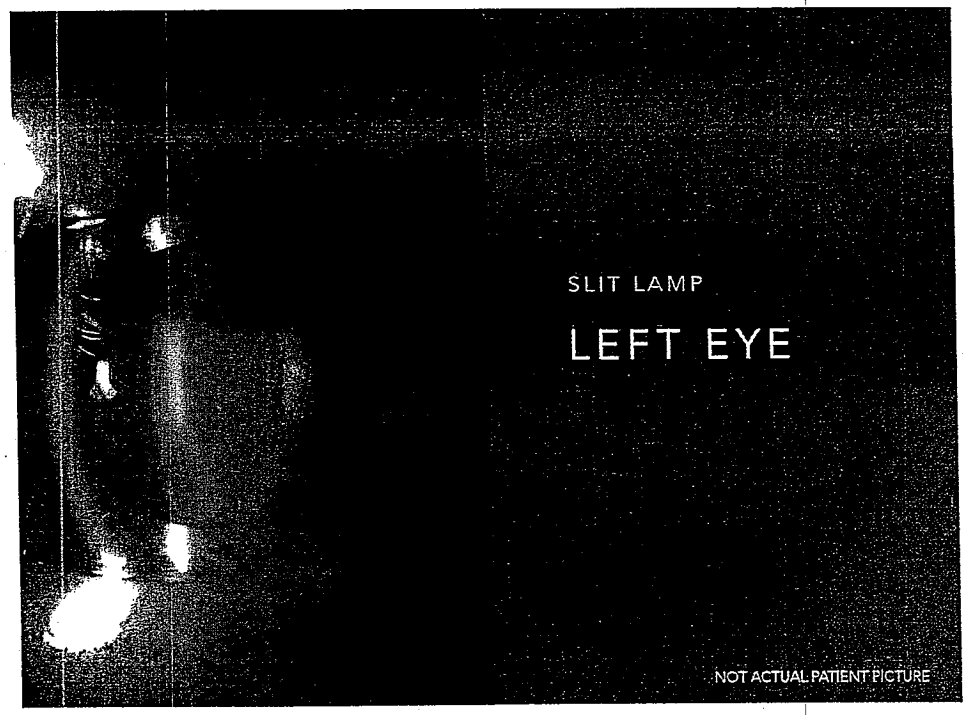
PLASTY W/U ORBIT

Orbit:
Bruit:
OD negative
OS negative
Dependent head position:
OD no change
OS no change

Orbital rim:
OD normal
OS normal
Globe position:
OD no masses
OS no masses
Retropulsion
OD Soft **OS** Soft





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EXAMINATION

- **VITREOUS**
  - **OD** CLEAR
  - **OS** CLEAR
- **OPTIC NERVE**
  - **OD** C:D 040 FLAT, SHARP, GOOD COLOR
  - **OS** C:D 0.40 FLAT, SHARP, GOOD COLOR
- **MACULA**
  - **OD** FR (+) FLAT INTACT
  - **OS** FR (+) FLAT INTACT
- **PERIPHERY**
  - **OD** FLAT ATTACHED WITH NO BREAKS
  - **OS** FLAT ATTACHED WITH NO BREAKS

WHAT SHOULD WE DO NEXT ?

Blood Work

–THYROID PANEL

Test Name	In Range	Out of Range	Reference Range	Lab
THYROID PANEL + TSH				
TSH	3.56		0.40-4.50 mIU/L	TBR
THYROID PANEL				TBR
T4,TOTAL	6.9		4.5-12.0 mcg/dL	
T3 UPTAKE	31		22-35 Percent	
T4,FREE,CALCULATED	2.0		1.4-3.8 Units	

ALL NORMAL

Performing Laboratory Information:

TBR Quest Diagnostics Inc Nichols Institute Diagnostics 32 [illegible] Laboratory [illegible] Dana [illegible] NJ

Blood Work

–CBC/ DIFF

RBC	4.73		x10E6/uL	4.14-5.80
Hemoglobin	13.4		g/dL	12.6-17.7
Hematocrit	40.6		%	37.5-51.0
MCV	86		fL	79-97
MCH	28.3		pg	26.6-33.0
MCHC	33.0		g/dL	31.5-35.7
RDW	14.3		%	12.3-15.4
Platelets	234		x10E3/uL	140-415
Neutrophils	40		%	40-74
Lymphs	30		%	14-46
Monocytes	9		%	4-13
Eos	21	H	%	0-7
Basos	0		%	0-3
Neutrophils (Absolute)	3.2		x10E3/uL	1.8-7.8
Lymphs (Absolute)	2.4		x10E3/uL	0.7-4.5
Monocytes(Absolute)	0.7		x10E3/uL	0.1-1.0
Eos (Absolute)	1.7	H	x10E3/uL	0.0-0.4

HIGH EOSINOPHILS

Blood Work

–UPPER RESP ALLERGY

Upper Respiratory Allergy			
Cat Dander IgE	<0.10	kU/L	<0.35
Class Interpretation	0		
Dog Dander IgE	<0.10	kU/L	<0.35
Class Interpretation	0		
Bermuda Grass IgE	<0.10	kU/L	<0.35
Class Interpretation	0		
Johnson Grass IgE	<0.10	kU/L	<0.35
Class Interpretation	0		
June Grass/Kentucky Blue IgE	<0.10	kU/L	<0.35
Class Interpretation	0		
Marshelder Rough IgE	<0.10	kU/L	<0.35
Class Interpretation	0		
Ragweed Short/Common IgE	0.15	kU/L	<0.35
Class Interpretation	0/1		
Cedar Mountain IgE	<0.10	kU/L	<0.35
Class Interpretation	0		
Elm American IgE	<0.10	kU/L	<0.35
Class Interpretation	0		
Oak Live IgE*	<0.10	kU/L	<0.35
Class Interpretation	0		
Walnut California Tree IgE	<0.10	kU/L	<0.35
Class Interpretation	0		
Alternaria tenuis/alternat IgE	<0.10	kU/L	<0.35
Class Interpretation	0		
Cladosporium IgE	<0.10	kU/L	<0.35
Class Interpretation	0		
Mite D. farinae IgE	<0.10	kU/L	<0.35
Class Interpretation	0		
Cockroach German IgE	<0.10	kU/L	<0.35

ALL NORMAL

Blood Work

–CMP

Comp. Metabolic Panel (14)				
Glucose, Serum	95		mg/dL	65-99
BUN	19		mg/dL	6-24
Creatinine, Serum	1.07		mg/dL	0.76-1.27
eGFR If NonAfricn Am	77		mL/min/1.73	>59
eGFR If Africn Am	89		mL/min/1.73	>59
BUN/Creatinine Ratio	18			9-20
Sodium, Serum	138		mmol/L	134-144
Potassium, Serum	4.3		mmol/L	3.5-5.2
Chloride, Serum	103		mmol/L	97-108
Carbon Dioxide, Total	24		mmol/L	20-32
	Please note reference interval change			
Calcium, Serum	8.8		mg/dL	8.7-10.2
Protein, Total, Serum	7.5		g/dL	6.0-8.5
Albumin, Serum	3.8		g/dL	3.5-5.5
Globulin, Total	3.7		g/dL	1.5-4.5
A/G Ratio	1.0	L		1.1-2.5
Bilirubin, Total	0.4		mg/dL	0.0-1.2
Alkaline Phosphatase, S	59		IU/L	25-150
AST (SGOT)	15		IU/L	0-40
ALT (SGPT)	21		IU/L	0-44
Lipid Panel				
Cholesterol, Total	155		mg/dL	100-199
Triglycerides	137		mg/dL	0-149
HDL Cholesterol	31	L	mg/dL	>39
Comment				
According to ATP-III Guidelines, HDL-C >59 mg/dL is considered a negative risk factor for CHD.				
VLDL Cholesterol Cal	27		mg/dL	5-40
LDL Cholesterol Calc	97		mg/dL	0-99
Hemoglobin A1c				
Hemoglobin A1c	6.1	H	%	4.8-5.6

LOW HDL & A/G RATIO

HIGH A1C

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MRI REPORT BUT NO SCANS

- EXAM: MR ORBITS WITHOUT CONTRAST
- CLINICAL INDICATION: BILATERAL EXOPHTHALMOS.
- TECHNIQUE: MRI ORBIT PROTOCOL WITHOUT CONTRAST. NO PERTINENT PRIOR STUDIES HAVE BEEN SUBMITTED FOR COMPARISON.

- FINDINGS:
  - PROPTOSIS BILATERALLY: NORMAL SYMMETRIC CONTOUR BILATERAL GLOBES.
  - THE OPTIC NERVES, OPTIC CHIASM AND OPTIC NERVE TRACTS APPEAR NORMAL.
  - ABNORMAL ENLARGEMENT OF THE BILATERAL LACRIMAL GLANDS. ABNORMAL ENLARGEMENT OF THE BILATERAL LATERAL AND INFERIOR RECTUS AND TO LESSER EXTENT SUPERIOR RECTUS MUSCLES.
  - SOME OF THESE FINDINGS MAY BE DUE TO THYROID EYE DISEASE COMBINATION OF FINDINGS AND ENLARGEMENT OF THE LACRIMAL GLANDS RAISES THE SUSPICION OF LYMPHOMA.
  - POST GADOLINIUM IMAGING IS ADVISED TO FURTHER EVALUATE.
  - A LIMITED VIEW OF THE BRAIN PARENCHYMA APPEARS NORMAL.
  - THERE IS MUCOSAL THICKENING IN THE BILATERAL ETHMOID, SPHENOID AND MAXILLARY SINUSES.
  - RECOMMEND CORRELATION WITH PATIENT CLINICAL HISTORY AND SYMPTOMS

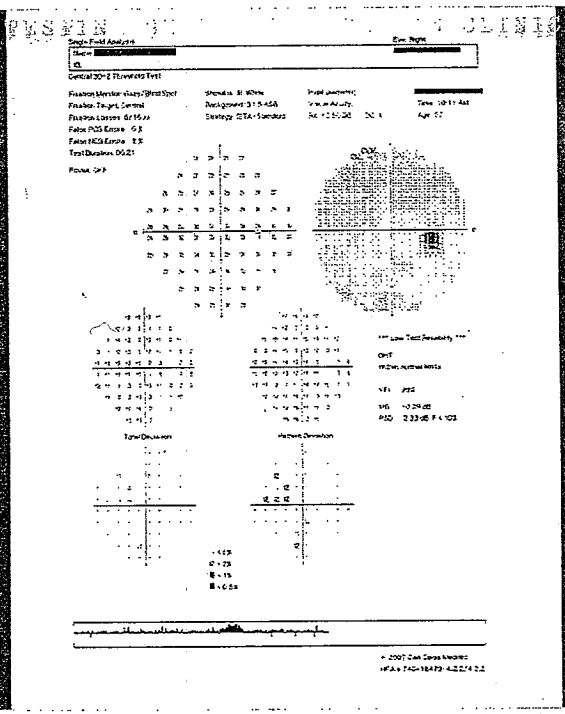
IS THYROID PANEL COMPLETE ?

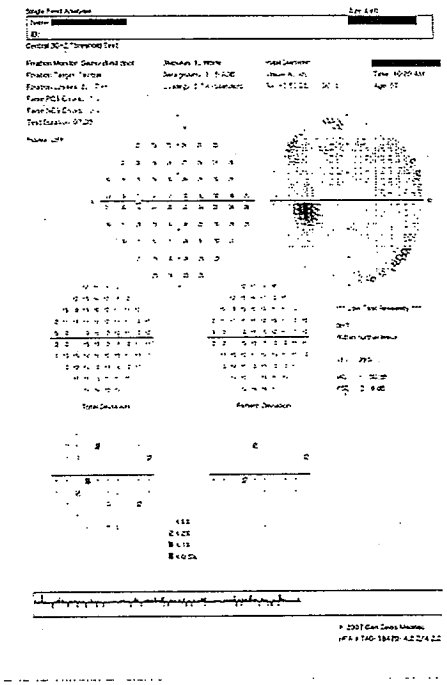
WHAT MORE BLOOD WORK SHOULD BE DONE ?

IS IT IMPORTANT TO SEE SCANS ??

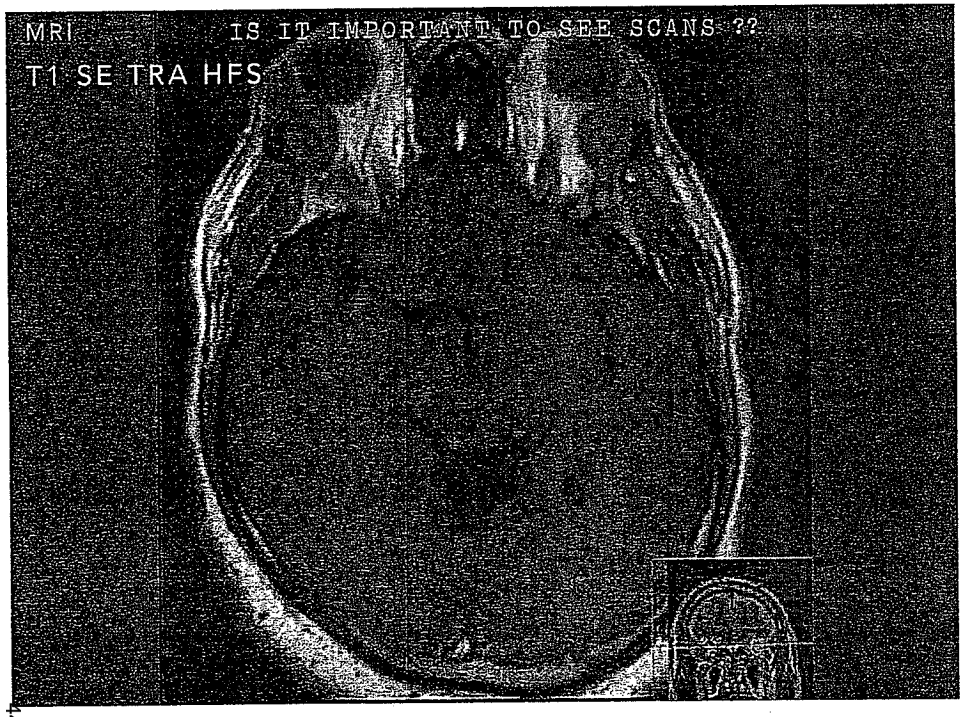
WHAT MORE TESTING SHOULD BE DONE IN CLINIC THAT DAY?
BESIDES HERTEL'S AND ISHIHARA ?

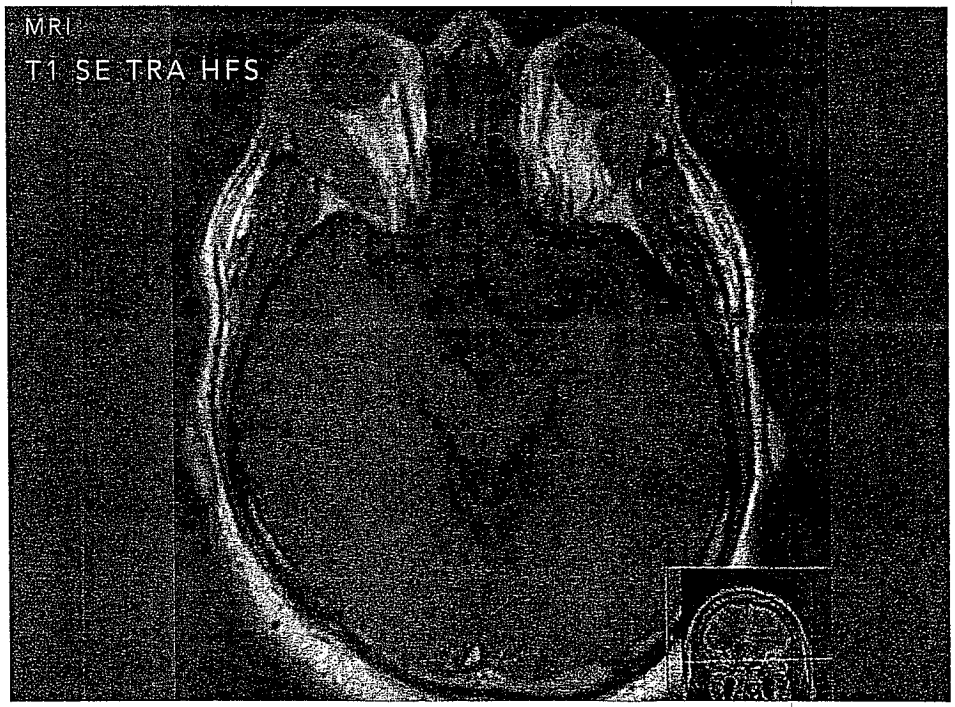
WHAT MORE [illegible] CLINIC THAT DAY?

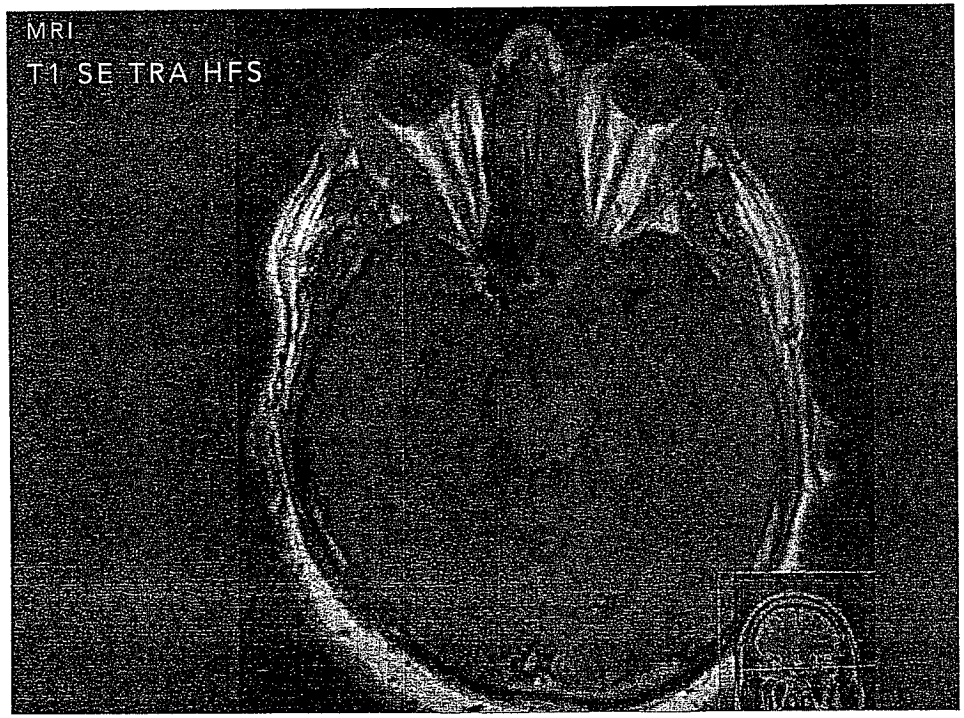


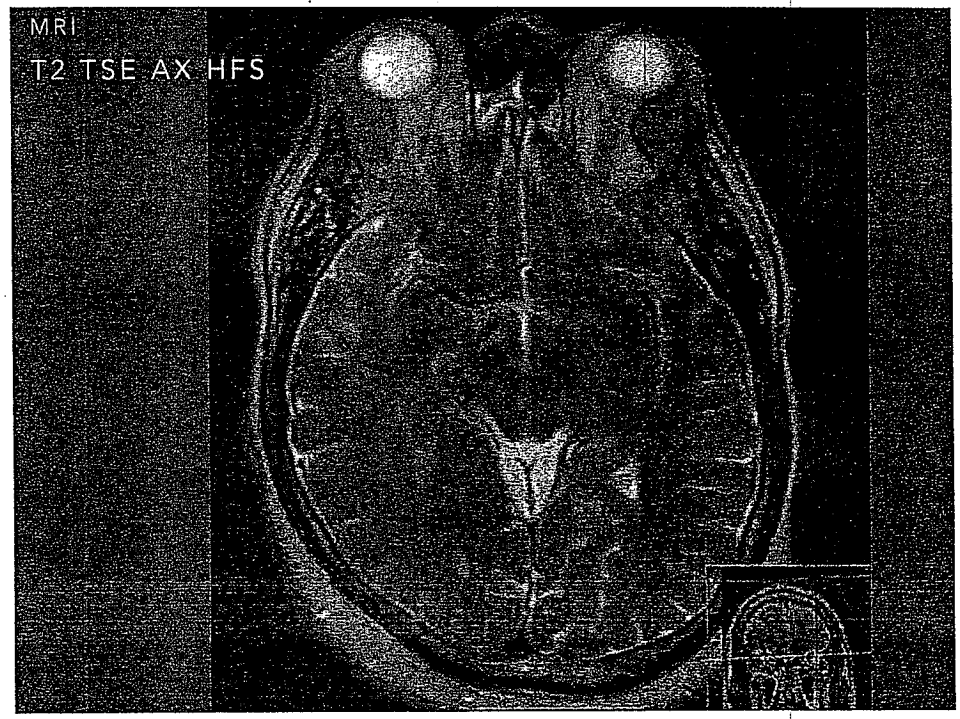


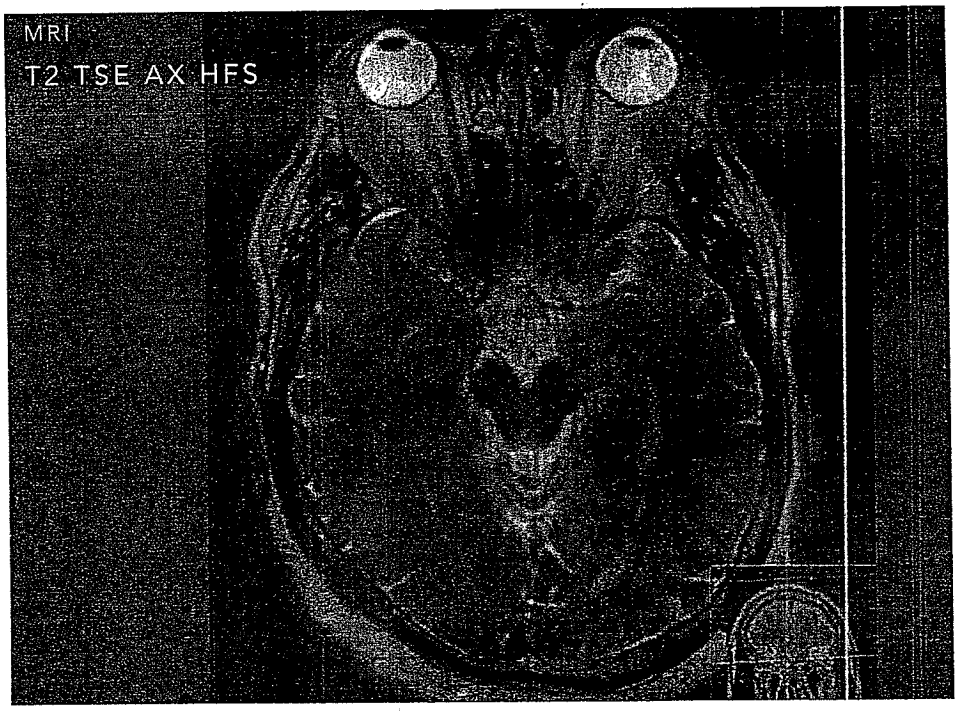
IS IT IMPORTANT TO SEE SCANS ??

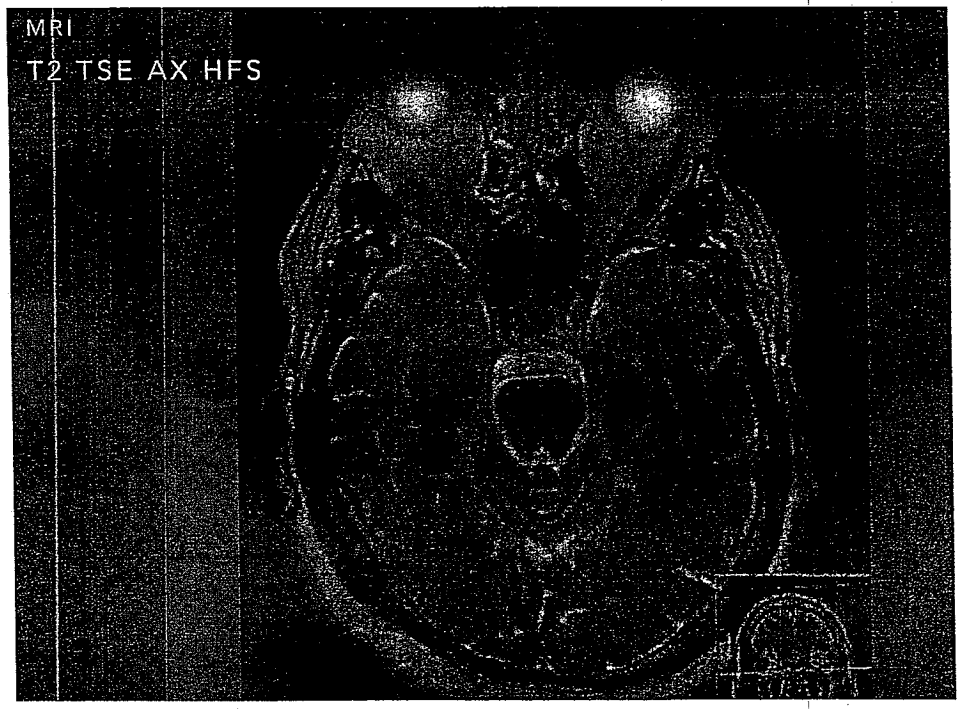


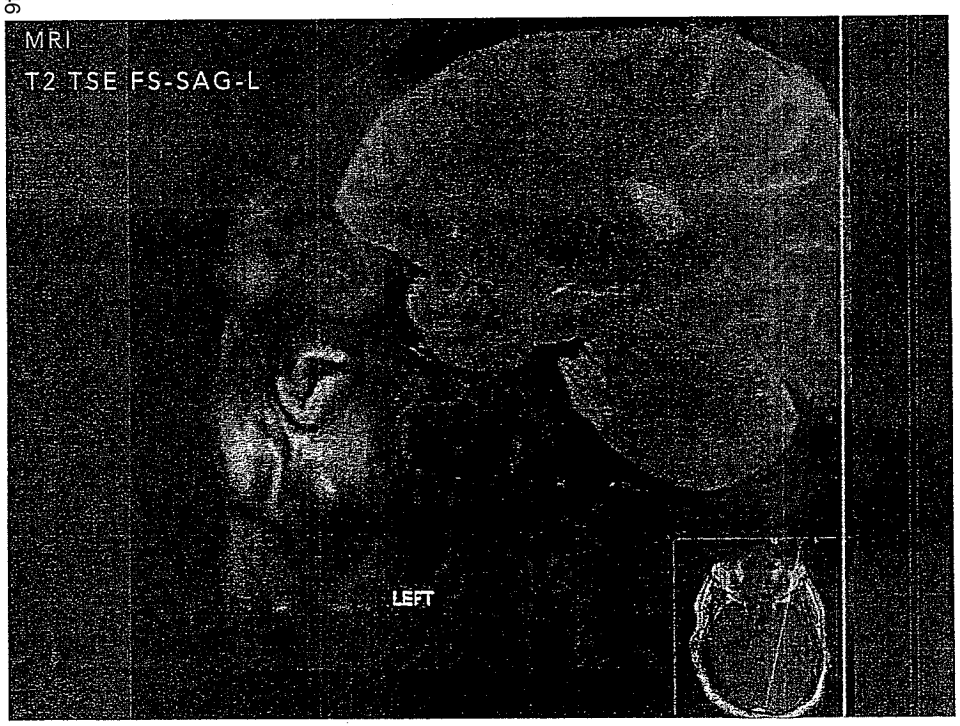


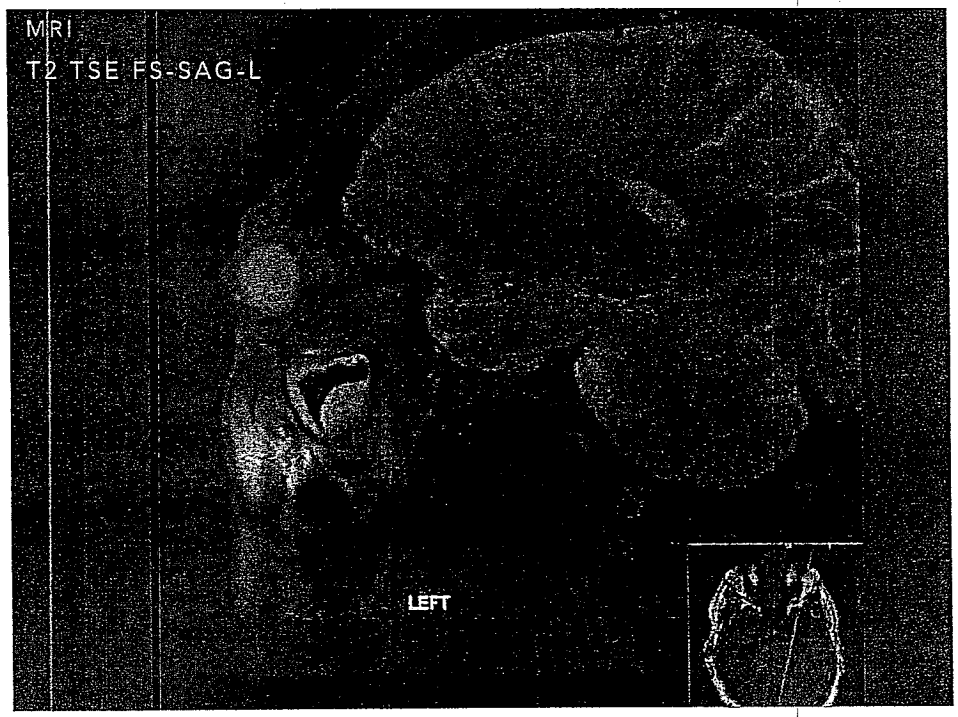


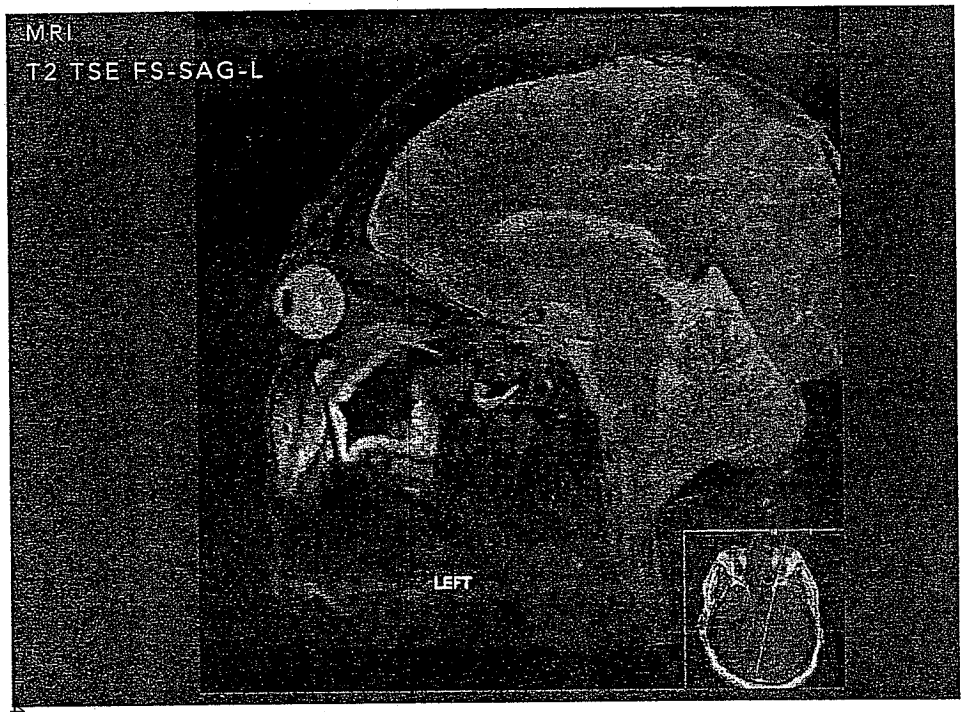


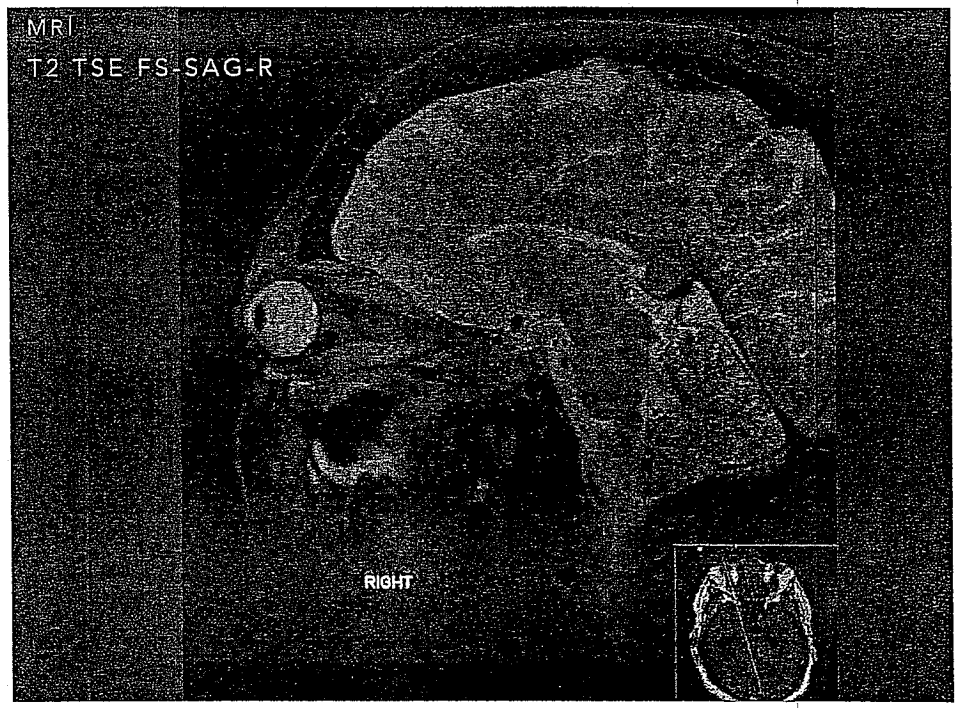

MRI
T2 TSE AX HFS

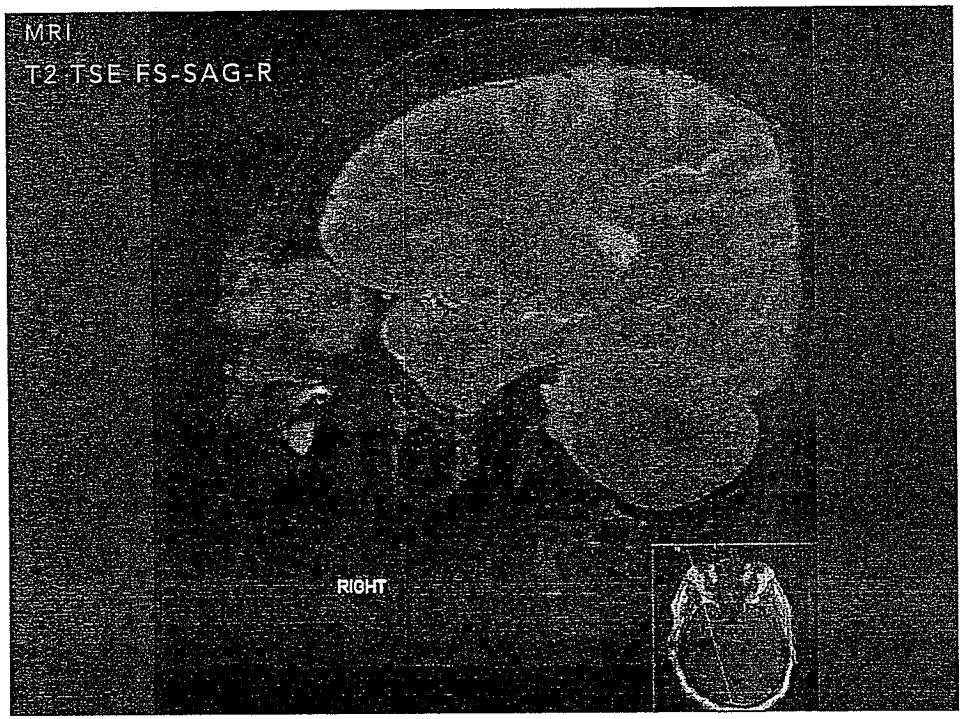

MRI
T2 TSE AX HFS

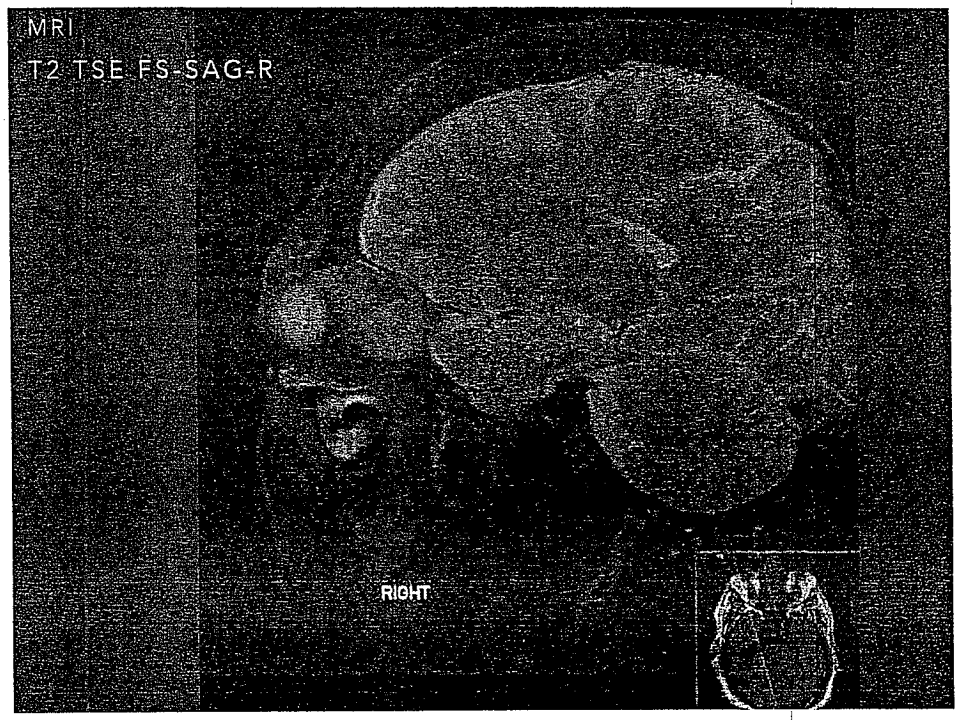

MRI
T2 TSE FS-SAG-L
LEFT

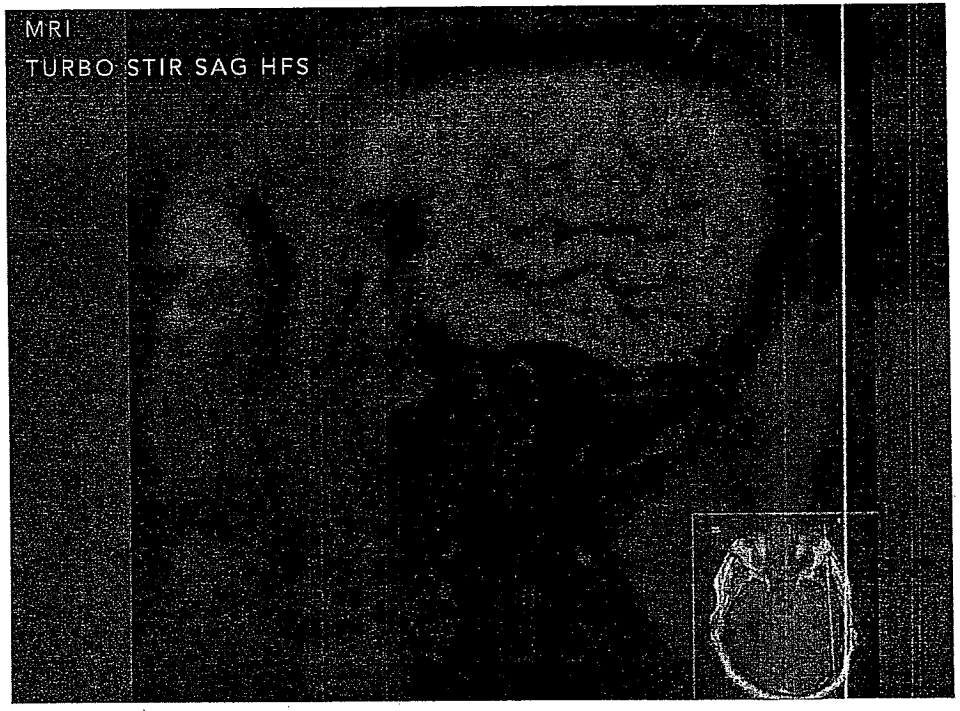

MRI
T2 TSE FS-SAG-L
LEFT

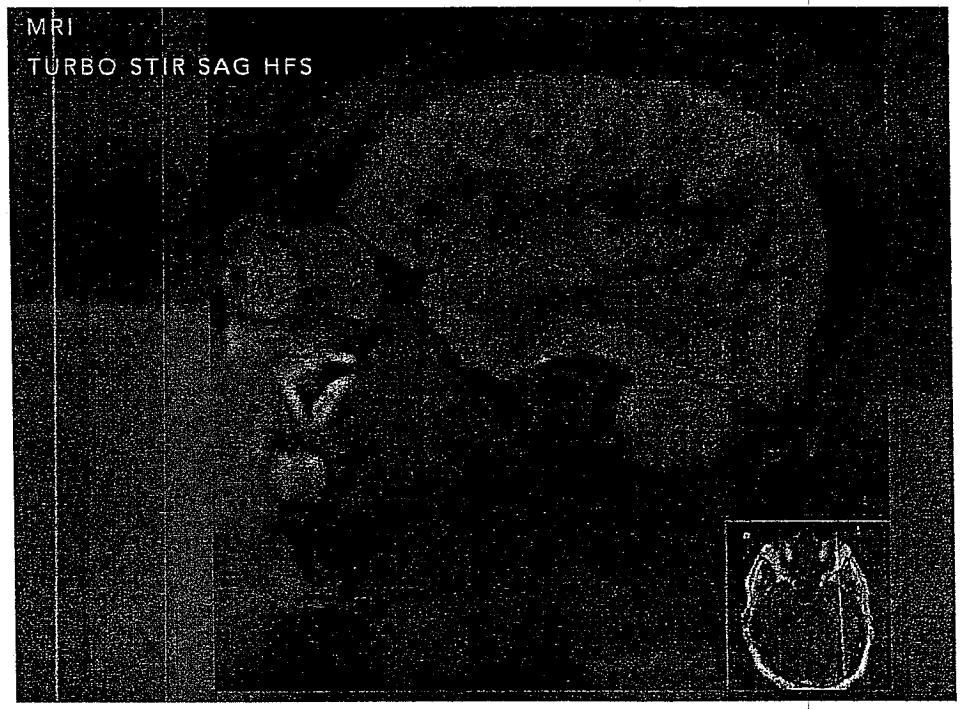

MRI
T2 TSE FS-SAG-L
LEFT

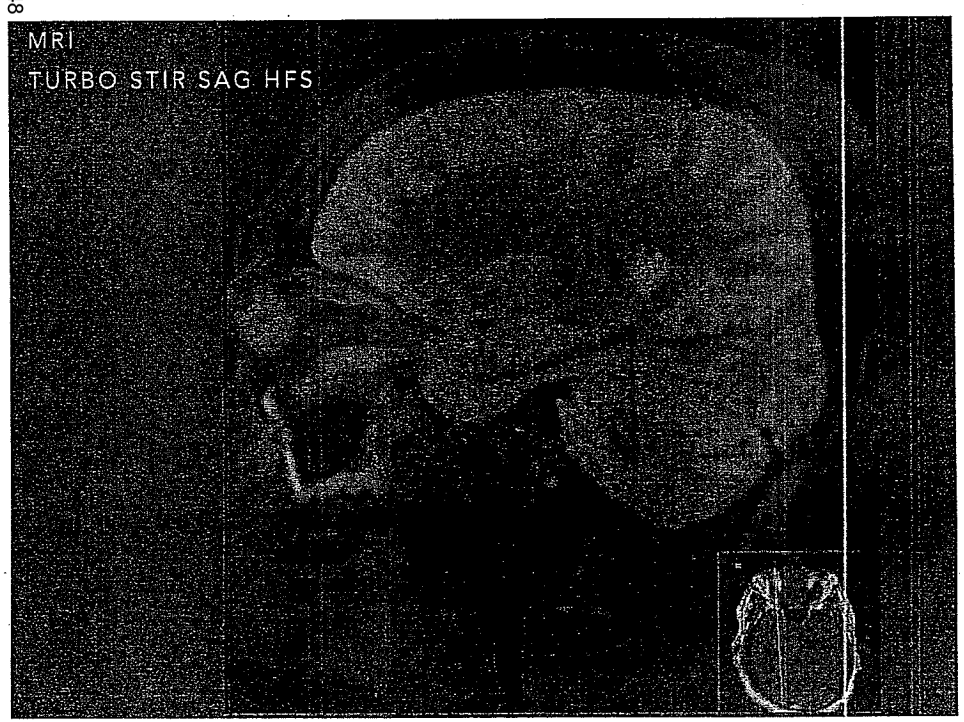

MRI
T2 TSE FS-SAG-R
RIGHT

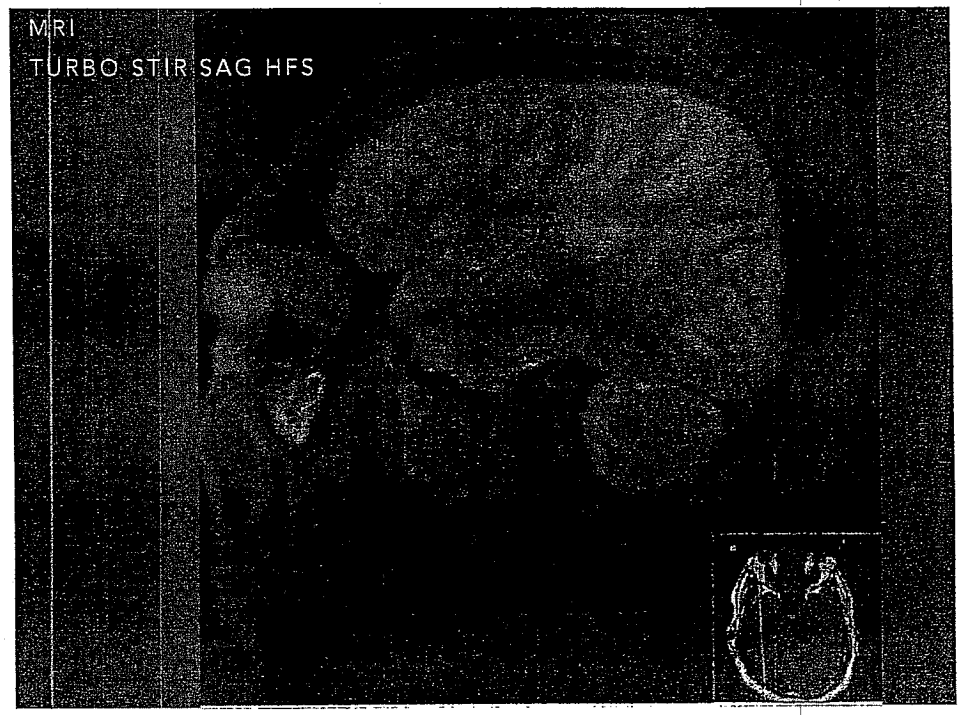

MRI
T2 TSE FS-SAG-R
RIGHT

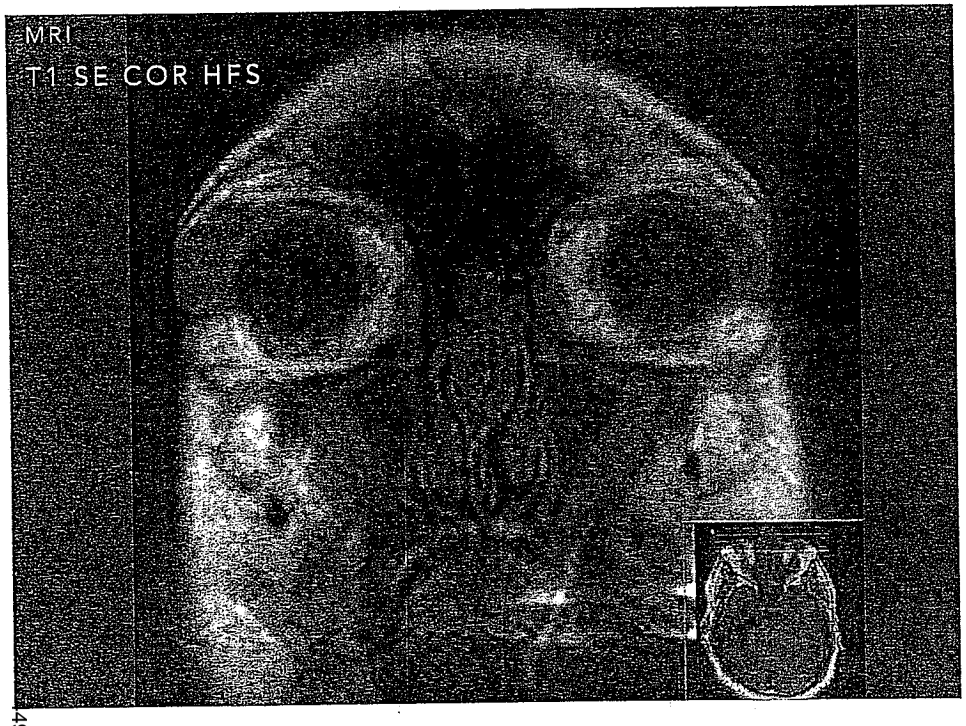

MRI
T2 TSE FS-SAG-R
RIGHT

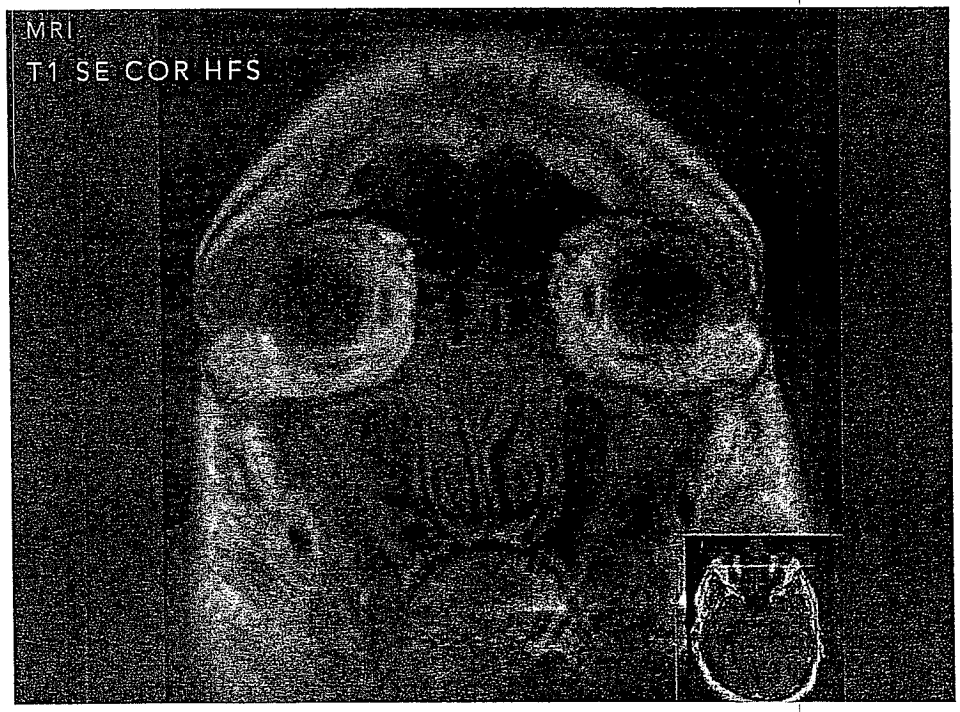

MRI
TURBO STIR SAG HFS

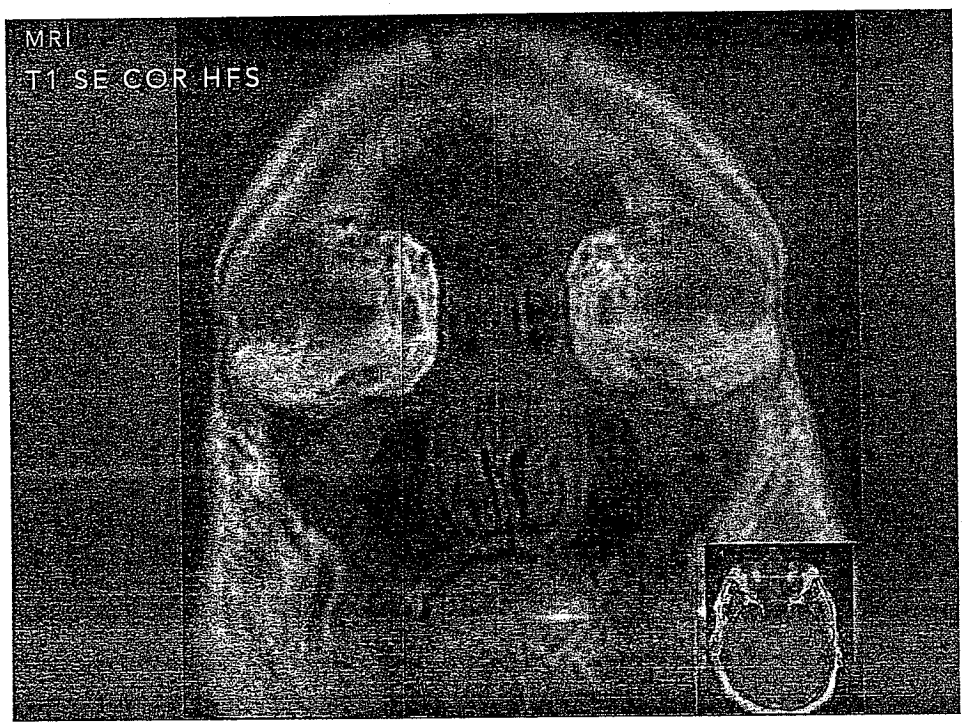

MRI
TURBO STIR SAG HFS

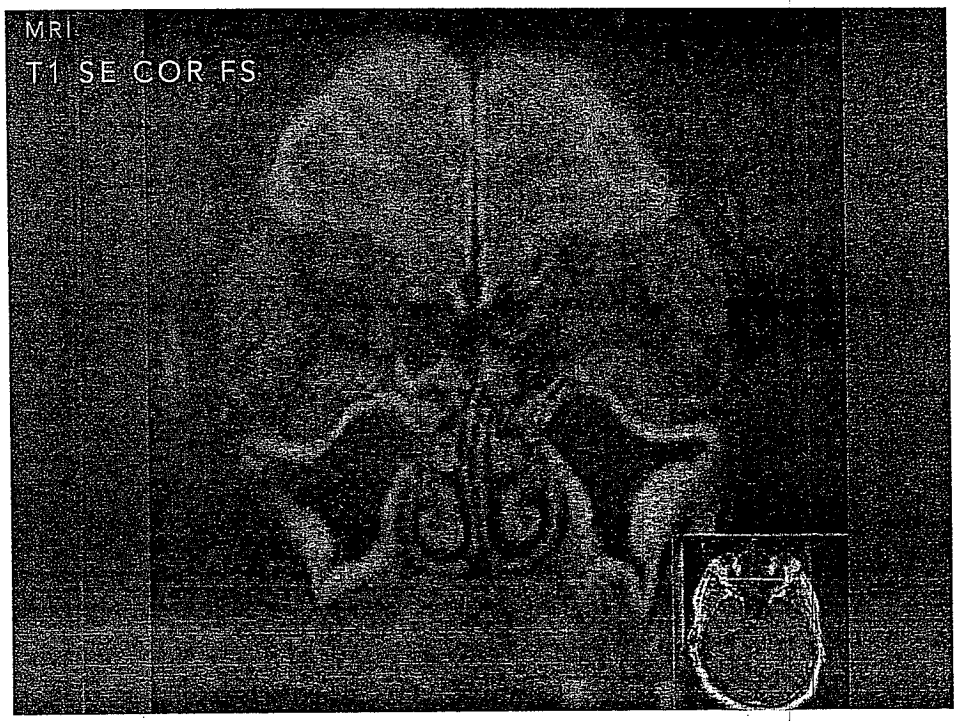

MRI
TURBO STIR SAG HFS


MRI
TURBO STIR SAG HFS


MRI
T1 SE COR HFS


MRI
T1 SE COR HFS


MRI
T1 SE COR HFS


MRI
T1 SE COR FS

MRI SUMMARY

- ABNORMAL ENLARGEMENT OF THE BILATERAL LACRIMAL GLANDS.
- ABNORMAL ENLARGEMENT OF THE BILATERAL LATERAL AND INFERIOR RECTUS AND TO LESSER EXTENT SUPERIOR RECTUS MUSCLES.
- MUCOSAL THICKENING IN THE BILATERAL ETHMOID, SPHENOID AND MAXILLARY SINUSES.
- LACK OF SOFT TISSUE FIBROUS HYPERPLASIA

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WHAT MORE BLOOD WORK SHOULD BE DONE ?

AACE Guidelines

AMERICAN ASSOCIATION OF CLINICAL ENDOCRINOLOGISTS
MEDICAL GUIDELINES FOR CLINICAL PRACTICE
FOR THE EVALUATION AND TREATMENT OF
HYPERTHYROIDISM AND HYPOTHYROIDISM

2005 AMENDED VERSION

ENDOCRINE PRACTICE Vol 8 No. 6 November/December 2002

Thyroid autoantibodies, including TSH receptor antibodies (TRAb) or thyroid-stimulating immunoglobulins (TSI)

These studies are not routinely necessary but may be helpful in selected cases, such as in patients with hyperthyroidism during pregnancy.

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WHAT MORE BLOOD WORK SHOULD BE DONE ?

Thyroid Function Tests

NIDDK

What is the thyroid gland?

Why are thyroid function tests performed?

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WHAT MORE BLOOD WORK SHOULD BE DONE ?

Thyroid-stimulating Immunoglobulin (TSI) Test

TSI is an autoantibody present in Graves' disease, the most common cause of hyperthyroidism. TSI mimics TSH by stimulating the thyroid cells, causing the thyroid gland to secrete excess hormone. The TSI test detects TSI circulating in the blood and is usually measured in specific instances in people with Graves' disease—when the diagnosis is obscure, during pregnancy, and to determine if remission has occurred.

Antithyroid Antibody Test

Antithyroid antibodies are present in Hashimoto's disease, the most common cause of hypothyroidism. Antithyroid antibodies are markers in the blood, and their presence is extremely helpful in diagnosing Hashimoto's disease. Two principal types of antithyroid antibodies are

- anti-TG antibodies, which attack a protein in the thyroid called thyroglobulin
- anti-thyroperoxidase, or anti-TPO, antibodies, which attack an enzyme in thyroid cells called thyroperoxidase

Blood Work

WHAT MORE BLOOD WORK SHOULD BE DONE ?

TESTS	RESULT	FLAG	UNITS	REFERENCE INTERVAL	LAB
Antithyroglobulin Ab					
Thyroglobulin, Antibody	<1.0		IU/mL	0.0 - 0.9	01
					01
Please Note: Low positive Thyroglobulin antibodies are seen in a portion of the asymptomatic populations. Antithyroglobulin antibodies measured by Beckman Coulter Methodology					
Angiotensin-Converting Enzyme					
ACE	82	High	U/L	12 - 68	01
Effective December 16, 2013 the reference interval for Angiotensin Converting Enzyme will be changing to:				0 - 2 years: 18 - 95; 3 - 14 years: 22 - 108; 15 years or older: 14 - 82	
Thyrotropin Receptor Ab, Serum	<0.51		IU/L	0.00 - 1.75	02
Thyroid Stim Immunoglobulin	38		%	0 - 139	02
Thyroid Peroxidase (TPO) Ab	7		IU/mL	0 - 34	01
Lysozyme, Serum	5.1		ug/mL	3.0 - 12.8	02

ELEVATED ACE

01 RN LabCorp Raritan, 69 First Avenue, Raritan, NJ 08869-1800 — Dir: Araceli B Reyes, MD

02 BN LabCorp Burlington, 1447 York Court, Burlington, NC 27215-3361 — Dir: William F Hancock, MD

For inquiries, the physician may contact Branch: 800-631-5250 Lab: 800-631-5250

#1 DIFFERENTIAL NOW & NEXT TEST ?

Seven intraocular clinical signs that are suggestive of ocular sarcoidosis are:

1. Mutton-fat KPs (large or small) and/or iris nodules at the pupillary margin (Koeppe) or in the stroma (Bussacca)
2. TM nodules and/or tent-shaped PAS
3. Snowballs/string of pearls vitreous opacities
4. Multiple chorioretinal peripheral lesions (active and atrophic)
5. Nodular and/or segmental periphlebitis (± candel wax drippings) and/or macroaneurism in an inflamed eye
6. Optic disc nodule(s)/granuloma(s) and/or solitary choroidal nodule
7. Bilaterality (assessed by clinical examination or laboratory tests showing subclinical inflammation)

(Abbreviations: KP: Keratic precipitate; TM: Trabecular meshwork; PAS: Peripheral anterior synechiae). (*Source*: Herbort CP, Rao NA, Mochizuki M. International criteria for the diagnosis of ocular sarcoidosis: results of the first International Workshop on Ocular Sarcoidosis (IWOS). Ocul Immunol Inflamm. 2009;17:160-9.)

Five laboratory tests that are carried out on suspected ocular sarcoidosis patients are:

1. Negative tuberculin test in a BCG-vaccinated patient or having had a positive PPD (or Mantoux) skin test previously
2. Elevated serum ACE and/or elevated serum lysozyme*
3. Chest X-ray: look for BHL
4. Abnormal liver enzyme tests*
5. Chest CT scan in patients with negative chest X-ray

*Test required in patients treated with ACE inhibitors

*Positive when serum levels of alkaline phosphatase are more than three times the upper limit of normal; or when two of the following liver enzymes, alkaline phosphatase, ASAT, ALAT, or γGTP, are more than twice the upper limit of normal

(Abbreviations: BCG: Bacillus Calmette-Guérin; PPD: Purified protein derivative; ACE: Angiotensin-converting enzyme; BHL: Bilateral hilar lymphadenopathy; CT: Computed tomography; ASAT: Aspartate aminotransferase; ALAT: Alanine aminotransferase; γGTP: γ-glutamyl transpeptidase) (*Source*: Herbort CP, Rao NA, Mochizuki M. International criteria for the diagnosis of ocular sarcoidosis: results of the first International Workshop on Ocular Sarcoidosis (IWOS). Ocul Immunol Inflamm. 2009;17:160-9.)

IWOS 2009

#1 DIFFERENTIAL NOW & NEXT TEST ?

First of all other possible causes of uveitis, in particular tuberculosis uveitis, must be ruled out

Biopsy supported diagnosis with a compatible uveitis	Definite ocular* sarcoidosis
Biopsy not done; presence of BHL with a compatible uveitis	Presumed ocular sarcoidosis
Biopsy not done and BHL negative; presence of three of the suggestive intraocular signs and two positive laboratory tests	Probable ocular sarcoidosis
Biopsy negative, presence of four of the suggestive intraocular signs and two positive laboratory tests	Possible ocular sarcoidosis

*Used in the sense of intraocular inflammatory lesions both in patients with systemic disease and in patients with disease seemingly limited to the eye without any clinically detectable involvement of another organ

(Abbreviation: BHL: Bilateral hilar lymphadenopathy). (*Source*: Herbort CP, Rao NA, Mochizuki M. International criteria for the diagnosis of ocular sarcoidosis: results of the first International Workshop on Ocular Sarcoidosis (IWOS). Ocul Immunol Inflamm. 2009;17:160-9.)

IWOS 2009

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BIOPSY

*RIGHT ANTERIOR ORBITOTOMY AND LACRIMAL GLAND BIOPSY

*FIRST POST-OP VISIT STARTED ON 20MG PREDNISONE PENDING PATHOLOGY REPORT

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PATH REPORT

DX: ATYPICAL LYMPHOID HYPERPLASIA

- H&E: Fibrosis around lacrimal duct and Lymphoplasmocytic infiltrates around germinal centers with rare Eosinophils No Lymphoepithelial lesion NO GRANULOMA
- Trichome: Mild Fibrosis
- IgG or IgG4 staining: NO Ig4 RELATED SCLEROSING disease

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PATH REPORT

DX: ATYPICAL LYMPHOID HYPERPLASIA

- IMMUNOHISTOCHEMISTRY
  - B-Cells: CD20 & Pax-5 secondary follicles with Ki-67 suggest Germinal center proliferation as expected
  - T-Cells: CD3,CD43 staining
  - CD-21: Follicular Dendritic cell meshwork
  - AE1/AE3: Ductal Epithelium staining
  - CD68: Scattered Histiocytes

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PATH REPORT

DX: ATYPICAL LYMPHOID HYPERPLASIA

- B CELL PCR
  - NO GENE REARRANGEMENTS FOR
    - Immunoglobulin Heavy chain genes (IGH) for FR1, FR2, FR3
    - Immunoglobulin Kappa Light Chain (IGK)

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FOLLOW-UP

- SENT FOR HEM-ONCOLOGY CONSULT
- PREDNISONE DECREASED TO 10MG AND TAPER STARTED

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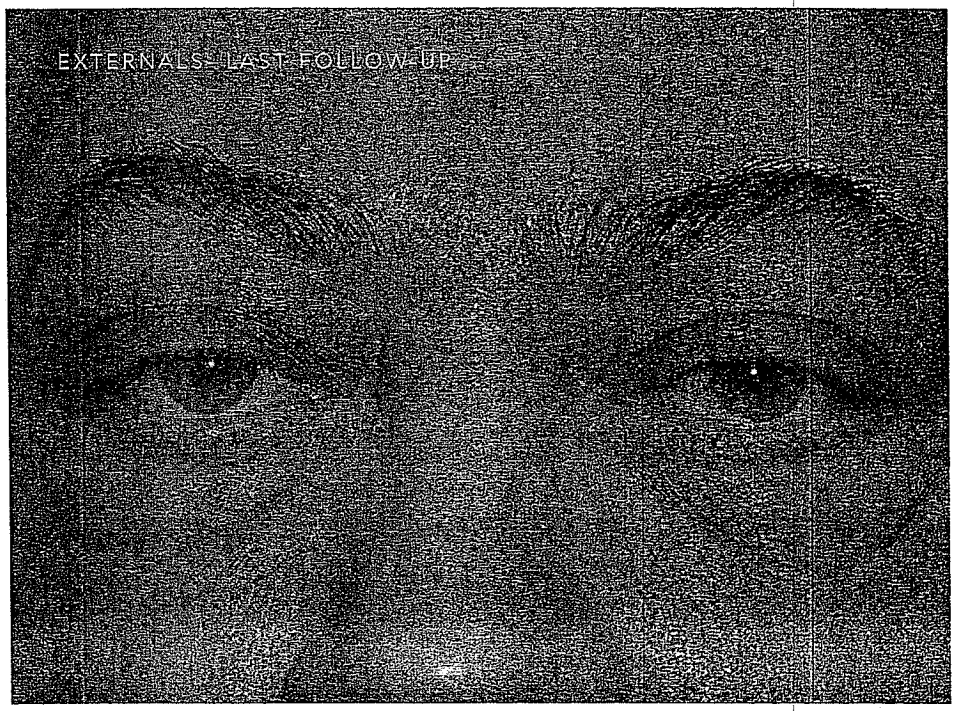
LAST FOLLOW-UP

- HEM-ONCOLOGY CONSULT NEGATIVE FOR LYMPHOMA
- PATIENT REPORTS SIGNIFICANT DECREASED PROPTOSIS

EXTERNALS - LAST FOLLOW-UP



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ORBITAL INFLAMMATORY DISEASE

REVIEW

1. DIAGNOSIS
2. MANAGEMENT

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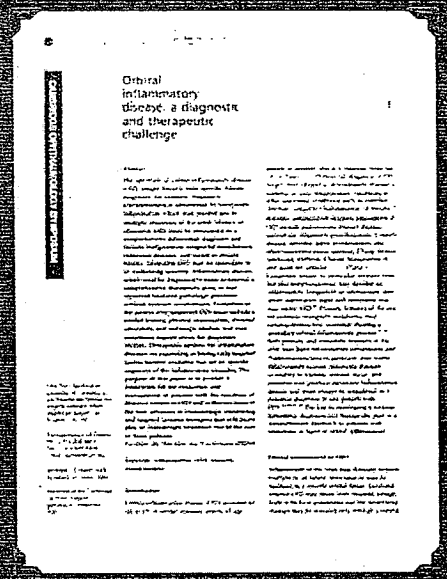
REVIEW



Orbital inflammatory disease: a diagnostic and therapeutic challenge

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REVIEW

* FORMERLY TERMED PSEUDOTUMOR: 6% OF ORBITAL DISEASE
* CAN BE UNILATERAL OR BILATERAL
* CAN BE DIFFUSE INVOLVING LACRIMAL, MUSCLE, ORBITAL SOFT TISSUE OR LOCALIZED TO ONE.
* CAN BE ACUTE OR SUBACUTE OR CHRONIC
* SCLEROSING VARIANT: TYPE OF CHRONIC PROGRESSIVE PROPTOSIS, RESTRICTED MOTILITY, DULL, CHRONIC PAIN
* DIAGNOSIS OF EXCLUSION

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ANATOMIC SUBTYPES

* DIFFUSE – ANTERIOR OR POSTERIOR
* MYOSITIS
* DACRYOADENITIS
* TENONITIS OR POSTERIOR SCLERITIS – ASSOCIATED WITH INTRAOCULAR FINDINGS
* OPTIC PERINEURITIS – ACCOMPANIED BY PAPILLITIS

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EXACT SYMPTOMS DEPENDING ON PRIMARY TISSUE AFFECTED

ACUTE [0] DACRYOADENITIS

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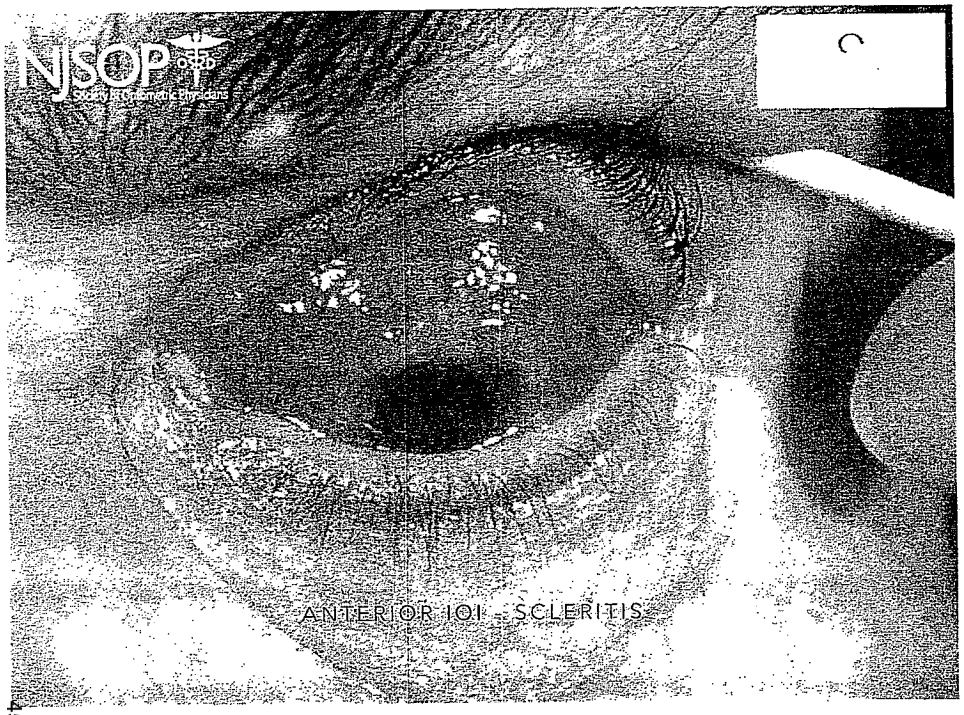
UNILATERAL [0] WITH SWELLING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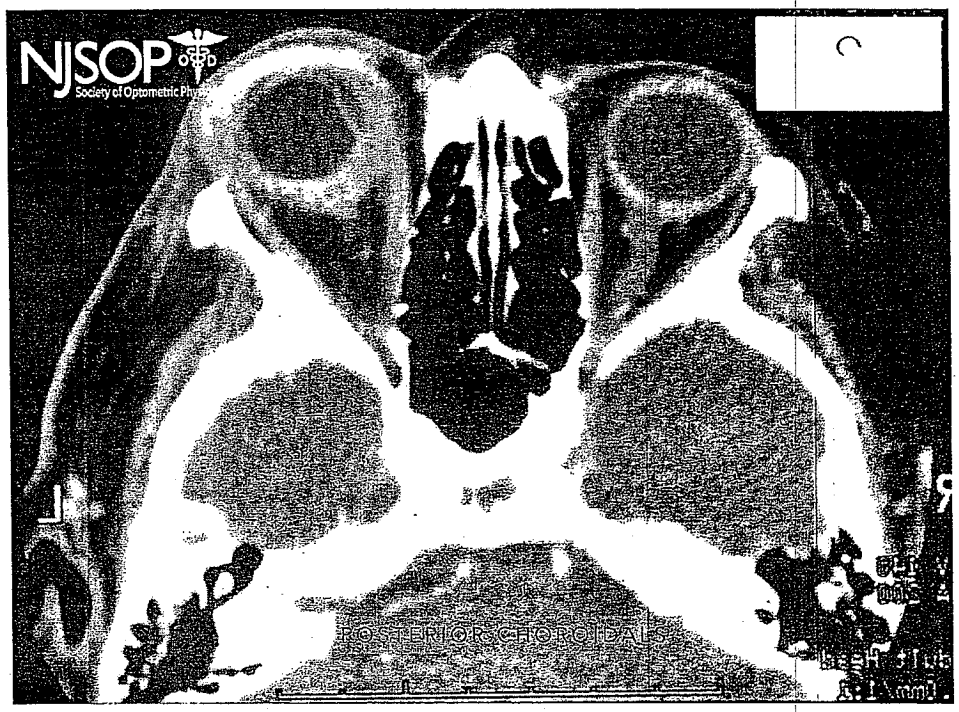
C
ANTERIOR IOI - SCLERITIS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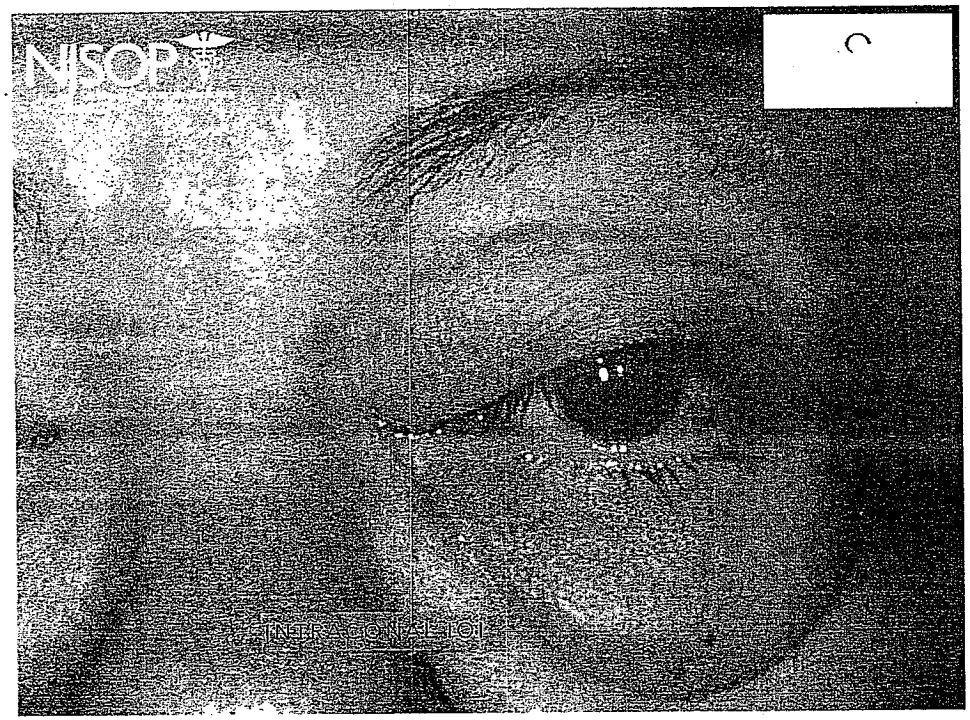
C
POSTERIOR CHOROIDAL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W/U

- HISTORY
  - ONSET AND DURATION
    - ACUTE, EXPLOSIVE DISEASE INFECTIOUS, IDIOPATHIC INFLAMMATORY DISEASE, OR SUDDEN CHANGE IN A PRE-EXISTING LESION
    - INSIDIOUS CHRONIC PROGRESSIVE DISEASE IDIOPATHIC SCLEROSING ORBITAL INFLAMMATION.PATIENTS NOT ALWAYS COGNIZANT FAMILY ALBUM SCAN
    - ASKED ABOUT ALTERATIONS WITH VALSALVA OR POSITIONAL
  - CHARACTERIZATION ERYTHEMA, PAIN, EXOPHTHALMOS, DIPLOPIA, BLURRED VISION, ACQUIRED COLOR VISION ABNORMALITIES, OR PERCEIVED CHANGES IN THE VISUAL FIELD
  - PAST MEDICAL HISTORY, INCLUDING SINUS DISEASE, DIABETES, THYROID DISEASE, COLLAGEN-VASCULAR DISEASE, AND CANCER
  - FAMILY HISTORY OF IMMUNE, MEDIATED DISEASES MAY ALSO BE RELEVANT TO THE DIFFERENTIAL DIAGNOSIS OF OID.

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W/U

- OPHTHALMOLOGIC EVALUATION
  - REFRACTION INDUCED ASTIGMATISM FROM ORBITAL MASS OR SECONDARY AMBLYOPIA ESP. PEDIATRIC.
  - OPTIC NERVE FUNCTION INCLUDES COLOR TESTING, PUPIL FOR APD, SYMPATHETIC AND OCULOMOTOR INNERVATION.
  - CORNEAL SENSATION TRIGEMINAL NERVE.
  - SLIT LAMP OCULAR SURFACE AND ANTERIOR SEGMENT AND USE OF TOPICAL NEOSYNEPHRINE TO IDENTIFY INFLAMED VASCULATURE.
  - INTRAOCULAR PRESSURE MEASUREMENTS IN PRIMARY & VERTICAL GAZE DIRECTIONS.
  - DEE RETINA AND OPTIC NERVE AND SPECIFICALLY CHOROIDAL FOLDS OR ABNORMAL RETINAL VASCULATURE.
  - FORMAL VISUAL FIELD TESTING IS REQUIRED IF PATIENT SYMPTOMATIC OR CONCERN ABOUT A POTENTIAL COMPRESSION.

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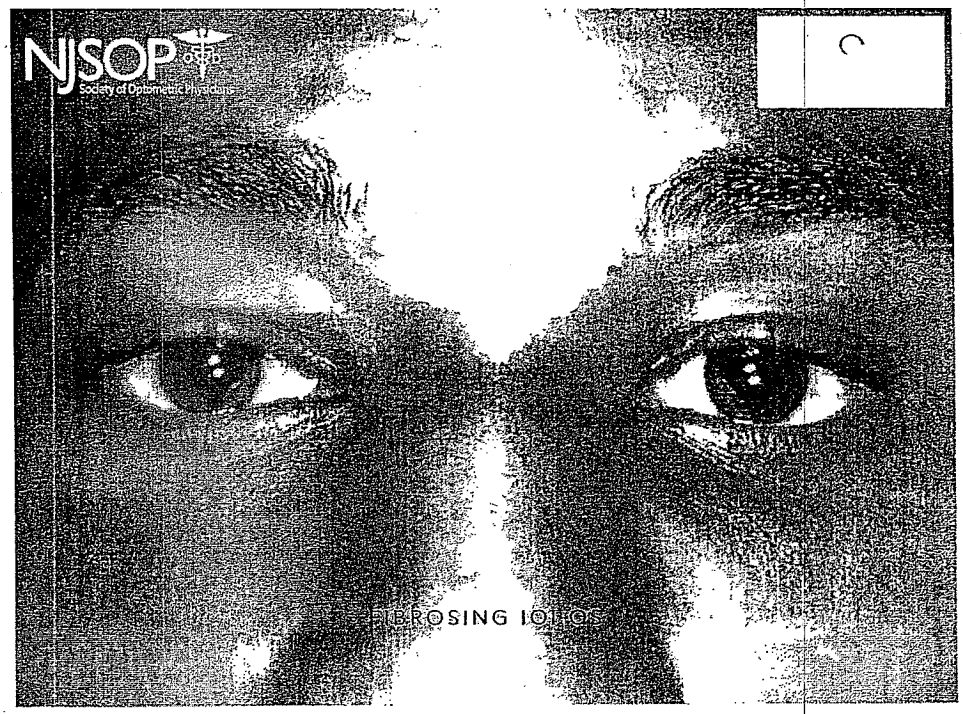
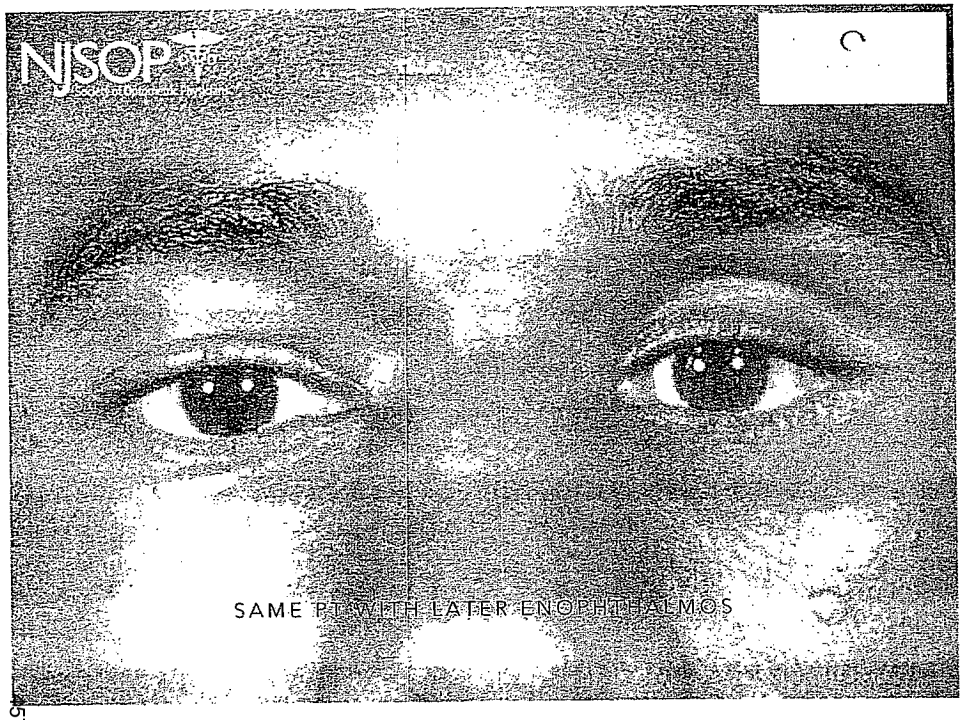
W/U

- ORBIT EVALUATION
  - EXOPHTHALMOMETRY STANDARD WAY AND DIRECTION OF GLOBE DISPLACEMENT QUANTIFIED USING FACIAL LANDMARKS OR THE FELLOW EYE.
  - AUSCULTATION FOR BRUIT DIAGNOSIS OF SPECIFIC VASCULAR LESIONS.
  - ORBITAL PALPATION MAY REVEAL ORBITAL MASS LESIONS OR DEFINE AREAS OF POINT TENDERNESS.
  - DYNAMIC OBSERVATION DURING VOLUNTARY VALSALVA VASCULAR OR BONE MALFORMATIONS.
  - GLOBE POSITION MEASUREMENT AS CICATRIZING ENOPHTHALMIC SIDE ABNORMAL.
  - OCULAR MOTILITY: PARALYTIC OR RESTRICTIVE STRABISMUS.
  - ORBITAL PALPATION MAY REVEAL ORBITAL MASS LESIONS OR DEFINE AREAS OF POINT TENDERNESS.





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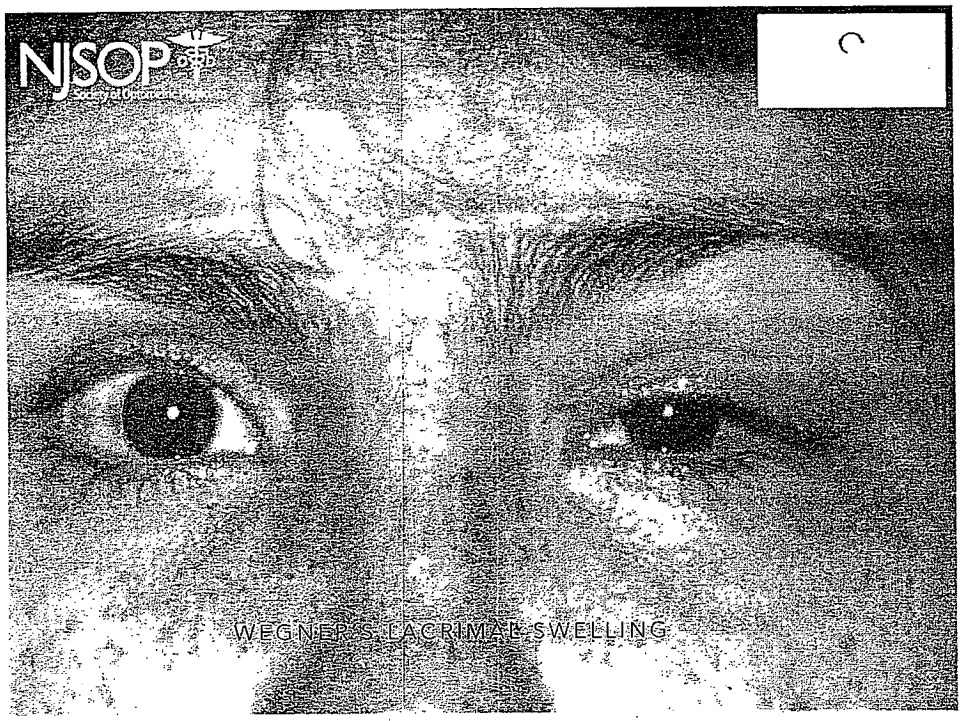
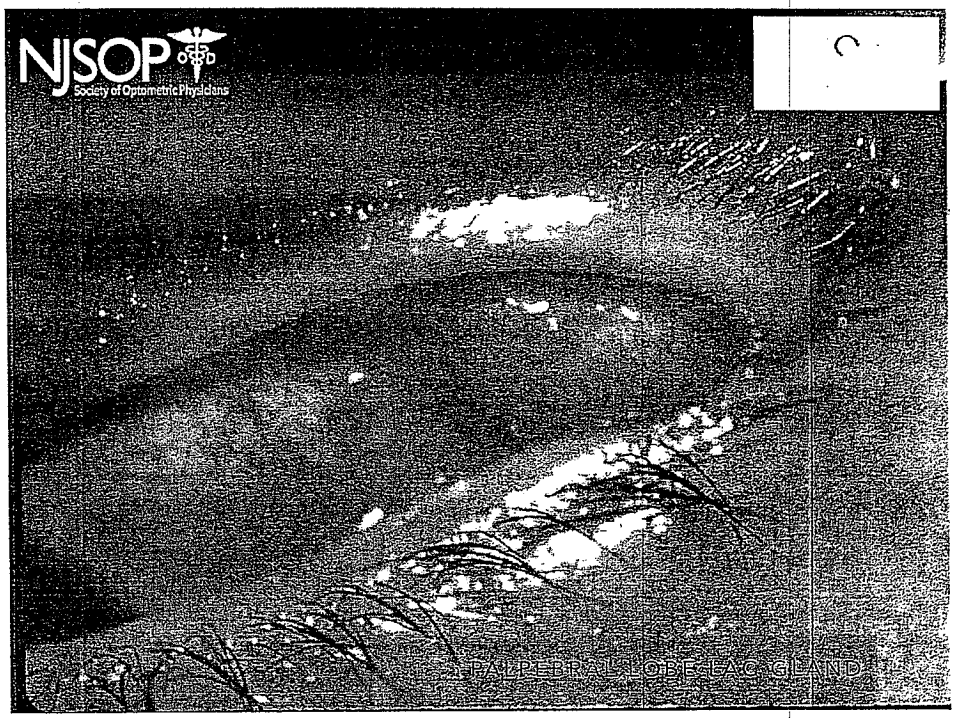
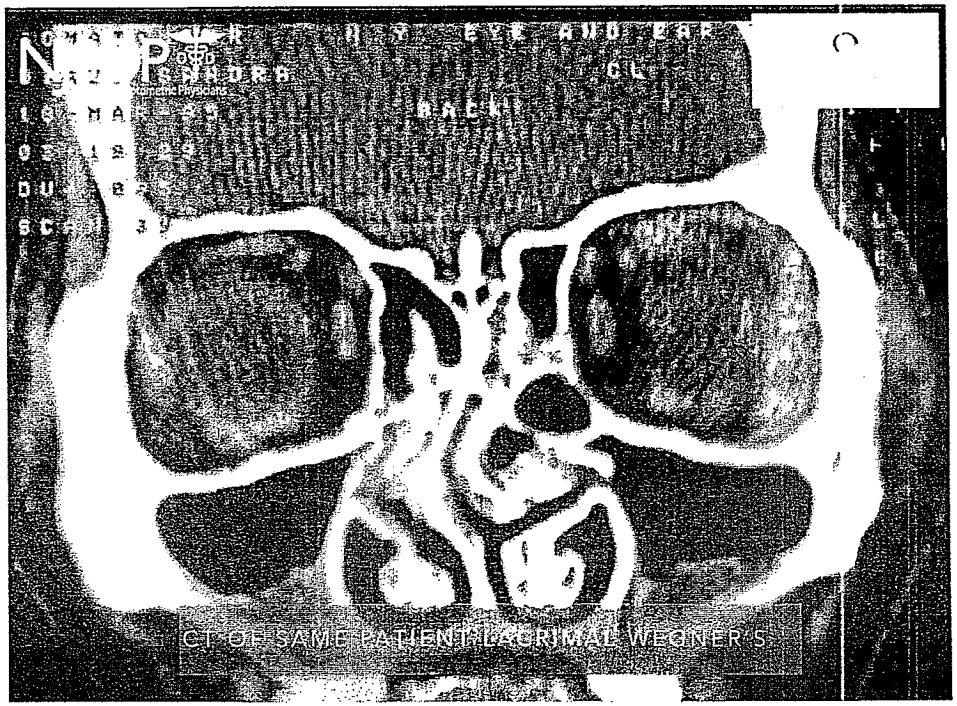
D/D

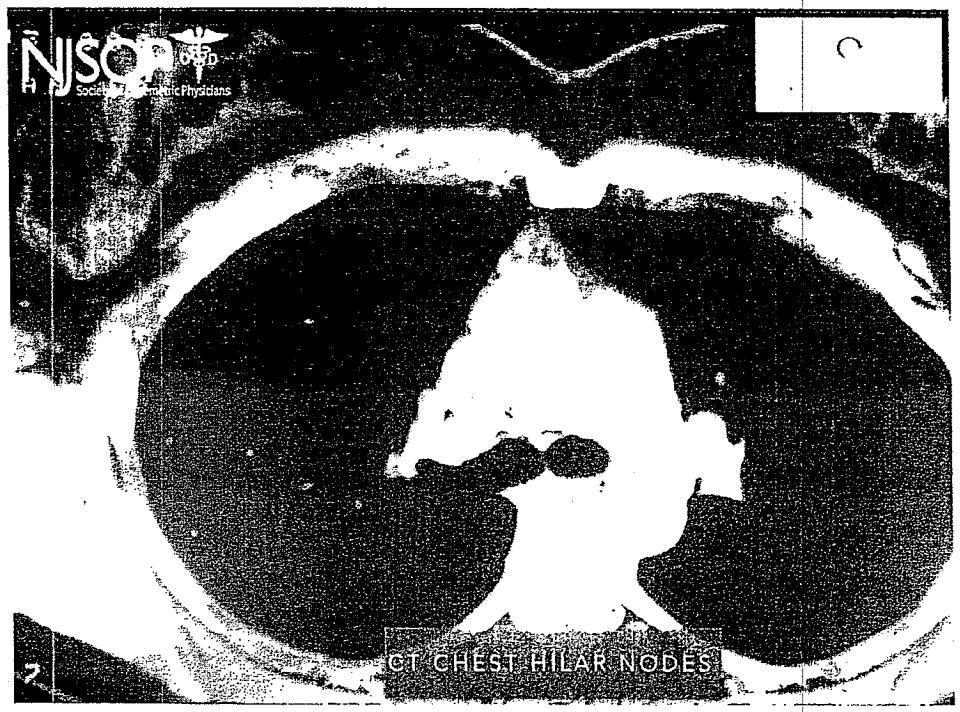
- ENDOCRINE EXOPHTHALMOS: THYROID
- SYSTEMIC GRANULOMATOUS DISEASES
  - SARCOIDOSIS (DISCUSSED ABOVE)
  - WEGNER'S SYSTEMIC VASCULITIS RENAL, RESPIRATORY, SINUS, ORBIT (50%)
  - ERDHEIM-CHESTER IS A SYSTEMIC NON-LANGERHANS HISTOLYTIC XANTHOGRANULOMATOUS INFLAMMATORY DISEASE ORBITAL: BRAIN, HEART, LUNG, LIVER, KIDNEY, RETROPERITONEAL SPACE, AND MUSCULOSKELETAL SYSTEM
  - CHURG-STRAUSS SYNDROME NECROTIZING EOSINOPHILIC VASCULITIS: EOSINOPHILIA AND ASTHMA
  - TOLOSA-HUNT SYNDROME: PAINFUL OPHTHALMOPLEGIA



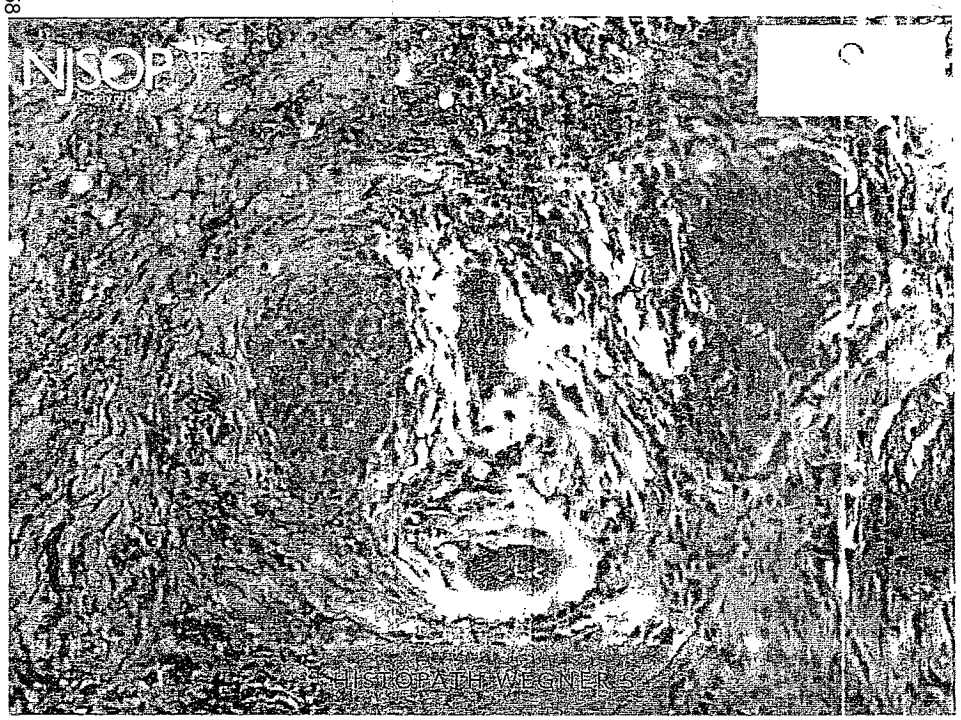




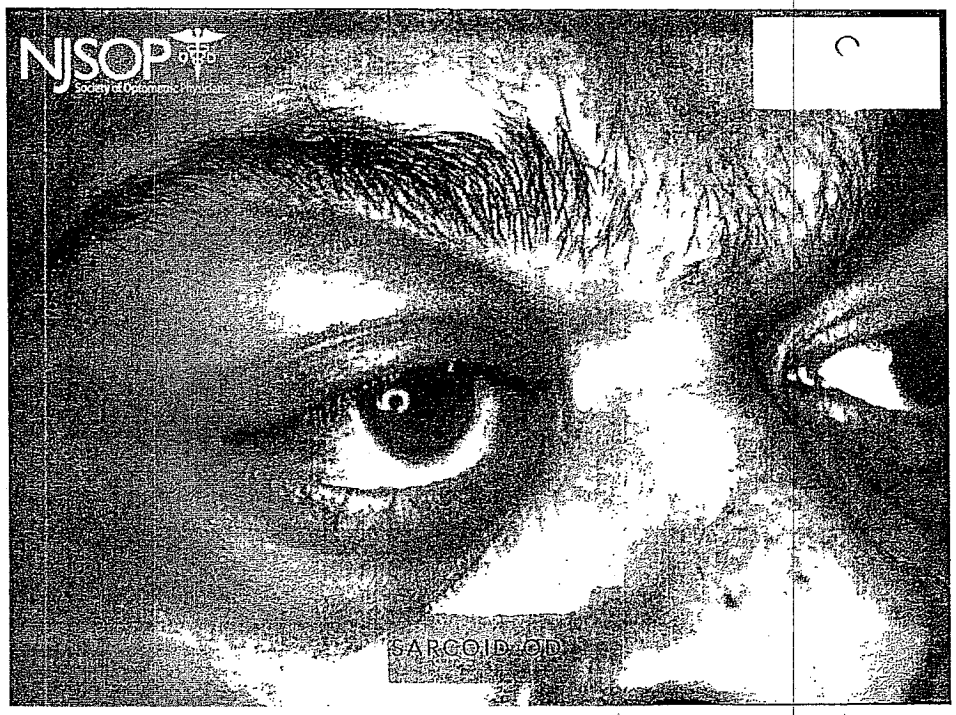
CT OF SAME PATIENT LACRIMAL WEGNER'S



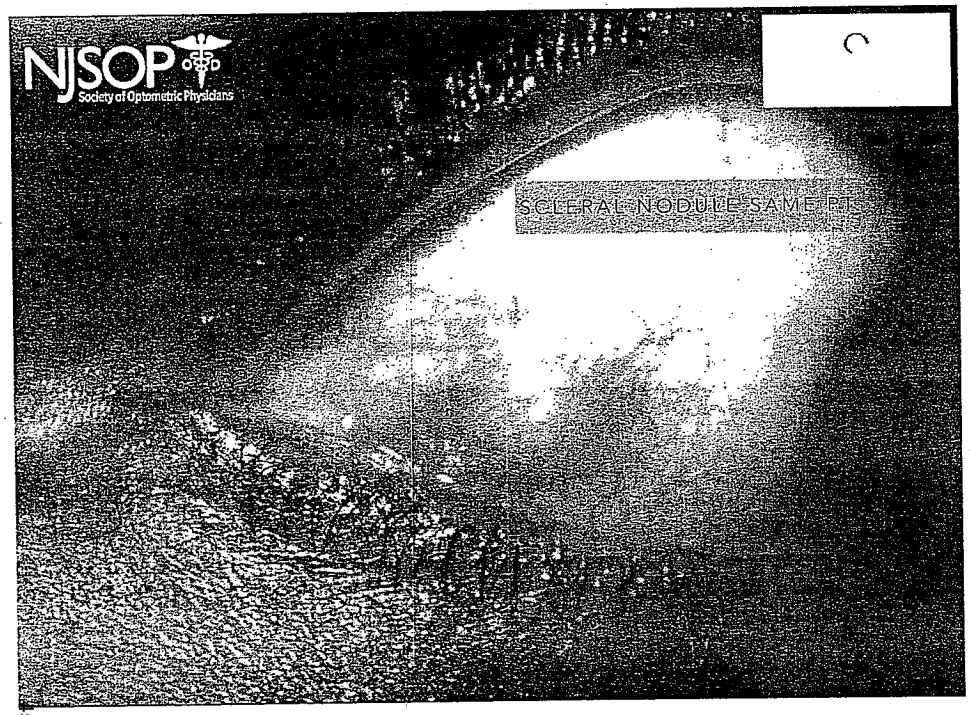
CT CHEST HILAR NODES



HISTOPATH WEGNER'S



SARCOID OD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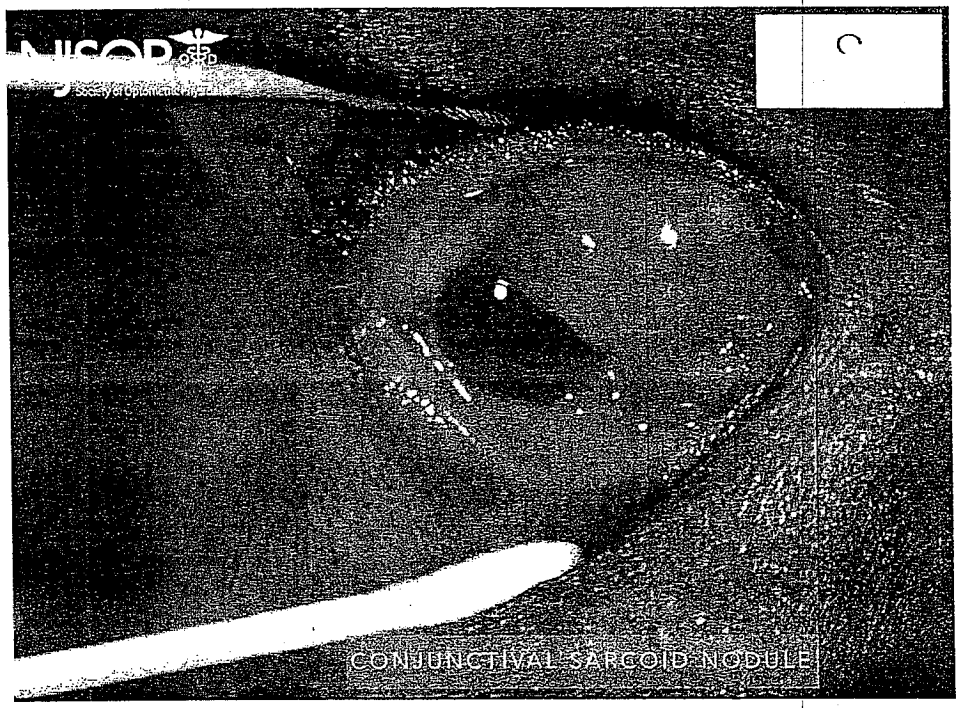
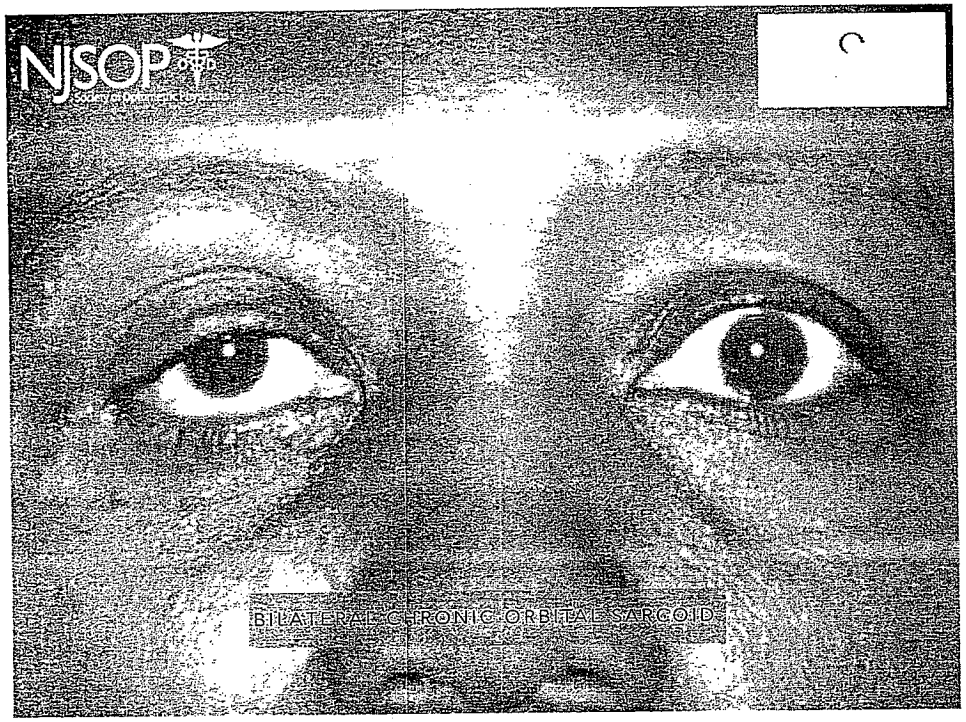
SCLERAL NODULE SAME PT.


CONJUNCTIVAL SARCOID NODULE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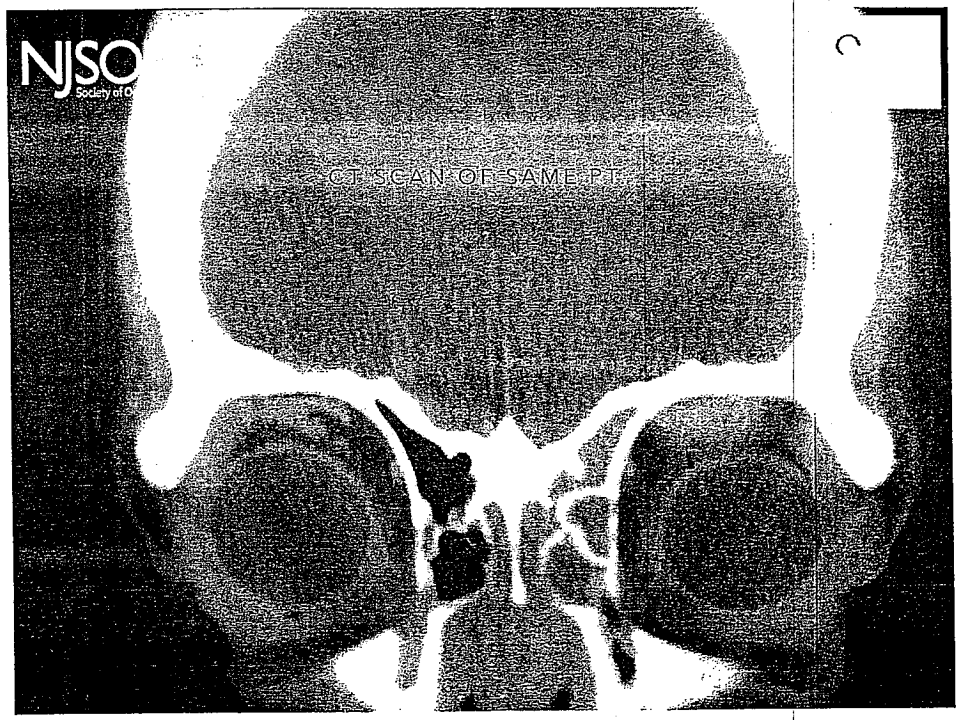
BILATERAL CHRONIC ORBITAL SARCOID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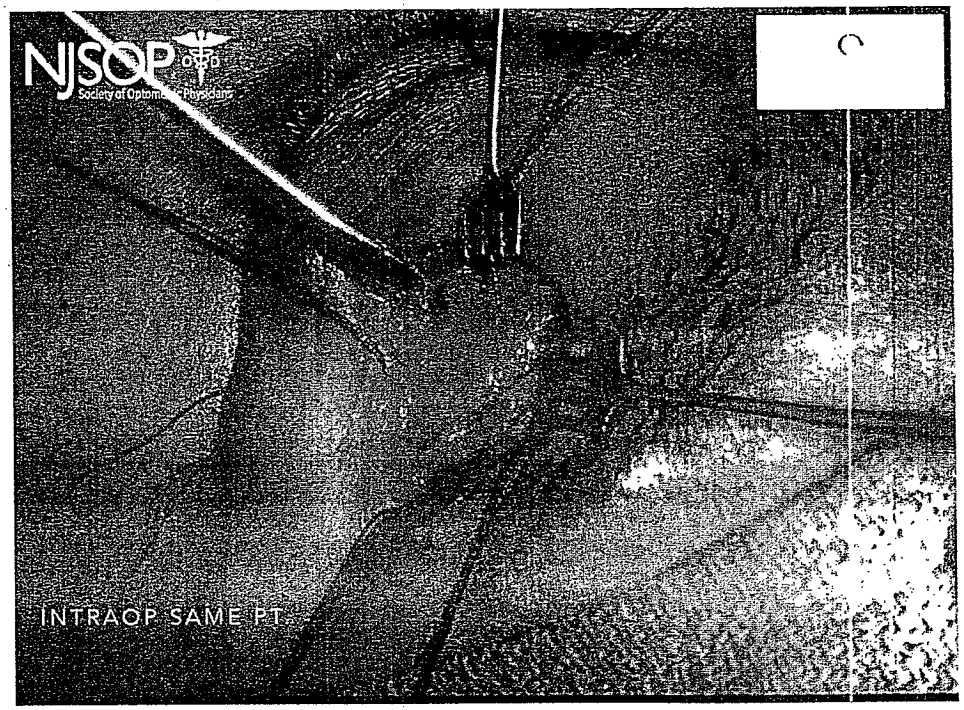

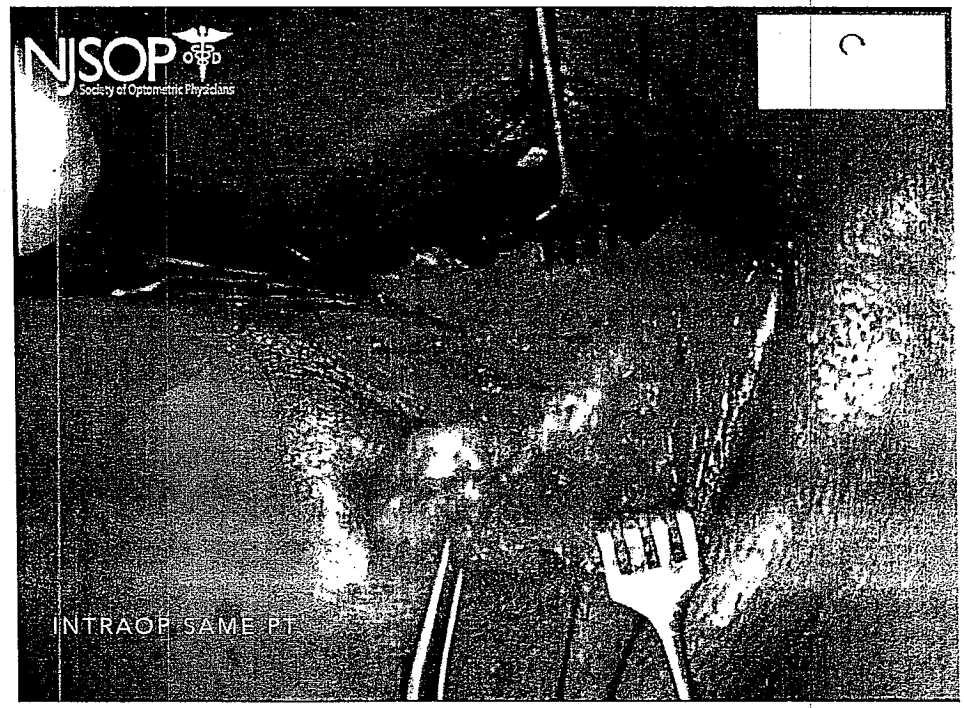

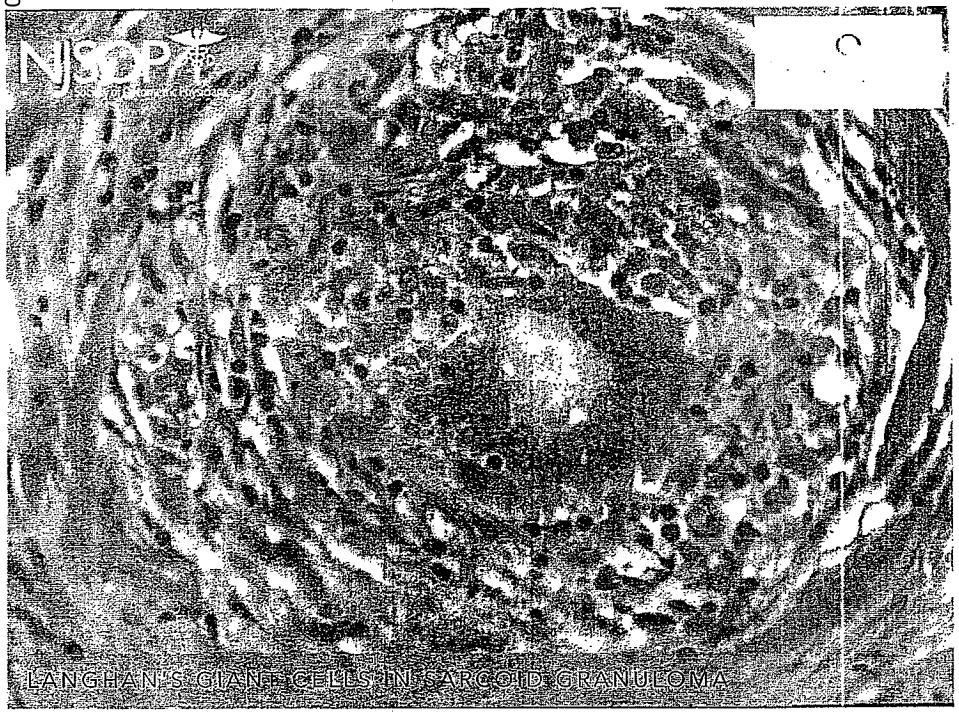

NJSOP
Society of Optometric Physicians

D/D

- SYSTEMIC INFLAMMATORY DISEASES (CONTD..)
  - CROHN'S DISEASE
  - SYSTEMIC LUPUS ERYTHEMATOSIS
  - HISTIOCYTOSIS X
  - GIANT CELL ARTERITIS
  - IDIOPATHIC FIBROSCLEROTIC DISORDERS
  - PERIARTERITIS NODOSA
  - SCLERODERMA
  - SCLEROSING CHOLANGITIS

NJSOP Society of Optometric Physicians

D/D

- NEOPLASM
  - LYMPHOMA
  - LYMPHOPROLIFERATIVE DISORDERS
  - RHABDOMYOSARCOMA
  - CHOROIDAL MALIGNANT MELANOMA WITH EXTRASCLERAL SPREAD
  - METASTATIC DISEASE
- CONGENITAL MALFORMATION
  - DERMOID CYST
  - LYMPHANGIOMA
- INFECTIOUS DISEASE
- TRAUMA

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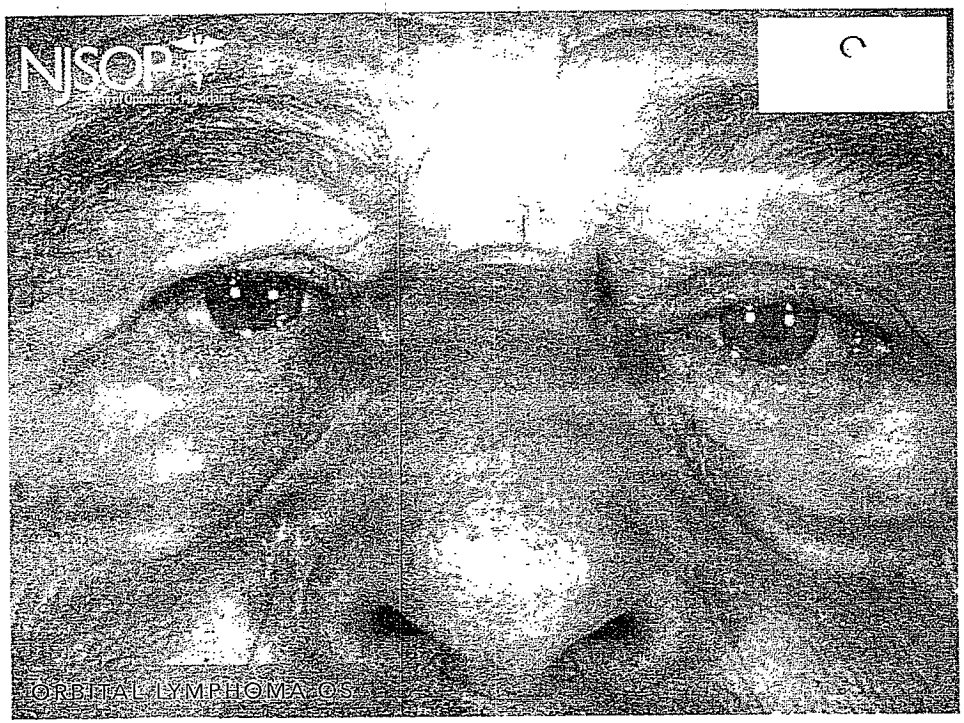
ORBITAL & ADNEXAL LYMPHOPROLIFERATIVE DISEASE

- THREE GENERAL CATEGORIES
  - BENIGN (REACTIVE) LYMPHOID HYPERPLASIA
  - **ATYPICAL LYMPHOID HYPERPLASIA**
  - MALIGNANT LYMPHOMA
- BENIGN LESIONS ARE POLYCLONAL; MALIGNANT LESIONS ARE MONOCLONAL
- ALH – MAY REPRESENT A GROUP OF TUMORS WHICH ARE "BORDERLINE" OR INCIPIENT MALIGNANCIES

NJSOP



ORBITAL LYMPHOMA OS

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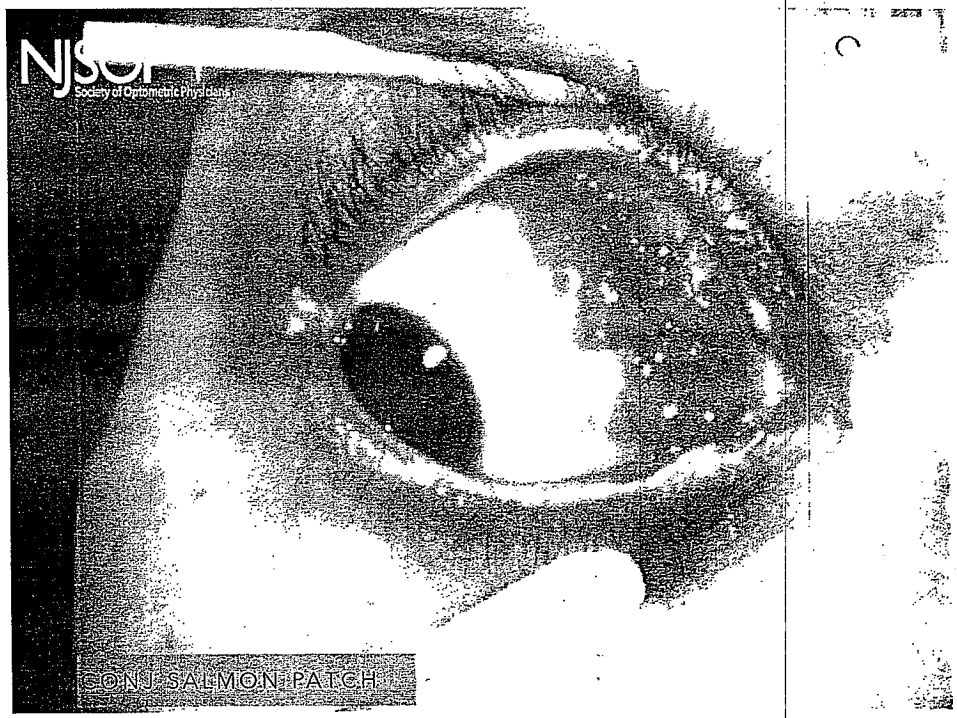
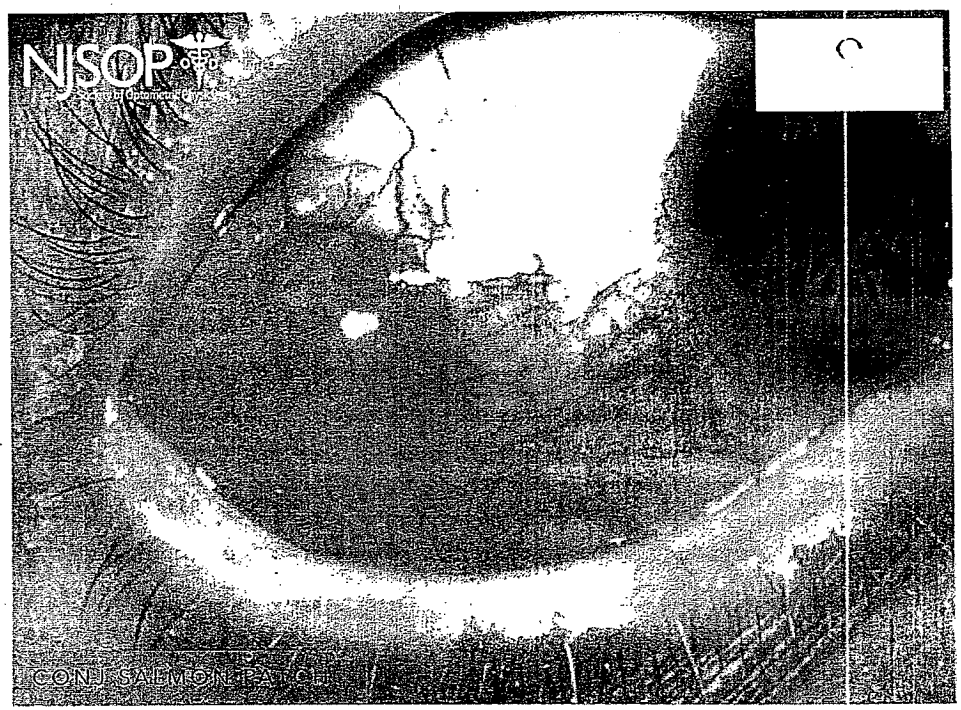
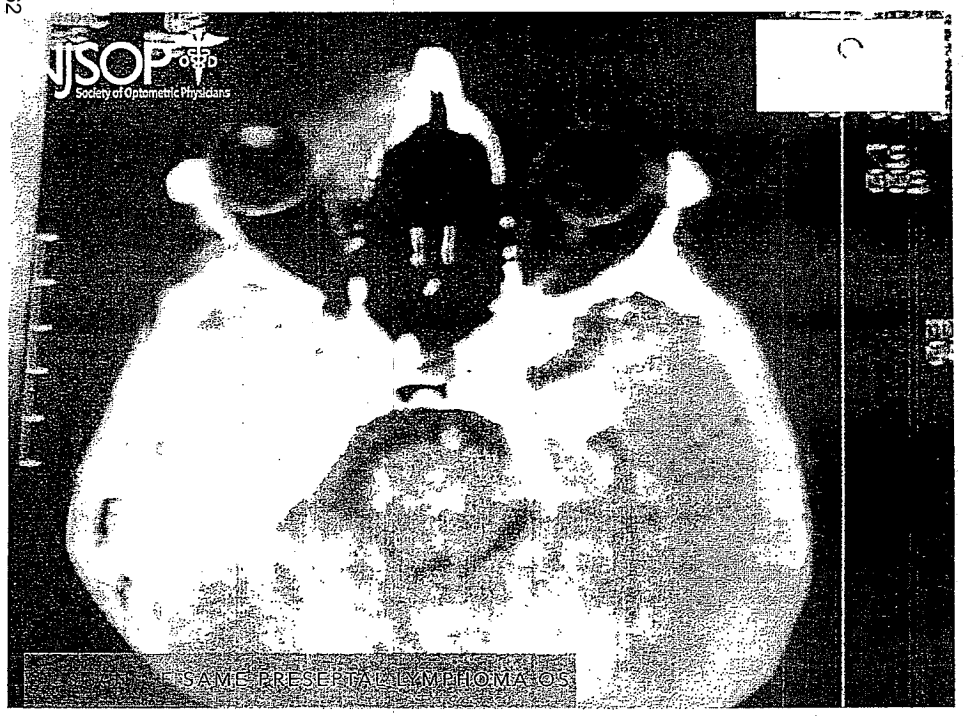


CONJ SALMON PATCH





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TESTING

- BLOOD-WORK
  - CBC, ESR, CRP
  - ANA, ANCA, RF
  - SERUM PROTEIN ELECTROPHORESIS, ACE
  - THYROID PROFILE AS NOTED ABOVE
- CXR OR CT CHEST SARCOIDOSIS OR CONGENITAL
- ORBITAL ULTRASONOGRAPHY
  - INSERTIONS OF EXTRAOCULAR MUSCLES
  - EXTRASCLERAL EXPANSION OF INTRAOCULAR TUMORS,
  - IDENTIFYING ENLARGEMENT AND INTERNAL REFLECTIVITY OF LACRIMAL GLAND TUMORS

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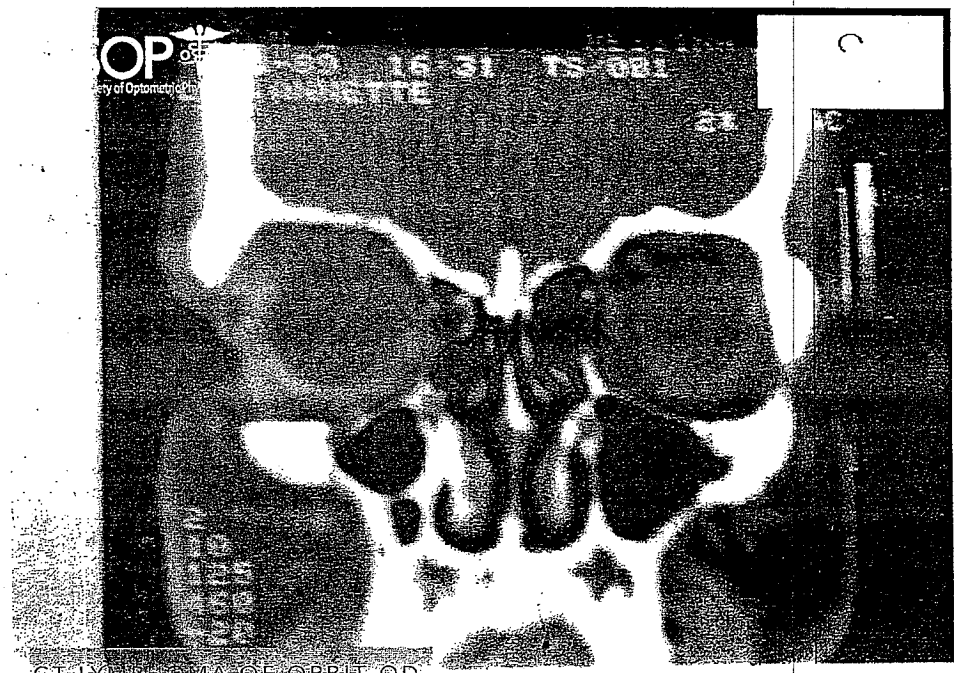
RADIOLOGY

* LACRIMAL GLAND ENLARGEMENT WITH ILL-DEFINED BORDERS: ISOLATION OR WITH CHANGES IN OTHER ORBITAL STRUCTURES.
* ORBITAL FAT, WHEN INVOLVED, EXHIBITS DIFFUSE OR ILL-DEFINED INFILTRATION.
* EXTRAOCULAR MUSCLE ENLARGEMENT OF THE INSERTION: DIFFERENTIATION FROM THYROID-ASSOCIATED ORBITOPATHY.
* ORBITAL APEX INFLAMMATION EITHER INFILTRATE OR MASS EFFECT.
* OPTIC NERVE: ENLARGEMENT OF THE OPTIC NERVE SHEATH WITH ASSOCIATED CHANGES IN CONTIGUOUS ORBITAL FAT.



CT LYMPHOMA OF ORBIT OD

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CT FINDINGS

ORBITAL LYMPHOPROLIFERATIVE DISEASE:

* NO DIFFERENCE BETWEEN BENIGN AND MALIGNANT LESIONS
* MOLDING OF LESIONS TO ADJACENT ORBITAL STRUCTURES
* INFILTRATE IS ISODENSE TO EXTRAOCULAR MUSCLE
* SHARP ANGULATION TO NORMAL STRUCTURES

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BIOPSY

* GENERALLY NOT REQUIRED
* DIAGNOSTIC CONCERN OR UNRESPONSIVENESS TO THERAPEUTIC INTERVENTIONS
* CAN RANGE FROM FINE-NEEDLE ASPIRATION BIOPSIES (FNAB) TO INCISIONAL OR EXCISIONAL BIOPSY
* SUSPECTED LYMPHOPROLIFERATIVE DISEASES, PATHOLOGIST ALERTED AND CONSULTED BEFORE BIOPSY TO OPTIMALLY HANDLE & DELIVER SPECIMEN
* SPECIAL PROCESSING FOR MICROBIAL IDENTIFICATION, IMMUNOLOGIC TESTING, AND RETRIEVAL OF GENETIC INFORMATION.

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HISTOPATHOLOGY TO CONFIRM

MALIGNANT LYMPHOMA W. MONOTONOUS LYMPHOCYTES

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TREATMENT

* PRESERVATION OF VISION AND ORBITAL FUNCTION
* REDUCING THE ACUTE INFLAMMATORY PROCESS.

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TREATMENT

* ANTIMICROBIAL OR ANTI-FUNGAL THERAPY: INFECTIOUS DISEASE SPECIALISTS.
* HIGH-DOSE CORTICOSTEROIDS, TYPICALLY 60–80 MG OF PREDNISONE, IS THE MAINSTAY. DRAMATIC INITIAL RESPONSE CONFIRMS DIAGNOSIS IN ACUTE OR GRANULOMATOUS DISEASE GROUPS, TAPER SLOWLY
* ADVERSE EVENTS MOOD OR WEIGHT CHANGES, HYPERGLYCAEMIA, DYSPEPSIA, OR ACCELERATED BONE CHANGES: BONE DENSITY EVALUATIONS BE PERFORMED IF NEED LONG-TERM STEROID THERAPY

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TREATMENT

* RADIATION THERAPY
  - IMPORTANT FOR METASTATIC LESIONS OR LYMPHOPROLIFERATIVE DISORDERS
  - NOT INITIAL THERAPY FOR IDIOPATHIC O.I.D.
  - LOW-DOSE RADIOTHERAPY RECURRENT MYOSITIS BUT RECURRENCES
  - THYROID ASSOCIATED ORBITOPATHY: RT MAY IMPROVE OPTIC NERVE FUNCTIONING IN COMPRESSIVE OPTIC NEUROPATHIES: CONTROVERSIAL.

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TREATMENT

- IMMUNE-MODULATING AGENTS
  - IFN-ALPHA
    - INDUCES DIFFERENTIATION OF HISTIOCYTES DENDRITIC CELLS
    - CHURG-STRAUSS SYNDROME AND ERDHEIM-CHESTER DISEASE
  - ANTI-TNF-A
    - EMERGING INCLUDING SARCOIDOSIS AND INFLAMMATORY EYE DISEASE.
    - MONOCLONAL ANTIBODIES, INFLIXIMAB & ADALIMUMAB, AND SOLUBLE TNF RECEPTOR FUSION PROTEIN, ETANERCEPT
    - WORESEN DEMYLINATION, REACTIVATE INFECTIONS

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TREATMENT

Summary

Table 2 OID: medical therapy

Agent	*Comments*
Systemic corticosteroid	Monitor bone density on long-term therapy Adverse effects include mood or weight change, hyperglycaemia, GI distress, accelerated loss of bone density
Methotrexate	Useful steroid sparing agent Folate helps minimize side effects Adverse effects include fatigue, GI distress, liver toxicity, hair loss, headaches, arthralgias
Cyclophosphamide	Cytotoxicity with haemorrhagic cyctitis, bone marrow suppression, malignancy potential
Azathioprine	Adverse effects include bone marrow suppression, GI distress, myalgias, and there is malignancy potential
Cyclosporine	Adverse effects include renal dysfunction, hyptertension, liver toxicity
Mycophenolate mofetil	Potential steroid sparing Adverse effects include haematuria, constitutional symptoms, cough, peripheral oedema, arthralgias, GI distress, haematologic abnormalities
Anti-TNF-α	Adverse effects include demyelinating disease, reactivation of infectious disease, bone marrow suppression, dermatitis, liver toxicity, potential for malignancy induction
IFN-α	Adverse events include bone marrow toxicity, fatigue, flu-like symptoms, diarrhoea, skin rash, hair loss

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ACKNOWLEDGEMENT

SPECIAL THANKS TO DR. MILITE FOR PROVIDING CASES AND GUIDANCE.

NJSOP Society of Optometric Physicians

THANK YOU

MUNISH SHARMA, MD OD FAAO

ASSISTANT PROFESSOR

College of Optometry, Western University of Health Sciences
309 E. Second St. Pomona, CA 91766
Ph: (909) 469-8486(W) (410) 205-0411(C)
Email: sharmam@westernu.edu

EDUCATION

- Residency (Refractive & Ocular Surgery/Ocular Disease) 2014, OMNI Eye Services, Iselin, NJ
- Doctor of Optometry 2013, SUNY College of Optometry, New York, NY
- Fellowship (Pediatric Ophthalmology) 2007, Children's National Medical Center at George Washington University, Washington, DC.
- Fellowship (Pediatric Ophthalmology and Adult Strabismus) 2006, Wilmer Eye Institute, Johns Hopkins University, Baltimore, MD
- Fellowship (Cornea and Refractive Surgery) 2005 UCI & Boxer Wachler Vision Institute, Beverly Hills, CA
- MD (Ophthalmology) 2004, Dr. R.P. Center of Ophthalmic Sciences, AIIMS, New Delhi, India
- MB,BS (Bachelor of Medicine, Bachelor of Surgery) 2001, All India Institute of Medical Sciences, New Delhi, India

BOARD CERTIFICATIONS

- National Board of Examiners in Optometry (NBEO) 2013 with TMOD
- Education Certificate for Foreign Medical Graduates (ECFMG) 2001 after USMLE 1,2,CSE & TOEFL

PROFESSIONAL POSITIONS

- Assistant Professor 2014, College of Optometry, Western University of Health Sciences, Pomona, CA
- Resident Optometry, OMNI eye services of NJ
- Clinical Fellow (Pediatric Ophthalmology) 2006-2007 CNMC at George Washington University, Washington, DC.
- Clinical Fellow (Pediatric Ophthalmology & Adult Strabismus) 2005- 2006, Wilmer Eye Institute at Johns Hopkins University Medical Institution, Baltimore, MD
- Clinical Fellow (Cornea and Refractive Surgery) 2004-2005, University of California Irvine and Boxer Wachler Vision Institute, Beverly Hills & Irvine, CA

TEACHING EXPERIENCE

- Course leader of Posterior Segment and Retina Course OD-IV Fall 2014 - present
- Course leader of Systemic Disease Course Fall 2015 - present
- Co-Developer of Inter-professional Education Case 4 (IPE 6100) on Toxoplasmosis: Winter 2015 - present
- Facilitator Inter-professional Education (IPE 5000/5100) Case 3 and Case 4 discussion groups Fall 2015 and Winter 2015
- NBEO review lectures on Posterior Segment and Retina for OD Class 2016
- NBEO review lecture on Pathophysiology of systemic diseases for OD Class 2016 CLINICAL STUDIES

INVITED SPEAKER

- Webinar "Advances in Retina Diagnosis and Management" June 2015
- CE Talk "Cataract Surgery Co-Management" for Luxotica Optomterist Association June 2015
- OMNI New York CE 2014 Retinal Grand Rounds
- Bergen Passaic Society of Optometric Physicians 2014, Idiopathic Orbital Inflammatory Syndrome
- Bergen Passaic Society of Optometric Physicians 2013, Retina Grand Rounds
- Hudson Valley Optometric Society 2013, Advances in AMD
- OMNI CE Event 2013, Adaptive Optics.

ACADEMIC SERVCIES

- Student Performance Committee: 2014 - present
- American Optometry Association: Evidence Based Optometry Committee member 2015 – present
- Inland Empire Optometry Society: Communication and IT Chair 2015 - present

RESEARCH TRIALS

- Co-Investigator: Maestro 4 Topcon Normative Database study for FDA approval Jan 2015- completion
- Co-Investigator NovaBay clinical trial on Blepharitis management.
- Co-Investigator in IRB approved clinical study on "Adjustable muscle surgery in pediatric patients[9]" at Wilmer Eye Institute at Johns Hopkins University Medical Institution, Baltimore, MD 2006
- Co-Investigator in clinical study "Comparison of single-segment and double-segment Intacs for keratoconus and post-LASIK ectasia[6]." at Boxer Wachler Vision Institute, Beverly Hills, CA 2005
- Co-Investigator in clinical study "Effect of inferior-segment Intacs with and without C3-R on keratoconus[5]" at Boxer Wachler Vision Institute, Beverly Hills, CA 2005
- Co-Investigator in clinical study "Intacs for Keratoconus and Lasik-Induced Ectasia. at Boxer Wachler Vision Institute, Beverly Hills, CA 2005

PROFESSIONAL SOCIETY MEMBERSHIPS

- American Academy of Optometry (Fellow) 2012- Present
- American Optometry Association 2012- Present
- California Optometry Association and Inland Empire Optometry association 2014- present
- American Academy of Ophthalmology (International Member) 2006 – present
- American Society of Cataract and Refractive Surgery 2005-2008
- American Academy Pediatric Ophthalmology and Strabismus 2006-2009

AWARDS

- Fellow of the American Academy of Optometry 2014, American Academy of Optometry, Denver, CO
- Received Irvin M Borish Student fellowship at American Academy of Optometry meeting at Seattle, WA 2013
- Represented SUNY in Prestigious Varilux Student Bowl 2012 at Optometry's Meeting in Chicago

- Recipient of Graduate Diversity scholarship, Alcon's Academy for Eye Care Excellence, Allergan AOSA Travel Grant for Essay on Dry Eye Management.
- Apple Product Professional and Apple Sales Professional by Apple Inc.
- Top rank in All India Pre-Medical and Pre-Dental Examination, 1995 (conducted by CBSE).
- Top rank in Pre-Medical Examination of Banaras Hindu University, 1995.
- Top rank in Combined Pre-Medical Test, Punjab, 1995.
- Top rank in AIIMS MBBS Entrance Examination, 1995.
- Received National Talent Search Scholarship (National Council Education Research Training), 1993.

INVITED SPEAKER

- OMNI New York CE 2014 Retinal Grand Rounds
- Bergen Passaic Society of Optometric Physicians 2014, Idiopathic Orbital Inflammatory Syndrome
- Bergen Passaic Society of Optometric Physicians 2013, Retina Grand Rounds
- Hudson Valley Optometric Society 2013, Advances in AMD
- OMNI CE Event 2013, Adaptive Optics.

PEER REVIEWED PUBLICATIONS

1. Nehmad L, Yang A, Sharma M. A Comparative Study of Methods used to evaluate Visual field Progression in Glaucoma Poster Presentation at American Academy of Optometry Annual Meeting 2013 at Seattle, WA.
2. Sharma M, Bass S, Chirumbolo A. Case of concurrent CME and Primary Open Angle Glaucoma responding positively to single medication: Topical Carbonic Anhydrase Inhibitors at American Academy of Optometry Annual Meeting 2013 at Seattle, WA.
3. Awadein A, Sharma M, Bazemore MG, Saeed HA, Guyton DL. Adjustable Suture Strabismus Surgery in infants and children J AAPOS. 2008 Dec;12(6):585-90
4. Sharma M, Boxer Wachler BS, Chan CC. Higher Order Aberrations and Relative Risk of Symptoms After LASIK. Journal of Refractive Surgery. 2007 Mar;23(3):252-6.
5. Chan CC, Sharma M, Boxer Wachler BS. Effect of inferior-segment Intacs with and without C3-R on keratoconus. J Cataract Refract Surg. 2007 Jan;33(1):75-80.
6. Sharma M, Boxer Wachler BS. Comparison of single-segment and double-segment Intacs for keratoconus and post-LASIK ectasia. American Journal of Ophthalmology. 2006 May;141(5):891-5.
7. Sharma M, Boxer Wachler BS. Intacs for Keratoconus and Lasik-Induced Ectasia. Techniques in Ophthalmology. 2004 Dec;2(4):137-141.
8. Sharma M, Guyton DL. Poster Presentation: Removable noose in adjustable surgery in strabismus. American Academy of Pediatric Ophthalmology and Strabismus Annual Meeting, 3/2006.
9. Sharma M, Guyton DL. Paper: Adjustable muscle surgery in pediatric patients. International Strabismological Association in São Paulo, Brazil, 2/2006.
10. Sharma M, Boxer Wachler BS. Paper: Corneal collagen crosslinking with riboflavin increases effect (lower L-U ratio) of single segment Intacs in post-lasik ectasia and keratoconus. American Academy of Ophthalmology Annual Meeting, 10/2005.

11. Sharma M, Boxer Wachler BS. Paper: Corneal collagen crosslinking with riboflavin for corneal stabilization. American Academy of Ophthalmology Annual Meeting, 10/2005.

12. Sharma M, Boxer Wachler BS. Paper: Establishing thresholds of post-LASIK induced aberrations in symptomatic patients. American Society of Cataract and Refractive Surgery Annual Meeting, 4/2005.

13. Sharma M, Boxer Wachler BS. Paper: Technique for bilateral simultaneous Verisyse lens implantations. American Society of Cataract and Refractive Surgery Annual Meeting, 4/2005.

14. Sharma M, Boxer Wachler BS. Paper: Treatment protocol for LASIK-induced ectasia. American Society of Cataract and Refractive Surgery Annual Meeting, 4/2005.

15. Sharma M, Boxer Wachler BS, Chao L. Paper: Intacs for keratoconus. American Society of Cataract and Refractive Surgery Annual Meeting, 4/2005.

16. Panda A, Sharma M, Madhavi P. Poster Presentation: Yet another therapy for the management of acute Hydrops. All India Ophthalmic Society Annual Meeting, 1/2004.

CALIFORNIA STATE BOARD OF OPTOMETRY

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Continuing Education Course Approval Checklist

Title: 2016 Maloney Vision Institute OD Dinner Educational Lecture
Provider Name: Gabriela Quezada

☒Completed Application
- Open to all optometrists? ☒Yes ☐No
- Maintain record agreement? ☒Yes ☐No

☒Detailed Course Description
☐PowerPoint and/or other presentation materials
☐Advertising (optional)
☒CV for EACH course instructor
☒License Verification for each course instructor
- Disciplinary History? ☐Yes ☒No

1-1335/6024088/6164379/50

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CONTINUING EDUCATION COURSE APPROVAL APPLICATION

$50 Mandatory

Pursuant to California Code of Regulations (CCR) § 1536, the Board will approve continuing education (CE) courses after receiving the applicable fee, the requested information below and it has been determined that the course meets criteria specified in CCR § 1536(g).

In addition to the information requested below, please attach a copy of the course schedule and topical outline of the subject matter. Applications must be submitted 45 days prior to the course presentation date.

Please type or print clearly.

Course Title	**Course Presentation Date**
2016 Maloney Vision Institute OD Dinner Educational Lecture	06/16/2016

Course Provider Contact Information

Provider Name

Gabriela (First) Quezada (Last) _____ (Middle)

Provider Mailing Address

Street 10921 Wilshire Blvd., Suite 900 **City** Los Angeles **State** Ca **Zip** 90024

Provider Email Address gquezada@maloneyvision.com

Will the proposed course be open to all California licensed optometrists?	☒ YES ☐ NO
Do you agree to maintain and furnish to the Board and/or attending licensee such records of course content and attendance as the Board requires, for a period of at least three years from the date of course presentation?	☒ YES ☐ NO

Course Instructor Information

Please provide the information below and attach the curriculum vitae for each instructor or lecturer involved in the course. If there are more instructors in the course, please provide the requested information on a separate sheet of paper.

Instructor Name

Robert (First) Maloney (Last) K (Middle)

License Number G71227	**License Type** _____
Phone Number (310) 208-3937	**Email Address** rm@maloneyvision.com

I declare under penalty of perjury under the laws of the State of California that all the information submitted on this form and on any accompanying attachments submitted is true and correct.

Signature of Course Provider ***Date*** 1/27/16

Form CE-01, Rev. 2/16

66 hours requested 2 hours

Robert K. Maloney MD, MA, (Oxon)

1. Cataract surgery in patients with prior refractive surgery: Consultation & Preoperative evaluation

A key part of the preoperative evaluation of these patients is determining if the visual loss is related solely to the cataract or if there is also a component of irregular astigmatism. This can be determined by obtaining old records and determining how good uncorrected vision was after the refractive surgery or by using an RPG contact lens.

Surgical planning is more challenging because IOL power calculation is less accurate. Several methods for performing IOL power calculation are reviewed, including the clinical history method and the modified Maloney method. Because of the inaccuracy in IOL power calculation it is important to choose a refractive goal that allows flexibility for enhancement if needed; for example a patient who is a high myope preoperatively would probably be a better target for mild hyperopia to avoid further flattening the central cornea. IOL power choices should be made by taking in consideration the spherical aberration induced by the original refractive surgery. Previous radial keratotomy or myopic LASIK will induce positive spherical aberration which can be compensated for by a choice of negative spherical aberration IOLs. Conversely hyperopic LASIK will result in positive spherical aberration which can be similarly compensated by the appropriate choice of IOL.

2. Cataract surgery in patients with prior refractive surgery: surgery and post-op

The surgical procedure is generally unchanged in patients with prior refractive surgery. The exception is patients with previous RK where the phaco incision needs to be placed carefully not to intersect the prior RK incisions. Sometimes this necessitates a scleral rather than a corneal incision. Patients who develop cataract associated with prior phakic IOL lens implants need explanation of the phakic intraocular lens which can be done at the time of the cataract surgery.

Postoperatively, care of these patients is different in some ways from standard cataract patients. Refraction takes longer to stabilize because corneal edema induced by the surgery will produce refractive shifts. Wound leaks can occur from incisions made for explanation of phakic IOLs or from RK incisions.

Finally, generally these patients wish to be spectacle free after cataract surgery so enhancement is often indicated. Either PRK or LASIK enhancement can be used successfully but RK or relaxing incisions are generally not recommended.

3. Indications for the use of advanced lenses and femtosecond laser in cataract surgery

Femtosecond laser is a quantum advance in the cataract surgical procedure. It offers a precise capsularexis, nuclear fragmentation, and more accurate astigmatic keratotomy. It is particularly advantageous in patients with hard lenses or patients with zonular weakness, anterior capsular fibrosis, or who at risk for an Argentinean flag sign. It is contraindicated in patients with small pupils or patients where reliable suction cannot be obtained.

Advanced intraocular lenses offer the possibility of spectacle-free vision after surgery. Toric lenses are appropriate for patients with 1.25 diopters of astigmatism or more. The Crystalens, which also has a toric version, offers good distance and intermediate vision, but limited reading vision. Multi-focal lenses offer excellent distance and close vision, but reduce quality of vision and contrast sensitivity to some degree. The balance of these relative advantages and disadvantages are covered here.

4. The Acufocus Intracorneal Inlay

The Acufocus inlay is an investigational device. It is a 3.4mm circle with a 1.4mm hole in the middle that is place in a pocket the central cornea over the pupil. It created a permanent inbuilt pinhole effect, resulting in a significant improvement in reading vision without degradation of distance vision. This device is currently in FDA trials. The latest data from the FDA phase 3 trial will be presented.

CURRICULUM VITAE

Robert Keller Maloney, M.D., M.A. (Oxon)

Personal

Birthplace:	Los Angeles, California
Present Position:	Director, Maloney Vision Institute
Address:	Maloney Vision Institute 10921 Wilshire Boulevard, Suite 900 Los Angeles, CA 90024
Telephone: Facsimile:	(310) 208-3937 (310) 208-8058
Medical Licensure:	California G071227 New York 229012-1 (Inactive)

Positions Held:

1998-Present	Director, Maloney Vision Institute
2005-Present	Clinical Professor of Ophthalmology, UCLA-David Geffen School of Medicine
1998-2004	Associate Clinical Professor of Ophthalmology, UCLA-David Geffen School of Medicine
1996 – 1998	Associate Professor of Ophthalmology, UCLA-David Geffen School of Medicine
1991 – 1996	Assistant Professor of Ophthalmology, UCLA-David Geffen School of Medicine
1999-Present	Calhoun Vision, Inc. Chief Medical Officer, 1999-present Interim Chief Executive Officer, December 2007 – April 2008

Community and Institutional Service:

1991-1998	Jules Stein Eye Institute & UCLA Dept. of Ophthalmology Committees Clinical Committee, 1991-1998 Research Committee, 1991-1998 Ophthalmology Committee, 1991-1998 Academic Appointment, Advancement & Promotion Committee, 1991-1998 Jules Stein Eye Institute Committee, 1991-1998 Resident Selection Committee, 1991-1994 Quality Assurance Committee, 1991-1998 Practice Committee, 1991-1998 Library Committee, 1994-1998
1994-1998	UCLA Committees Medical Center Infection Control Committee, 1994-1998 Office for the Protection of Research Subjects Task Force, 1995-1996
1998-2000	Lasik Institute Board of Directors
2001-Present	Good Samaritan Hospital Board of Trustees

Executive Committee, 2002-Present

2009-2011	Board of Trustees, Children Mending Hearts
2010-Present	Board of Trustees, Van Nuys Charities

Education:

Undergraduate:	A.B., Summa Cum Laude in Mathematics Harvard College Honors thesis: "Linear Representations of Finite Groups in Non-Algebraically Closed Fields." September 1976 to June 1979
Graduate Studies:	Master of Arts in Philosophy, Politics, and Economics Rhodes Scholar Magdalen College Oxford University October 1979 to June 1981
Medical School:	Doctor of Medicine University of California, San Francisco September 1981 to June 1985

Postgraduate Training

Research Fellow:	Kenneth Craik Laboratory Department of Physiology Cambridge University Cambridge, England Spring, 1985
Internship:	Department of Medicine University of California, Los Angeles June 1985 to June 1986
Residency	Wilmer Ophthalmological Institute The Johns Hopkins Hospital July 1986 to June 1989
Heed Fellow:	Cornea and Refractive Surgery Emory University Department of Ophthalmology July 1989 to June 1991

Honors and Awards

Best 34 Ophthalmologists in America. Becker's ASC Review. 2010

Top 50 World Opinion Leaders in Cataract and Refractive Surgery, 2005-2007. Nationwide readership poll of Cataract & Refractive Surgery Today
Secretariat Award, American Academy of Ophthalmology, 2003, for outstanding and valuable contributions to the American Academy of Ophthalmology and to its scientific and educational programs
Senior Achievement Award, American Academy of Ophthalmology, 2002
Lans Distinguished Refractive Surgery Award, International Society of Refractive Surgery, 2001, given annually to one surgeon worldwide for innovative contributions to the field of refractive surgery.
Pioneer in Refractive Surgery Award, Lasik Institute, 1999
Mericos Whittier Prize, Scripps Institute, 1997, awarded for outstanding achievements and contributions to the field of ophthalmology
Best Ophthalmologist in America Award, 1996. Voted one of America's top 10 refractive surgeons in a nationwide survey of eye surgeons conducted by Ophthalmology Times
The Best Doctors in America Award, Best Doctors, Inc., 1994-2015
America's Top Doctors Award, Castle Connolly Medical, Inc., 2001-2015
Honor Award, American Academy of Ophthalmology, 1993
Heed/Knapp Fellow, 1990-91
Heed Foundation Fellow, 1989-90
Rhodes Scholarship, 1979
Phi Beta Kappa Society, Harvard College (early election)
John Harvard Scholarship, for Academic Distinction, 1978
Rotary Foundation Fellowship for International Study, 1978 (declined)
Detur Prize, Harvard College, for Academic Distinction, 1977
National Merit Scholarship, 1976
Edward Whitaker Prize, Harvard College; for Academic Distinction, 1976
Sophomore Standing on admission to Harvard College (finished college in three years)
Daniel Webster Scholarship, Dartmouth College, 1976(declined)
Regents' Scholarship, University of California, 1976 (declined)

Directorships

Calhoun Vision, Inc	1999-2004
VisionRx, Inc.	1994-2004

Consultancies

Premier Laser Systems, for the development of an Erbium-YAG system for corneal refractive surgery, 1994-1998
VisionRx, Inc. for the development of ophthalmic diagnostic instruments, 1994-2004
Calhoun Vision for the development of a light adjustable intraocular lens, 1998-present
Refractec, Inc., 2001-2002
VISX, Inc. 2002-2005
Advanced Medical Optics, Inc., 2005-present
Bausch & Lomb, Inc., 2005-2007
IntraLase Corp., 2007
Presbia Corp., Medical Monitor for the FDA clinical trial of the Flexivue Microlens, 2012-present
Better Vision Network, Medical Advisory Board, 2012

Research Grants

Research to Prevent Blindness Career Development Award, 1992-1996, $140,000
Principal Investigator, Weingart Foundation grant, for purchase of excimer laser, 1991, $250,000

Professional Societies

Diplomate, American Board of Ophthalmology, 1991
American Academy of Ophthalmology
- Spokesperson, 2000-2004
- Young Ophthalmologists' Committee, 1992-1994
- Advisory Group to the Ad Hoc Committee on Organizational Design, 1991
- Chairman, Annual Meeting Program Committee for Young Ophthalmologists, 1990-1992
- Long Range Planning Committee, 1989-1992
- Quality of Care Committee, 1987-1991
- Retina Preferred Practice Pattern Subcommittee
- Refractive Errors Preferred Practice Pattern Subcommittee

American Society of Cataract and Refractive Surgery
International Society of Refractive Surgery
California Association of Ophthalmology
Max Fine Corneal Society
American-European Congress of Ophthalmic Surgery
- Board of Directors 2011-present

Peer Review Activities

Associate Editor for North America, Journal of Refractive and Corneal Surgery, 1991-1995
Editorial Board, Journal of Refractive Surgery, 1991-2011
Editorial Board, Ophthalmology Times, 1995-present
Editorial Board, Video Journal of Ophthalmology, 1999-present
Editorial Board, Eye Care Tomorrow, 2000-2002
Editorial Board, Review of Refractive Surgery, 2000-2011
Editorial Board, Eyenet, 2002-2009
Editorial Board, Cataract & Refractive Surgery Today, 2006-present
Editorial Board, Advanced Ocular Care, 2010-present
Reviewer:
- American Journal of Ophthalmology
- Ophthalmology
- Archives of Ophthalmology
- Journal of Cataract and Refractive Surgery
- Ophthalmic Surgery and Lasers
- Journal of Refractive Surgery

Patents

1. Maloney RK, Stewart JL. Method and apparatus for measuring properties of the eye using a virtual image. US Patent 5,873,832, issued 2/23/99.

2. Stewart JL, Maloney RK. Multi-functional visual testing instrument. US Patent 6,045,227, issued 4/4/00.

3. Maloney RK, Stewart JL, Truax BE. Method and apparatus for measuring properties of the eye using a virtual object. US Patent 6,059,773, issued 5/9/00.

4. Maloney RK, Stewart JL. Apparatus for evaluating the visual field of a patient. US Patent 6,206,522, issued 3/27/01.

5. Stewart JL, Maloney RK, Truax BE. Apparatus for visualizing the eye's tear film. US Patent 6,447,119, issued 9/10/2002.

6. Sandstedt CA, Jethmalani JM, Grubbs RH, Kornfeld JA, Schwartz DM, Maloney RK. Application of wavefront sensor to lenses capable of post-fabrication power modification. US Patent 6,749,632 B2, issued 6/15/04.

7. Maloney RK. Piggyback lenses. US Patent applied for.

8. Mattson MS, Kornfled JA, Schwartz DM, Maloney RK, Grubbs RH. Photochemical therapy to affect mechanical and/or chemical properties of body tissue. US Patent 8,414911 B2, issued 04/09/13.

Books

1. Maloney RK, Davidorf JM. Lasik Vision Correction. Provo, UT: MedWorld, 2000.

2. Kornmehl EW, Maloney RK, Davidorf JM. A Guide to Laser Vision Correction. Omaha, NE: Addicus Books, 2001.

Peer-Reviewed Research Papers

1. Maloney RK, Deland EC, Frey H. A natural language retrieval system for surgical records. Annals of the World Association for Medical Informatics, March, 1979.

2. Maloney RK, Mitchison GJ, Barlow HB. Limit to the detection of Glass patterns in the presence of noise. J Opt Soc Am [A] 1987; 4:2336-2341.

3. Maloney RK, Miller KM, Guyton DL. Aphakic reading adds: an error in traditional teaching. Ophthalmology 1989; 96:1253-6.

4. Maloney RK. Effect of corneal hydration and intraocular pressure on keratometric power after experimental radial keratotomy. Ophthalmology 1990; 97:927-933.

5. Maloney RK. Corneal topography and optical zone location in photorefractive keratectomy. Refract Corneal Surg 1990; 6:363-37l.

6. Lopez PF, Maloney RK, Goodman GL, Stark WJ. Subregions of differing refractive power within the clear zone after experimental radial keratotomy. Refract Corneal Surg 1991; 7:360-367.

7. Bogan SJ, Maloney RK, Drews CD, Waring GO. Computer-assisted videokeratography of corneal topography after radial keratotomy. Arch Ophthalmol 1991;109:834-841.

8. Maloney RK, Bogan SJ, Waring GO. Determination of corneal image-forming properties from corneal topography. Am J Ophthalmol 1993;115:31-41.

9. Maloney RK, Friedman M, Harmon T, Hayward M, Hagen K, Gailitis RP, Waring GO. A prototype erodible mask delivery system for the excimer laser. Ophthalmology 1993; 100:542-9.

10. Friedberg ML, Imperia PF, Maloney RK, Alcala PL, Elander R, Holland GN. Results of radial and astigmatic keratotomy by beginning refractive surgeons. Ophthalmology 1993; 100:746-51.

11. Seiler T, Reckmann W, Maloney RK. Effective spherical aberration of the cornea as a quantitative descriptor in corneal topography. J Cataract Refract Surg 1993; 19(suppl):155-165.

12. Dougherty PJ, Wellish KL, Maloney RK. Excimer laser ablation rate and corneal hydration. Am J Ophthalmol 1994; 118:169-176.

13. Brint SF, Slade SG, Maloney RK, Epstein R, Stulting RD, Thompson KP. Six-month results of the multicenter phase I study of excimer laser myopic keratomileusis. J Cataract Refract Surg 1994; 20:610-615.

14. Wellish KL, Glasgow BJ, Beltran F, Maloney RK. Corneal ectasia as a complication of repeated keratotomy surgery. Refractive Corneal Surg 1994; 10:360-64.

15. Eghbali F, Yeung KK, Maloney RK. Topographic determination of corneal asphericity and its lack of effect on the refractive outcome of radial keratotomy. Am J Ophthalmol 1995; 119:275-280.

16. Terrell J, Bechara S, Nesburn A, Waring GO, Macy J, Maloney RK. The effect of globe fixation on ablation zone centration in photorefractive keratectomy. Am J Ophthalmol 1995; 119:612-619.

17. Waring GO, O'Connell MA, Maloney RK, Hagen KB, Brint SF, Durrie DS, Gordon M, Steinert RF. Photorefractive keratectomy for myopia using a 4.5-millimeter ablation zone. J Refractive Surg 1995; 11:170-180.

18. Maloney RK, Chan WK, Steinert R, Hersh P, Summit Phototherapeutic Refractive Study Group. A multicenter trial of photorefractive keratectomy for residual myopia following previous ocular surgery. Ophthalmology 1995; 102(7):1042-52.

19. Manche EE, Judge A, Maloney RK. Lamellar keratoplasty for hyperopia. J Refractive Surg 1996; 12:42-9.

20. Maloney RK, Thompson V, Ghiselli G, Durrie D, Waring GO, O'Connell M, the Summit Phototherapeutic Keratectomy Study Group. A prospective multicenter trial of excimer laser phototherapeutic keratectomy for corneal visual loss. Am J Ophthalmol 1996; 122:149-60.

21. Chan WK, Maloney RK. Autologous keratophakia for the correction of consecutive hyperopia after myopic automated lamellar keratoplasty for myopia. J Refractive Surg 1996; 12:513-15.

22. Verdon W, Bullimore M, Maloney RK. Visual performance after photorefractive keratectomy: a prospective study. Arch Ophthalmol 1996; 114:1465-1472.

23. Manche EE, Maloney, RK. Keratomileusis in situ (automated lamellar keratoplasty) for high myopia. J Cataract Refractive Surg 1996; 22:1443-50.

24. Manche EE, Maloney RK. Astigmatic keratotomy combined with myopic keratomileusis in situ for compound myopic astigmatism. Am J Ophthalmol 1996; 122:18-28.

25. Helm C, Holland GN, Webster RG, Maloney RK, Mondino BJ. Combination intravenous ceftazidime and aminoglycosides in the treatment of pseudomonas scleritis. Ophthalmology 1997; 104:838-43.

26. Batra VN, Maloney RK. Refractive outcome of radial keratotomy: Does the result of the first eye predict the outcome of the second eye? Am J Ophthalmol 1997; 123:165-73.

27. Hagen KB, Kettering J, Aprecio R, Beltran F, Maloney RK. Lack of virus transmission by the excimer laser plume. Am J Ophthalmol 1997; 124:206-11.

28. Manche EE, Maloney RK, Smith R. Treatment of topographic islands following refractive surgery. J Cataract Refractive Surg 1998; 24:464-70.

29. Smith RJ, Chan WK, Maloney RK. The prediction of surgically induced refractive change from corneal topography. Am J Ophthalmol 1998; 125:44-53.

30. Ghiselli G, Manche EE, Maloney RK. Factors influencing the outcome of hyperopic lamellar keratoplasty. J Cataract Refractive Surg 1998; 24:35-41.

31. Hersh PS, Scher JS, Irani R, Summit PRK-LASIK Study Group. Corneal topography of photorefractive keratotectomy versus laser in situ keratomileusis. Ophthalmology 1998; 105:612-19.

32. Steinert RF, Hersh PS, Summit technology PRK-LASIK study group. Spherical and aspherical photorefractive keratectomy and laser in-situ keratomileusis for moderate to high myopia: two prospective, randomized clinical trials. Trans Am Ophthalmol Soc 1998; 96:197-221.

33. Hersh PS, Brint SF, Maloney, RK, Durrie, DS, Gordon M, Michelson, MA, Thompson VM, Berkeley RB, Schein OD, Steinert RF. Photorefractive keratectomy versus laser in situ keratomileusis for moderate to high myopia. A randomized prospective study. Ophthalmology 1998; 105(8):1512-23.

34. Smith, RJ, Maloney RK. Diffuse Lamellar Keratitis. Ophthalmology 1998; 105(9):1721-1726.

35. Faktorovich, EG, Badawi DY, Maloney RK, Ariyasu RG. Growth factor expression in corneal wound healing after excimer laser keratectomy. Cornea 1999; 18:580-588.

36. Onclinx T, Smith RJ, Maloney RK. Induced astigmatism following photorefractive keratectomy. J Cataract & Refractive Surg 1999; 25(2): 183-187.

37. Lin RT, Maloney RK. Flap complications associated with lamellar refractive surgery. Am J Ophthalmology 1999; 127(2): 129-136.

38. Faktorovich EG, Maloney RK, Price FW, Arc-T Study Group. Effect of Astigmatic Keratotomy on Spherical Equivalent: Results of the Astigmatism Reduction Trial. Am J Ophthalmology 1999; 127(3); 260-269.

39. Bullimore MA, Olson MD, Maloney RK. Visual performance after photorefractive keratectomy with a 6 mm ablation zone. Am J Ophthalmology 1999; 128:1-7.

40. Hersh PS, Abbassi BS, Summit PRK-LASIK Study Group. Surgically induced astigmatism after photorefractive keratectomy and laser in situ keratomileusis. J Cataract Refract Surg 1999; 25:389-398.

41. Manche EE, Holland GN, Maloney RK. Deep lamellar keratoplasty using viscoelastic dissection. Arch Ophthalmol 1999; 117:1561-1565.

42. Tham V, Maloney RK. Microkeratome Complications of Lasik. Ophthalmology 2000; 107:920-924.

43. Hersh PS, Steinert RF, Brint SF, Summit PRK-LASIK Study Group. Photorefractive keratectomy versus laser in situ keratomileusis: comparison of optical side effects. Ophthalmology 2000; 107:925-933.

44. Wang MY, Maloney RK. Epithelial ingrowth after LASIK. Am J Ophthalmol 2000; 129:746-751.

45. Hovanesian JA, Shah SS, Onclinx T, Maloney RK. Quantitative topographic irregularity as a predictor of spectacle corrected visual acuity after refractive surgery. Am J Opthalmol 2000; 129:752-758.

46. Alio JL, Perez-Santonja JJ, Tervo T, Tabbara KF, Vesaluoma M, Smith RJ, Maddox B, Maloney RK. Postoperative inflammation, microbial complications, and wound healing following laser in situ keratomileusis. J Refractive Surg 2000; 16:523-538.

47. Asbell PA, Maloney RK, Davidorf J, Hersh P, McDonald M, Manche E, Conductive Keratoplasty Study Group. Conductive keratoplasty for the correction of hyperopia. Trans Am Ophthalmol Soc 2001; 99:79-87.

48. Hovanesian JA, Shah SS, Maloney RK. Symptoms of dry eye and recurrent erosion syndrome after refractive surgery. J Cataract Refractive Surg 2001; 27:577-584.

49. Davidorf JM, Eghbali F, Onclinx T, Maloney RK. Effect of varying the optical zone diameter on the results of hyperopic laser in situ keratomileusis. Ophthalmology 2001; 108:1261-1265.

50. Maloney RK, Nguyen LH, John ME, Artisan Lens Study Group. The Artisan phakic intraocular lens for myopia: short-term results of a prospective multicenter study. Ophthalmology 2002; 109:1631-1641.

51. McDonald MB, Davidorf JM, Maloney RK, Manche EE, Hersh PS. Conductive keratoplasty for the correction of low to moderate hyperopia: one-year results on the first 54 eyes. Ophthalmology 2002; 109:637-650.

52. Hamilton DR, Manche EE, Rich LF, Maloney RK. Steroid induced glaucoma after laser in situ keratomileusis associated with interface fluid. Ophthalmology 2002; 109:659-665.

53. Hamilton DR, Davidorf JM, Maloney RK. Anterior ciliary sclerotomy for treatment of presbyopia: a prospective controlled study. Ophthalmology 2002; 109:1970-1977.

54. Van Horn SD, Hovanesian JA, Maloney RK. The Effect of Volatile Compounds on Excimer Laser Power Delivery. J Refractive Surg 2002; 18(5):524-528.

55. McDonald MB, Hersh PS, Manche EE, Maloney RK, Davidorf JM, Moataz S, and the Conductive Keratoplasty United States Investigators Group. Conductive Keratoplasty for the Correction of Low to Moderate Hyperopia: U.S. Clinical Trial 1-Year Results on 355 Eyes. Ophthalmology 2002; 109:1978-1990.

56. McDonald MB, Durrie DS, Asbell PA, Maloney RK, Nichamin LB. Treatment of presbyopia with conductive keratoplasty; six-month results of the United States FDA clinical trial. Cornea 2004 Oct; 23(7): 661-668.

57. Bailey MD, Olson MD, Bullimore MA, Jones LA, Maloney RK. The effect of lasik on best-corrected high and low contrast visual acuity. Optometry and Vision Science 2004; 81(5):362-368.

58. Hovanesian JA, Maloney RK. Treating astigmatism after a free lasik cap by rotating the cap. J Cataract Refractive Surg 2005; 31:1870-1876.

59. Smith RJ, Maloney RK. LASIK in patients with autoimmune diseases. J Cataract Refractive Surg 2006; 32:1292-1295.

60. Solomon R, Donnenfeld ED, Perry HD, Rubinfeld RS, Ehrenhaus M, Wittpenn JR, Solomon KD, Manche EE, Moshirfar M, Forster E, Matzkin DC, Mozayeni RM, Maloney RK. Methicillin-Resistant Staphylococcus aureus Infectious Keratitis Following Refractive Surgery. Am J Ophthalmol 2007; 143:629-634.

61. Sonmez B, Maloney RK. Central Toxic Keratopathy: Description of a syndrome in laser refractive surgery. Am J Opthalmology 2007; 143(3):420-427.

62. Stulting RD, John ME, Maloney RK, Assil KK, Arrowsmith PN, MD, Thompson VM, for the US Verisyse Study Group. Three-year Results of Artisan/Verisyse Phakic Intraocular Lens Implantation: Results of the US FDA Clinical Trial. Ophthalmology 2008; 115(3):464-472.

63. Koch DD, Maloney RK, Hardten DR, Dell S, Sweeney AD, Wang L. Wavefront-guided photorefractive keratectomy in eyes with prior radial keratotomy – multicenter study. Ophthalmology 2009; 116(9)1688-1696.

64. Liu A, Maloney RK, Manche EE. Toxic Peripheral Keratopathy: A Syndrome in Laser Refractive Surgery. J Cataract Refractive Surg 2012; 38:1684-1689.

Scientific Presentations

1. Maloney RK, Deland EC, Frey H. A natural language retrieval system for surgical records (paper). Congress of the World Association for Medical Informatics, Versailles, France, 1979.

2. Maloney RK, Stark WJ, McCally RL. Intraocular pressure mediates refractive change after radial keratotomy (paper). Wilmer Residents Association Meeting, Baltimore, MD, 1987.

3. Maloney RK, Stark WJ and McCally RL. Intraocular pressure causes refractive change after radial keratotomy (poster). Association for Research in Vision and Ophthalmology, Sarasota, FL, 1987.

4. Maloney RK, Miller KM, Guyton DL. Aphakic reading Adds: an error in classical teaching (poster). American Academy of Ophthalmology Meeting, Dallas, TX, 1987.

5. Maloney RK, Stark WJ, McCally RL. The refractive change induced by radial keratotomy is not affected by intraocular pressure (poster). American Academy of Ophthalmology Meeting, Dallas, TX, 1987.

6. Lopez PF, Maloney RK, Goodman GJ, Gottsch JD, Stark WJ. Topography of the central cornea after radial keratotomy (paper). Wilmer Residents Association Meeting, Baltimore, MD, 1988.

7. Maloney RK, Stark WJ. Changes in corneal hydration cause changes in refraction after radial keratotomy (paper). Wilmer Residents Association Meeting, Baltimore, MD, 1988.

8. Maloney RK, Stark WJ. Changes in corneal hydration cause changes in refraction after radial keratotomy in cadaver eyes (poster). Association for Research in Vision and Ophthalmology Annual Meeting, Sarasota, FL, 1988.

9. Lopez PF, Maloney RK, Goodman GL, Gottsch JD, Stark WJ. Topography of the corneal optical zone after radial keratotomy (poster). Association for Research in Vision and Ophthalmology Annual Meeting, Sarasota, FL, 1988.

10. Maloney RK, Stark WJ. Limitations of photokeratoscopy in quantifying corneal topography (paper). Contact Lens Association of Ophthalmologists/ International Society for Refractive Keratoplasty annual meeting, New Orleans, LA, 1989.

11. Maloney RK, Harmon T, Ibrahim O, Waring GO. An ablatable mask delivery system for the excimer laser (paper). International Corneal Laser Society Meeting, Sarasota, FL, 1990.

12. Maloney RK, Bogan SJ, Waring GO. Derivation of corneal refractive properties from topographic measurements (paper). Association for Research in Vision and Ophthalmology Meeting, Sarasota, FL, 1990.

13. Gailitis RP, Maloney RK, Thompson KP, Hanna KD, Samson J, Waring GO. Videokeratography in the evaluation of excimer ablated surfaces (poster). Association for Research in Vision and Ophthalmology Meeting, Sarasota, FL, 1990.

14. Bogan SJ, Maloney RK, Waring GO. Computer-assisted analysis of corneal topography after radial keratotomy (poster). Association for Research in Vision and Ophthalmology Meeting, Sarasota, FL, 1990.

15. Penney CM, Maloney RK, Gailitis RP, Thompson KP, Waring GO. Sensitivity of videokeratoscopy to errors in centration and focusing (poster). Association for Research in Vision and Ophthalmology Meeting, Sarasota, FL, 1990.

16. Maloney RK, Friedman M, Harmon T, Hayward M, Hagen K, Gailitis RP, Waring GO. A prototype ablatable mask delivery system for the excimer laser (paper). Association for Research in Vision and Ophthalmology Meeting, Sarasota, FL, 1991.

17. Maloney RK, Boleza E, King M. Corneal haze and contrast sensitivity following photorefractive keratectomy (paper). International Corneal Laser Society Meeting, Anaheim, CA, 1991.

18. Kawesch GM, Maloney RK, Derse M, Seiler T. Contour of the ablation zone after photorefractive keratectomy (paper). Association for Research in Vision and Ophthalmology meeting, Sarasota, FL, 1992.

19. Maloney RK, Hagen KB, Brint S, Caldwell D, Durrie D, Gordon M, Puliafito C, Steinert R, Waring GO. Refractive and visual results of excimer laser photorefractive keratectomy for myopia nine months after surgery (poster). Association for Research in Vision and Ophthalmology Meeting, Sarasota, FL, 1992.

20. Friedberg ML, Imperia PF, Maloney RK, Alcala PL, Elander R, Holland GN. Results of radial and astigmatic keratotomy by beginning refractive surgeons (paper). International Society of Refractive Keratoplasty Meeting, Dallas, TX, 1992.

21. Waring GO, Maloney RK, Hagen KB, Brint SF, Caldwell DR, Gordon M, Puliafito CA, et al. Refractive and visual results of a multicenter trial of excimer laser photorefractive keratectomy (paper). American Academy of Ophthalmology Meeting, Dallas, TX, 1992.

22. Dougherty PJ, Wellish KL, Maloney RK. Excimer laser ablation rate and corneal hydration (poster). Association for Research in Vision and Ophthalmology Annual meeting, Sarasota, FL, May 1993.

23. Maloney RK. Excimer laser myopic keratomileusis: Results and complications (paper). International Society of Refractive Keratoplasty Meeting, Chicago, IL, November 1993.

24. Wellish KL, Beltran F, Maloney RK. Marking the axis in astigmatic refractive surgery: Is cyclotorsion a consideration? (paper). International Society of Refractive Keratoplasty Meeting, Chicago, IL, November, 1993.

25. Wellish KL, Dougherty PJ, Maloney RK. Corneal hydration and excimer laser myopic keratomileusis (paper). International Society of Refractive Keratoplasty Meeting, Chicago, IL, November, 1993.

26. Maloney RK. Discussion of "Photorefractive Keratectomy for Myopia," by Sutton HFS et al (paper). American Academy of Ophthalmology meeting. Chicago, IL, November, 1993.

27. Verdon W, Maloney RK, Bullimore MA. Visual performance in photorefractive keratectomy: A prospective study (paper). American Academy of Optometry Meeting, Boston, MA, December 1993.

28. Helm C, Holland GN, Webster RG, Maloney RK, Mondino BJ. Treatment of pseudomonas scleritis with intravenous ceftazidime and aminoglycosides (paper). Association for Research in Vision and Ophthalmology meeting, Sarasota, FL, May 1994.

29. Wellish KL, Lesher MP, Durrie DS, Maloney RK. Astigmatic keratotomy after excimer laser photorefractive keratectomy (paper). Association for Research in Vision and Ophthalmology meeting, Sarasota, FL, May 1994.

30. Eghbali F, Yeung KK, Weissman BA, Maloney RK. Topographic determination of corneal asphericity and its effect on the refractive outcome of radial keratotomy (paper). Association for Research in Vision and Ophthalmology meeting, Sarasota, FL, May 1994.

31. Maloney RK, Ghiselli G, Thompson V, Durrie DS, and the Summit Phototherapeutic Keratectomy Study Group. A multicenter trial of excimer laser phototherapeutic keratectomy for corneal opacities and irregularities (paper). Association for Research in Vision and Ophthalmology meeting, Sarasota, FL, May 1994.

32. Bullimore MA, Verdon W, and Maloney RK. A prospective study of visual performance in photorefractive keratectomy (paper). Association for Research in Vision and Ophthalmology meeting, Sarasota, FL, May 1994.

33. Terrell J, Bechara S, Nesburn A, Waring GO, Macy J, Maloney RK. Centration of the ablation zone after photorefractive keratectomy: A comparison of two methods (paper). Association for Research in Vision and Ophthalmology meeting, Sarasota, FL, May 1994.

34. Maloney RK. Circumferential tilt can be determined from keratoscope ring images. Corneal Topography Special Interest Group Meeting (paper). Association for Research in Vision and Ophthalmology meeting, Sarasota, FL, May, 1994.

35. Maloney RK, Ghiselli G, Steinert R, Hersh P, Summit Phototherapeutic Refractive Study Group. A multi-center trial of photorefractive keratectomy for residual myopia following previous ocular surgery (paper). American Academy of Ophthalmology Annual Meeting. San Francisco, CA, November, 1994.

36. Verdon W, Bullimore MA, Maloney RK. Prospective study of vision changes one year after photorefractive keratectomy. (submitted) American Academy of Optometry Annual Meeting. San Diego, CA, December, 1994.

37. Maloney RK, Judge A. Astigmatic keratotomy combined with keratomileusis in situ for compound myopic astigmatism (paper). International Society of Refractive Keratoplasty annual meeting, San Francisco, CA, October, 1994.

38. Manche E, Judge A, Maloney RK. Automated lamellar keratectomy for hyperopia (paper). International Society of Refractive Keratoplasty annual meeting, San Francisco, CA, October, 1994.

39. Hagen K, Kettering J, Aprecio R, Beltran F, Maloney RK. Potential of virus transmission by the excimer laser (paper). International Society of Refractive Keratoplasty annual meeting, San Francisco, CA, October, 1994.

40. Maloney RK, Judge A, Manche E. Astigmatic keratotomy combined with keratomileusis in situ for compound myopic astigmatism (paper). Association for Research in Vision and Ophthalmology annual meeting, Fort Lauderdale, FL, May, 1995.

41. Manche EE, Judge A, Maloney RK. Hyperopic Lamellar Keratoplasty (paper). Association for Research in Vision and Ophthalmology annual meeting, Fort Lauderdale, FL, May, 1995.

42. Chan WK, Carones F, Maloney RK. Corneal Topographic Maps: A Comparison of Axial Curvature with True Instantaneous Curvature (paper). Association for Research in Vision and Ophthalmology annual meeting, Fort Lauderdale, FL, May, 1995.

43. Ghiselli G, Manche EE, Maloney RK. Factors that Influence the Outcome of Hyperopic Automated Lamellar Keratoplasty (paper). International Society of Refractive Surgery annual meeting, Atlanta, GA, October, 1995.

44. Smith RJ, Manche EE, Maloney. Radial Keratotomy Enhancement Following Myopic Keratomileusis In Situ (ALK) (paper). International Society of Refractive Surgery annual meeting, Atlanta, GA, October, 1995.

45. Manche EE, Elkins BS, Maloney RK. Keratomileusis In Situ (Automated Lamellar Keratoplasty) for High Myopia (paper). International Society of Refractive Surgery annual meeting, Atlanta, GA, October, 1995.

46. Maloney RK. Epithelial Ingrowth after Lamellar Refractive Surgery (paper). Summit International Laser User Congress, Palm Beach, FL, December, 1995.

47. Maloney RK, Thompson V, Ghiselli G, Durrie D, Waring GO, O'Connell M. A Prospective Multicenter Trial of Excimer Laser Phototherapeutic Keratectomy for Corneal Visual Loss (paper). Summit International Laser User Congress, Palm Beach, FL, December, 1995.

48. Manche EE, Maloney RK. Keratomileusis In Situ (Automated Lamellar Keratoplasty) for High Myopia (paper). Association for Research in Vision and Ophthalmology annual meeting, Fort Lauderdale, FL, May, 1996.

49. Smith RJ, Chan WK, Lau K, Maloney RK. Prediction of Corneal Spherical Power from Corneal Topography (paper). Association for Research in Vision and Ophthalmology annual meeting, Fort Lauderdale, FL, May, 1996.

50. Smith RJ, Manche EE, Maloney, RK. Radial Keratotomy Enhancement Following Myopic Keratomileusis In Situ (paper). International Society of Refractive Surgery annual meeting, Minneapolis, MN, July, 1996.

51. Maloney RK. Epithelial Ingrowth after Lamellar Refractive Surgery (paper). International Society of Refractive Surgery annual meeting, Chicago, IL, October, 1996.

52. Hersh PS, Berkeley RG, Brint SF, Durrie DS, Gordon M, Maloney RK, Michelson MA, Thompson VM. Photorefractive Keratectomy (PRK) and Laser Assisted In-Situ Keratomileusis on the Correction of Myopia Greater Than -6.0 Diopters (paper). American Academy of Ophthalmology annual meeting, Chicago, IL, October, 1996.

53. Smith RJ, Chan WK, Maloney RK. The Prediction of Surgically Induced Refractive Change from Corneal Topography (paper). International Society of Refractive Surgery annual meeting, Chicago, IL, October, 1996.

54. Smith RJ, Maloney RK. A New Technique for Marking the Ablation Zone for Photorefractive Keratectomy (paper). International Society of Refractive Surgery annual meeting, Chicago, IL, October, 1996.

55. Faktorovich EG, Maloney RK, Price F, the ARC-T Study Group. The Coupling Ratio in Astigmatic Keratotomy (paper). International Society of Refractive Surgery annual meeting, Chicago, IL, October, 1996.

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34. Maloney RK. The Light Adjustable Lens: The surgeon may optimize this IOL's power postoperatively. Cataract & Refractive Surgery Today 2003; 3(10):45-46

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38. Maloney RK. The Zyoptix XP: An Advance in Mechanical Microkeratome Technology. Refractive Eyecare 2005; 9(10):1, 32-36.

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40. Maloney RK. Moderator. Advanced IOLs: Panel Discussion (Part 2). Video Journal of Ophthalmology 2006; Third Quarter.

41. Maloney RK. Consultation Section: Refractive surgical problem. J Cataract Refract Surg 2007; 33(3):369-370.

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46. Maloney RK. Central Toxic Keratopathy: Description of a syndrome in laser refractive surgery. Video Journal of Ophthalmology 2007; Fourth Quarter.

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52. Maloney RK. Optimizing Cataract Surgery: Lessons from LASIK. Cataract & Refractive Surgery Today 2009; 9(10):65-66.

53. Maloney RK. Incorporating Environmental Factors Into Your Nomogram. Cataract & Refractive Surgery Today Supplement 2009; 9(10):9.

54. Maloney RK. Clinical Outcomes with the iLASIK Technology Suite. Refractive Eyecare 2009; 13(10):27.

55. Maloney RK. Response to Guell JL, Consultation Section. J Cataract Refractive Surg 2009; 35(11):2029-2030.

56. Maloney RK. Off-Label Drug Use. Letter to the Editor. Am J Ophthalmol 2010; 149(1):170.

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58. Maloney RK, Geis T. Defining Wavefront-Guided Procedures. Advanced Ocular Care Supplement 2010; 1(3):3-4.

59. Geis T, Maloney RK. Carefully Perform Slit Lamp Exam 1 Day After Cataract Surgery. Primary Care Optometry News 2010; 16(3):1,18.

60. Maloney RK. Fewer Enhancements with Femtosecond Technology. EyeWorld Supplement 2010; 13(5):10.

61. Maloney RK. Postop Day-1 Results with the iLASIK Technology Suite. Refractive Eyecare 2010; 14(2):27.

62. Maloney RK. OR Temperature Found to be Key Driver in LASIK Outcomes. Ophthalmology Times 2010; 35(10):1, 11.

63. Maloney RK. The Role of Aberrometry in LASIK. Cataract and Refractive Surgery Today 2010; 10(6):41-42.

64. Bohórquez V, Daya SM, Maloney RK, Masket S, Packer M, Rau M, Shah S. Survey of Accomodating IOL Technologies 2010; Cataract and Refractive Surgery Today Europe 2010; 5(9):1-17.

65. Geis T, Maloney RK. Refractive Lens Exchange an Option for Moderate to High Hyperopia Patients. Primary Care Optometry News 2011; 16(1):12.

66. The Best of 2010. Cataract and Refractive Surgery Today 2011; 11(1): 44-50.

67. Maloney RK. Outcomes Better Than 20/20: The New Norm. Refractive Eyecare 2011; 15(3):26.

68. Maloney RK. Light-Adjustable IOL for Correction of Spherical Refractive Errors After Cataract Surgery. EyeTube Video. BMC Today, March 2011.

Named Lectureships

1. Mericos Whittier Lecture. Scripps Institute. La Jolla, CA, March 1997.

2. Distinguished Lans Refractive Surgery Award lecture. An IOL whose power is laser-adjustable in-vivo. World Refractive Surgery annual meeting, Orlando, FL, July 2001.

3. Harold A. Stein lecture. Hollywood eyes: an ophthalmic look at tinseltown. American Academy of Ophthalmology annual meeting, New Orleans, LA, October 2004.

4. The Thomas H. Pettit Lecture: A Light Adjustable Intraocular Lens. UCLA Stein Eye Institute Clinical and Research Seminar. Los Angeles, CA, June 2015

Courses, Invited Lectures, and Symposia

1. Chairman, Section on "Brightness, adaptation, and contrast." International Conference on Vision: Coding and Efficiency. Cambridge, England, October 1987.

2. Subspecialty Certification for the Cataract Surgeon: Resident's perspective. Opening Symposium, American Academy of Ophthalmology meeting, Dallas, TX, November 1987.

3. Invited Speaker. Current concepts in ophthalmology, Vail, CO, March 1990.

4. Invited Speaker. Hellenic Ophthalmological Society meeting, Iraklion, Crete, Greece, October 1990.

5. Invited Speaker. Fundacion Oftalmologia Nacional annual meeting, Bogota, Colombia, February 1992.

6. Invited Speaker. Ophthalmology Grand Rounds, Pacific Medical Center, San Francisco, CA, April 1992.

7. Invited Speaker. American Society of Cataract and Refractive Surgery annual meeting, San Diego, CA, May 1992.

8. Invited Speaker. Operiesenden Augenarzte Deutschlands annual meeting, Nurnburg, Germany, June 1992.

9. Invited Speaker. Excimer laser course, Cedars-Sinai Medical Center, Los Angeles, CA, July 1992.

10. Invited Speaker. Excimer laser course, Cedars-Sinai Medical Center, Los Angeles, CA, January 1993.

11. Invited Speaker. Sociedad Mexicana De Lentes Intraoculares y Queratorefractiva, Tijuana, Mexico, December 1992.

12. Invited Speaker. Jules Stein Eye Institute Annual Postgraduate Seminar, UCLA, Los Angeles, CA, April 1993.

13. Invited Speaker. Visions '93 course, Ft. Lauderdale, FL, April 1993.

14. Invited Speaker. Annual Contact Lens Symposium, California Association of Optometry, Irvine, CA, May 1993.

15. Invited Speaker. Corneal Topography Special Interest Group, Association for Research and Vision in Ophthalmology meeting, Sarasota, FL, May 1993.

16. Invited Speaker. Visions '93 course, La Jolla, CA, May 1993.

17. Invited Speaker. Georgia Society of Ophthalmology annual meeting, Sea Island, GA, May 1993.
18. Invited Speaker. Egresados del Hospital General de Mexico annual meeting, Queretaro, Mexico, July 1993.

19. Invited Speaker. ASCRS Summer Symposium on Refractive Surgery. Los Angeles, CA, August 1993.

20. Course director, Summit excimer laser update (course 301). American Society of Cataract and Refractive Surgery Summer Symposium on Refractive Surgery. Los Angeles, CA, August 1993.

21. Invited Speaker. Corneal topography for the general ophthalmologist. Cedars-Sinai Medical Center, Los Angeles, CA, August 1993.

22. Invited Speaker. Excimer y otros laser en cirugia refractiva corneal. Barcelona, Spain, September 1993.

23. Invited Speaker. Visions '93 Course, Chicago, IL, September 1993.

24. Chairperson. Young Ophthalmologists Symposium. American Academy of Ophthalmology annual meeting. Chicago, IL, November 1993.

25. Invited Speaker. American Academy of Ophthalmology annual meeting. Chicago, IL, November 1993.

26. Invited Speaker. Midway Hospital Grand Rounds. Los Angeles, CA, February 1994.

27. Invited Speaker. Oregon Academy of Ophthalmology annual meeting, Portland, OR, March 1994.

28. Invited Speaker. Symposium on Laser Corneal Surgery, Research Institute of Ophthalmology, Cairo, Egypt, March 1994.

29. Visiting Professor. El-Maghraby Eye Institute, Jeddah, Saudi Arabia, March 1994.

30. Invited Speaker. Contact Lens & Anterior Segment Symposium, California Association of Optometry meeting, Monterey, CA, April 1994.

31. Invited Speaker. Ocular Symposium, Universal City, CA, April 1994.

32. Co-chairman & Moderator. Corneal Topography Special Interest Group meeting. Association for Research in Vision and Ophthalmology, Sarasota, FL, May 1994.

33. Moderator. Paper session on Photorefractive and phototherapeutic keratectomy. Association for Research in Vision and Ophthalmology meeting, Sarasota, FL, May 1994.

34. Invited Speaker. Ninth Annual Meredith Morgan Symposium, Berkeley, CA, May 1994.

35. Invited Speaker. Desert Hospital Educational Conference, Palm Springs, CA, May 1994.

36. Invited Speaker. Visions '94 course. Santa Monica, CA, June 1994.

37. Invited Speaker. Tarzana Hospital Grand Rounds, Tarzana, CA, June 1994.
38. Invited Speaker. Refractive and cataract surgery: issues and updates, Mercy General Hospital, Sacramento, CA, July 1994.

39. Visiting Professor. University of Medicine and Dentistry of New Jersey, Newark, NJ, July 1994.

40. Invited Speaker. Current concepts in cornea and refractive surgery. Cedars-Sinai Medical Center, Los Angeles, CA, August 1994.

41. Invited Speaker. California Association of Ophthalmology annual meeting, Pasadena, CA, September 1994.

42. Moderator. Refractive Surgery Symposium, California Association of Ophthalmology annual meeting, Pasadena, CA, September 1994.

43. Invited Speaker. American Academy of Ophthalmology annual meeting. San Francisco, CA, November 1994.

44. Invited Speaker. American Academy of Ophthalmology annual meeting. San Francisco, CA, November 1994.

45. Invited Speaker. Symposium on Photorefractive Keratectomy. American Academy of Optometry annual meeting. San Diego, CA, December 1994.

46. Invited Speaker. Topography Symposium, Contact Lens Association of Ophthalmologist annual meeting, Las Vegas, NV, January 1995.

47. Invited Speaker. U.C. Berkeley School of Optometry Symposium, Pomona, CA, February 1995.

48. Invited Speaker. California Optometric Association annual meeting, Sacramento, CA, March 1995.

49. Invited Speaker. Salzburger Ophthalmologisches Symposium. Salzburg, Austria, April 1995.

50. Invited Speaker. Ocular Symposium. Universal City, CA, April 1995.

51. Invited Speaker. Instituto de Molestias Oculares, Associacao Brasileira de Bancos de Olhos e Transplante de Cornea, Sao Paulo, Brazil, May 1995.

52. Co-Chairman and Moderator. Corneal Topography Special Interest Group meeting. Association for Research in Vision and Ophthalmology. Fort Lauderdale, FL, May 1995.

53. Moderator. Paper Session on Refractive Surgery. Association for Research in Vision and Ophthalmology meeting. Sarasota, FL, May 1995.

54. Invited Speaker. Orange County Society of Ophthalmology. Orange, CA, May 1995.

55. Invited Speaker. Ventura County Ophthalmology Society. Camarillo, CA, June 1995.

56. Invited Speaker. Current Ophthalmic Practice Program, Cottage Hospital. Santa Barbara, CA, June 1995.

57. Invited Speaker. San Fernando Valley Optimetric Association meeting. San Fernando Valley, CA, July 1995.

58. Invited Speaker. Daniel Freeman Marina Hospital. Marina Del Rey, CA, July 1995.

59. Invited Speaker. XXVIII Congresso Brasileiro de Oftalmologia. Salvador de Bahia, Brazil, September 1995.

60. Course Director. Excimer laser photorefractive keratectomy (certification course). Jules Stein Eye Institute, UCLA, Los Angeles, CA, November 1995.

61. Invited Speaker. Photorefractive keratectomy (certification course). Washington, DC, November 1995.

62. Invited Speaker. The Seventh Annual Berkeley Practicum. Berkeley, CA, December 1995.

63. Course Director. Excimer laser photorefractive keratectomy (certification course). Jules Stein Eye Institute, UCLA, Los Angeles, CA, December 1995.

64. Instructor. Corneal topography workshop. Summit International Laser User Congress. Palm Beach, FL, December 1995.

65. Course Director. Excimer laser photorefractive keratectomy (certification course). Jules Stein Eye Institute, UCLA, Los Angeles, CA, January 1996.

66. Invited Lecturer. Morton D. Sarver Lecture Series. University of California, Berkeley School of Optometry. Berkeley, CA, January 1996.

67. Invited Lecturer. JSEI Current Ophthalmic Practice symposium. Las Vegas, NV, February 1996.

68. Invited Speaker. Third Annual Continuing Education in Southern California Lectureship and Symposium. Pomona, CA, February 1996.

69. Course Director. Photorefractive keratectomy (optometric didactic course). Los Angeles, CA, February 1996.

70. Invited Lecturer. Excimer Laser PRK Track. California Optometric Association meeting. Anaheim, CA, March 1996.

71. Course Director. Photorefractive keratectomy (optometric didactic course). Los Angeles, CA, March 1996.

72. Lecturer. Max Fine Cornea Society meeting. San Diego, CA, March 1996.

73. Visiting Professor. Stanford University. Stanford, CA, April 1996.

74. Moderator. Association for Research in Vision Ophthalmology meeting. Sarasota, FL, April 1996.

75. Visiting Professor. University of California San Francisco, San Francisco, CA, May 1996.

76. Invited Speaker. University of Michigan, Department of Ophthalmology annual meeting. Ann Arbor, MI, May 1996.

77. Visiting Professor. Sinai Hospital of Baltimore, MD, May 1996.

78. Invited Speaker. Internationales Symposium und Ausetellung, 9th annual meeting of German Ophthalmic Surgeons. Nürnberg, Germany, June 1996.

79. Invited Speaker. Myopia for the Year 2000 course. Jules Stein Eye Institute, University of California Los Angeles, Los Angeles, CA, July 1996.

80. Course Director. Photorefractive keratectomy (certification course). Jules Stein Eye Institute, University of California, Los Angeles, CA, September 1996.

81. Invited Speaker. Ocular Surgery International course. Facultad de Medicina, Universidad del Salvador. Buenos Aires, Argentina, September 1996.

82. Special Invited Speaker. 62nd Annual Meeting of the Mid-Japan Ophthalmological Society. Osaka, Japan, October 1996.

83. Invited Speaker. American Academy of Ophthalmology: Subspeciality Day. Chicago, IL, October 1996.

84. Instructor. Laser in situ keratomileusis (skills transfer course). American Academy of Ophthalmology. Chicago, IL, October 1996.

85. Invited Speaker. Research Study Club of Los Angeles annual meeting. Los Angeles, CA, February 1997.

86. Invited Speaker. Advances in refractive surgery. Cleveland Clinic Foundation, Cleveland, OH, February 1997.

87. Visiting Professor. Manhattan Eye and Ear Hospital. New York, NY, April 1997.

88. Course Director. Photorefractive keratectomy and lasik (optometric education course). Jules Stein Eye Institute, University of California, Los Angeles, CA, May 1997.

89. Visiting Professor. Naval Regional Medical Center, San Diego, CA, June 1997.

90. Invited Speaker. San Diego County Ophthalmological Society, San Diego, CA, June 1997.

91. Featured Speaker. University of Colorado Department of Ophthalmology annual research day, Denver, CO, June 1997.

92. Invited Speaker. Santa Monica Rotary Club, Santa Monica, CA, August 1997.

93. Invited Speaker. Sally Letson Symposium, Ottawa, Ontario, Canada, September 1997.

94. Invited Speaker. Optical Society of America annual meeting, Long Beach, CA, October 1997.

95. Invited Speaker. Reshaping the future: Refractive Surgery '97. American Academy of Ophthalmology annual meeting, San Francisco, CA, October 1997.

96. Course Director. Summit excimer laser clinical technology update. American Academy of Ophthalmology annual meeting, San Francisco, CA, October 1997.

97. Course Faculty. Lamellar refractive surgery (skills transfer course). American Academy of Ophthalmology annual meeting, San Francisco, CA, October 1997.

98. Symposium Speaker. The pupil in keratorefractive surgery. American Academy of Ophthalmology annual meeting, San Francisco, CA, October 1997.

99. Discussant. Posterior corneal surface topographic changes after lasik are related to residual corneal bed Thickness. American Academy of Ophthalmology annual meeting, San Francisco, CA, October 1997.

100. Invited Speaker. University of Utah Grand Rounds. Salt Lake City, UT, November 1997.

101. Invited Lecturer. Vision Sciences meeting. Santa Fe, NM, February 1998.

102. Moderator. Ninth Annual Research and Alumni Day, Jules Stein Eye Institute, UCLA. Los Angeles, CA, March 1998.

103. Plenary Speaker. Asia Pacific Society of Cornea and Refractive Surgery annual meeting. Singapore, March 1998.

104. Invited Lecturer. Jules Stein Eye Institute annual meeting, Los Angeles, CA, April 1998.

105. Invited Speaker. Southern California Permanente Medical Group annual symposium. Anaheim, CA, May 1998.

106. Invited Speaker. Virginia Society of Ophthalmology annual meeting. Williamsburg, VA, May 1998.

107. Invited Speaker. Chicago Ophthalmological Society annual meeting, Chicago, IL, May 1998.

108. Invited Speaker. Ocular Drug and Surgical Therapy Update, Laguna Niguel, CA, June 1998.

109. Invited Speaker. Current concept in refractive and cataract surgery. Stanford University, Stanford, CA, September 1998.

110. Invited Speaker. Refractive surgery risk management. The New England Ophthalmological Society annual meeting. Boston, MA, October 1998.

111. Invited Panelist. Refractive Surgery 1998: Reshaping the future. American Academy of Ophthalmology annual meeting, New Orleans, LA, November 1998.

112. Moderator. 1998 Pre-Academy Conference. International Society of Refractive Surgery, New Orleans, LA, November 1998.

113. Discussant. Refractive Surgery Free Papers. American Academy of Ophthalmology annual meeting, New Orleans, LA, November 1998.

114. Instructor. Lamellar refractive surgery with a microkeratome (skills transfer course HL-214). American Academy of Ophthalmology annual meeting, New Orleans, LA, November 1998.

115. Instructor. New and emerging technologies in cataract and refractive surgery (course 624). American Academy of Ophthalmology annual meeting, New Orleans, LA, November 1998.

116. Symposium Speaker. Topography, refraction and vision after refractive surgery. A Corneal and Contact Lens Symposium in Honor of Robert B. Mandell. Berkeley, CA, November 1998.

117. Invited Speaker. Hawaii Optometric Society meeting. Honolulu, HI, February 1999.

118. Course Faculty. New and emerging technologies in cataract and refractive surgery. American Society of Cataract and Refractive Surgery annual meeting, Seattle, WA, April 1999.

119. Moderator. Session on: Refractive lasers. American Society of Cataract and Refractive Surgery annual meeting, Seattle, WA, April 1999.

120. Invited Speaker. Southern California Chapter Meeting American Society Ophthalmic Registered Nurses, Los Angeles. CA, May 1999.

121. Keynote Speaker. VISX University symposium. Irvine, CA, June 1999

122. Invited Speaker. Mexican Society of Cataract and Refractive Surgery Annual Meeting. Puerto Vallarta, Mexico, July 1999.

123. Invited Speaker. Los Angeles Times Festival of Health. Los Angeles, CA, October 1999.

124. Invited Speaker. Phakic intraocular lenses: Anterior chamber is the way to go for myopia and hyperopia. American Academy of Ophthalmology annual meeting, Orlando, FL, October 1999.

125. Instructor. Lamellar refractive surgery with a microkeratome (skills transfer course). American Academy of Ophthalmology annual meeting, Orlando, FL, October 1999.

126. Instructor. New and emerging technologies in refractive surgery (course 317). American Academy of Ophthalmology annual meeting, Orlando, FL, October 1999.

127. Invited Speaker. Refractive surgery special interest group, American Academy of Ophthalmology annual meeting, Orlando, FL, October 1999.

128. Discussant. Langenbucher A et al. Implications of the difference between intended and achieved corneal thickness after myopic lasik in-situ keratomileusis. American Academy of Ophthalmology annual meeting, Orlando, FL, October 1999.

129. Discussant. Gimbel HV et al. Postoperative corneal thinning masquerading as undercorrection or regression in LASIK surgery. American Academy of Ophthalmology annual meeting, Orlando, FL, October 1999.

130. Invited Speaker. Association of Major League Baseball Team Physicians annual meeting, Anaheim, CA, December 1999.

131. Invited Speaker. Fourteenth Annual Morton D. Sarver Lecture Series, University of California, Berkeley, CA, January 2000.

132. Invited Speaker. Research Study Club of Los Angeles Midwinter Clinical Conference, Universal City, CA, January 2000.

133. Invited Speaker. Los Angeles County Optometric Society annual meeting, Los Angeles, CA, February 2000.

134. Invited Speaker. New Orleans Academy of Ophthalmology Annual Symposium, New Orleans, LA, February 2000.

135. Guest Surgeon. Forum Internazionale Chirurgia refrattiva Approfondimenti Nuove frontiere e Complicanze, Rome, Italy, March 2000.

136. Guest Surgeon and invited speaker. Saudi Ophthalmological Society 13th Annual Scientific Meeting. Riyadh, Saudi Arabia, April 2000.

137. Invited Speaker. American Osteopathic Colleges of Ophthalmology and Otolaryngology 84th annual clinical assembly meeting. Rancho Mirage, CA, May 2000.

138. Moderator. LASIK Session. American Society of Cataract and Refractive Surgery annual meeting. Boston, MA, May 2000.

139. Course Faculty. Course 3307: New and emerging technologies in cataract and refractive surgery. American Society of Cataract and Refractive Surgery annual meeting. Boston, MA, May 2000.

140. Invited Speaker. VisionQuest annual meeting. Chicago, IL, August 2000.

141. Invited Speaker. Vision Expo 2000. Las Vegas, NV, September 2000.

142. Invited Speaker. Vision Surgery and Laser Center Continuing Education Program. San Diego, CA, October 2000.

143. Instructor. Lamellar Refractive Surgery with a Microkeratome (skills transfer course HL-158). American Academy of Ophthalmology annual meeting. Dallas, TX, October 2000.

144. Invited Speaker. Prevention and management of flap micro and macro striae. American Academy of Ophthalmology annual meeting: Subspecialty Day. Dallas, TX, October 2000.

145. Invited Speaker. Scleral relaxation. American Academy of Ophthalmology annual meeting: Subspecialty Day. Dallas, TX, October 2000.

146. Invited Speaker. Los Angeles Rotary Club. Los Angeles, CA, February 2001.

147. Invited Speaker. Hoag Memorial Hospital 552 Club. Newport Beach, CA, February 2001.
148. Invited Speaker. University of Washington Resident/Alumni Day. Seattle, WA, June 2001.

149. Invited Speaker. VisionQuest annual meeting. Chicago, IL, August 2001.

150. Invited Speaker. Diffuse lamellar keratitis. Refractive Surgery Interest Group annual meeting. New Orleans, LA, November 2001.

151. Instructor. New and emerging technologies in cataract and refractive surgery (course 168). American Academy of Ophthalmology annual meeting. New Orleans, LA, November 2001.

152. Instructor. Lasik (skills transfer course HL-370). American Academy of Ophthalmology annual meeting. New Orleans, LA, November 2001.

153. Invited Speaker. Weird complications of lasik. International Society of Refractive Surgery annual meeting. New Orleans, LA, November 2001.

154. Invited Speaker. Dallas Academy of Ophthalmology meeting. Dallas, TX, January 2002.

155. Visiting Professor. University of Texas Southwestern. Dallas, TX, January 2002.

156. Invited Speaker. The Cleveland Clinic annual meeting. Cleveland, OH, May 2002.

157. Course Faculty. Course 2206: Lasik pearls and pitfalls: a panel discussion of lasik techniques by experienced surgeons. American Society of Cataract and Refractive Surgery annual meeting, Pennsylvania, PA, June 2002.

158. Course Faculty. Course 2302: New and emerging technologies in refractive surgery. American Society of Cataract and Refractive Surgery annual meeting, Pennsylvania, PA, June 2002.

159. Invited Speaker. Los Angeles County Optometric Society annual meeting, Los Angeles, CA, February 2003.

160. Invited Speaker. Refractive surgery complications. American Society of Cataract and Refractive Surgery annual meeting, San Francisco, CA, April 2003.

161. Invited Speaker. Customvue education course. VISX, Inc., Los Angeles, CA, July 2003.

162. Invited Speaker. Customvue education course. VISX, Inc., Denver, CO, August 2003.

163. Invited Speaker. A multicenter trial of wavefront guided lasik. XXI Congress of the European Society of Cataract and Refractive Surgeons, Munich, Germany, September 2003.

164. Invited Speaker. Results of U.S. FDA reduced acuity wavefront ablation study. XXI Congress of the European Society of Cataract and Refractive Surgeons, Munich, Germany, September 2003.

165. Course Faculty. Course 36: Wavefront-guided lasik: a practical approach to diagnostic methodology and technique. XXI Congress of the European Society of Cataract and Refractive Surgeons, Munich, Germany, September 2003.

166. Invited Speaker. How to best position wavefront into a refractive practice. ASCRS Eyeworld Educational Symposium, American Academy of Ophthalmology annual meeting, Anaheim, CA, November 2003.

167. Moderator. Session II: Correction of Presbyopia. American Academy of Ophthalmology annual meeting: Subspecialty Day. Anaheim, CA, November 2003.

168. Instructor. Medical and surgical management of complications of refractive surgery (course 244). American Academy of Ophthalmology annual meeting, Anaheim, CA, November 2003.

169. Invited Speaker. Therapeutic wavefront-guided lasik. The Research Study Club of Los Angeles annual mid-winter meeting. Los Angeles, CA, January 2004.

170. Invited Lecturer. Seeing & optimized refractive corrections. 5th International Congress of Wavefront. Whistler, Canada, February, 2004.

171. Invited Speaker. Corneal Zoology. Jules Stein Eye Institute Cornea Lecture Series. Los Angeles, CA, April 2004.

172. Course Faculty. Course 3106: Lasik pearls and pitfalls: a panel discussion of lasik techniques by experienced surgeons. American Society of Cataract and Refractive Surgery annual meeting, San Diego, May 2004.

173. Invited Speaker. Point-counterpoint: wavefront-guided ablation is the key to superior visual outcomes. Academy of Ophthalmology annual meeting: Subspecialty Day. New Orleans, LA, October 2004.

174. Discussant. Refractive Surgery Free Papers. American Academy of Ophthalmology annual meeting, New Orleans, LA, October 2004.

175. Course Faculty. Course 198: Lasik pearls and pitfalls: a panel discussion of lasik techniques by experienced surgeons. American Academy of Ophthalmology annual meeting, New Orleans, LA, October 2004.

176. Course Faculty. Course 235: Presbyopia surgery techniques: pearls and pitfalls: a panel discussion of presbyopia strategies and preferred techniques by experienced surgeons. American Academy of Ophthalmology annual meeting, New Orleans, LA, October 2004.

177. Invited Speaker. "Hollywood eyes: Can we learn anything from tinseltown?" Cataract, Cornea and Refractive Surgery Symposim annual meeting, San Francisco, CA, February 2005.

178. Invited Speaker. Refractive Surgery Complications Symposium. American Society of Cataract and Refractive Surgery annual meeting, Washington, D.C., April 2005.

179. Chair. EyeWorld Educational Symposium: Building a wavefront-driven refractive practice: optimizing results, expanding indications & apply the latest technology. American Society of Cataract and Refractive Surgery annual meeting, Washington, D.C., April 2005.

180. Invited Speaker. Corneal Zoology. Jules Stein Eye Institute Cornea Lecture Series. Los Angeles, CA, April 2005.

181. Invited Speaker. Do we fully understand the outcomes of presbyopia surgery? American Academy of Ophthalmology annual meeting. Subspecialty Day, Chicago, IL, October 2005.

182. Discussant. Phakic IOLS: Taken to Court: Panel discussion. American Academy of Ophthalmology annual meeting. Subspecialty Day, Chicago, IL, October 2005.

183. Moderator. Redefining Visual Quality Expectations for High Myopia w/Wavefront Driven Ablations: Panel discussion. AMO, Inc. American Academy of Ophthalmology annual meeting, Chicago, IL, October 2005.

184. Moderator, Invited Speaker, and Invited Panelist. Redefining Lenticular Refractive Surgery. EyeWorld Educational Symposium, American Academy of Ophthalmology annual meeting, Chicago, IL, October 2005.

185. Invited Speaker. CustomVue educational course: Optimizing Outcomes in a CustomVue-Driven Practice. Beverly Hills, CA, December 2005.

186. Course Director. Bausch & Lomb Zyoptix XP Microkeratome Certification Course. American Academy of Ophthalmology annual meeting, Chicago, IL, October 2005.

187. Moderator. Debating Today's Refractive Controversies: Panel discussion. Whistler Advanced Refractive Surgery Congress, Whistler, BC, Canada, February 2006.

188. Invited Speaker. High Myopia – Corneal vs. Lenticular Correction. Whistler Advanced Refractive Surgery Congress, Whistler, BC, Canada, February 2006.

189. Invited Panelist. "In the Clinic with the Experts" Symposium. American Society of Cataract and Refractive Surgery annual meeting, San Francisco, CA, March 2006.

190. Invited Speaker. Cornea, Cataract and Refractive Surgery Symposium, San Francisco, CA, March 2006.

191. Invited Speaker. Phakic IOL/High Myopia Correction. Cataract and Surgery Today Meeting. American Society of Cataract and Refractive Surgery annual meeting, San Francisco, CA, March 2006.

192. Invited Speaker. Corneal Zoology. Jules Stein Eye Institute Cornea Lecture Series, Los Angeles, CA, April 2006.

193. Invited Panelist. Laser Vision Correction. AMO Analyst Discussion Meeting, Huntington Beach, CA, June 2006.

194. Invited Speaker. Treatment of Erroneous Off-Axis Ablations. American Academy of Ophthalmology annual meeting, Las Vegas, NV, November 2006.

195. Instructor. Bausch & Lomb Certification Course: Advanced Laser Eye Surgery. American Academy of Ophthalmology annual meeting, Las Vegas, NV, November 2006.

196. Moderator and Invited Speaker. Evolution of the Microkeratome. Bausch & Lomb Booth Lecture. American Academy of Ophthalmology annual meeting, Las Vegas, NV, November 2006.

197. Invited Speaker. Avoiding & Managing Medical Malpractice in Refractive Surgery. Hawaiian Eye 2007, Kauai, HI, January 2007. Awarded Speaker of the Day.

198. Invited Speaker. Achieving Optimal Flaps with a Mechanical Microkeratome. Hawaiian Eye 2007, Kauai, Hi, January 2007.

199. Invited Speaker. High Myopia – Corneal vs. Lenticular Correction. Whistler Advanced Refractive Surgery Congress, Whistler, BC, Canada, February 2007.

200. Invited Speaker. Nomograms: Borrow with Care. Whistler Advanced Refractive Surgery Congress, Whistler, BC, Canada, February 2007.

201. Moderator. Pursuing Refractive Success in Pseudophakic Patients. Whistler Advanced Refractive Surgery Congress, Whistler, BC, Canada, February 2007.

202. Invited Speaker. Corneal Zoology. Jules Stein Eye Institute Cornea Lecture Series, Los Angeles, CA, April 2007.

203. Invited Speaker. Pearls for Performing Wavefront-Guided Enhancements. EyeWorld Educational Symposium, American Society of Cataract and Refractive Surgery annual meeting, San Diego, CA, April 2007.

204. Invited Speaker. The Refractive Patient Who Has Never Had Surgery. "In the Clinic with the Experts" Symposium. American Society of Cataract and Refractive Surgery annual meeting, San Diego, CA, April 2007.

205. Invited Speaker. A Nomogram to Improve Flap Centration. IntraLase User Group Meeting. American Academy of Ophthalmology annual meeting, New Orleans, LA, November 2007.

206. Invited Speaker and Panelist. Break With The Experts: Nomograms. Subspecialty Day Refractive Surgery. American Academy of Ophthalmology annual meeting, New Orleans, LA, November 2007.

207. Instructor. New and Emerging Techniques in Cataract and Refractive Surgery Course. American Academy of Ophthalmology annual meeting, New Orleans, LA, November 2007.

208. Invited Speaker. Optimizing Centration of an IntraLase Flap with a Centration Nomogram. Hawaiian Eye 2008, Waikoloa, Hi, January 2008.

209. Invited Speaker. Improving Flap Biomechanics: Stability and Healing. Winter Corneal Refractive Invitational Summit 2008, Telluride, CO, February 2008.

210. Moderator. Updating the Laser Vision Correction Business Model. Winter Corneal Refractive Invitational Summit 2008, Telluride, CO, February 2008.

211. Invited Speaker. Corneal Zoology. Jules Stein Eye Institute Cornea Lecture Series, Los Angeles, CA, March 2008.

212. Instructor. Central Toxic Keratopathy: New Clinical Entity. American Society of Cataract and Refractive Surgery annual meeting, Chicago, IL, April 2008.

213. Invited Speaker. Light Adjustable Lens Practical Seminar. 21st International Congress of German Ophthalmic Surgeons, Nürnberg, Germany, June 2008.

214. Invited Speaker. Is Monovision a True Alternative to Multifocal IOL Implantation? 21st International Congress of German Ophthalmic Surgeons, Nürnberg, Germany, June 2008.

215. Invited Panelist. Cataract Surgery and Correction of Presbyopia - Advantages of Current Surgical Techniques. 21st International Congress of German Ophthalmic Surgeons, Nürnberg, Germany, June 2008.

216. Invited Speaker. JRS Video Complications. Subspecialty Day Refractive Surgery. American Academy of Ophthalmology annual meeting, Atlanta, GA, November 2008.

217. Invited Speaker. JRS Hottest Late Breaking News. Subspecialty Day Refractive Surgery. American Academy of Ophthalmology annual meeting, Atlanta, GA, November 2008.

218. Program Committee. Jules Stein Eye Institute & ASCRS Joint Symposium on Cataract and Refractive Surgery, Los Angeles, CA, February 2009.

219. Invited Panelist. Ask the Experts. Jules Stein Eye Institute & ASCRS Joint Symposium on Cataract and Refractive Surgery, Los Angeles, CA, February 2009.

220. Invited Speaker. Developing a Personal Nomogram for Refractive Surgery. Jules Stein Eye Institute & ASCRS Joint Symposium on Cataract and Refractive Surgery, Los Angeles, CA, February 2009.

221. Lead Instructor. Mechanical v. Laser Flap Creation: Point/Counterpoint. Jules Stein Eye Institute & ASCRS Joint Symposium on Cataract and Refractive Surgery, Los Angeles, CA, February 2009.

222. Moderator. Excimer Lasers, Microkeratomes, and Wavefront Analyzers. Jules Stein Eye Institute & ASCRS Joint Symposium on Cataract and Refractive Surgery, Los Angeles, CA, February 2009.

223. Invited Speaker. The Light Adjustable Lens: Correction of Myopia, Hyperopia, and Astigmatism or Adjustable Monovision with the Light Adjustable Lens. Jules Stein Eye Institute & ASCRS Joint Symposium on Cataract and Refractive Surgery, Los Angeles, CA, February 2009.

224. Moderator. Debating Today's Refractive Controversies. Choosing Between Multifocal and Accommodating Lenses: What Is Your Thinking Today? Advanced Refractive Invitational Meeting, Deer Valley, CO, February 2009.

225. Invited Speaker. Nomogram Tweaks to Improve Your Results. Advanced Refractive Invitational Meeting, Deer Valley, CO, February 2009.

226. Invited Speaker. Corneal Zoology. Jules Stein Eye Institute Cornea Lecture Series, Los Angeles, CA, April 2009.

227. Invited Speaker. A Case of Advanced Diffuse Lamellar Keratitis vs Central Toxic Keratopathy. American Academy of Ophthalmology annual meeting, San Francisco, CA, October 2009.

228. Invited Panelist. Financing Ophthalmic Device Companies. Ophthalmology Innovation Summit, San Francisco, CA, October 2009.

229. Moderator and Invited Speaker. Factors Affecting Consistent High Quality Results. AMO Users Group meeting, San Francisco, CA, October 2009.

230. Invited Speaker. What's Next in Custom Ablations? AMO Users Group meeting, San Francisco, CA, October 2009.

231. Invited Speaker. Improving LASIK Screening and Evaluation Diagnostics. Review of Ophthalmology meeting, San Francisco, CA, October 2009.

232. Invited Keynote Speaker. Next Generation Wavefront Sensing. Aspen Invitational Refractive Symposium, Aspen, CO, March 2010.

233. Course Instructor. New Emerging Technologies in Cataract & Refractive Surgery. American Society of Cataract and Refractive Surgery annual meeting, Boston, MA, April 2010.

234. Lead Instructor. Niche IOLs. American Society of Cataract and Refractive Surgery annual meeting, Boston, MA, April 2010.

235. Invited Speaker. The Light Adjustable Lens. Jules Stein Eye Institute Grand Rounds, Los Angeles, CA, April 2010.

236. Invited Speaker. Corneal Zoology. Jules Stein Eye Institute Cornea Lecture Series, Los Angeles, CA, May 2010.

237. Moderator. Hot, Hotter, Hottest Late-Breaking News. Refractive Surgery 2010: Seeing is Believing. American Academy of Ophthalmology annual meeting, Chicago, IL, November 2010.

238. Invited Speaker. JRS QwikFacts. Refractive Surgery 2010: Seeing is Believing. American Academy of Ophthalmology annual meeting, Chicago, IL, November 2010.

239. Panelist. Intraocular Surgery Power Calculations. American Society of Cataract and Refractive Surgery annual meeting, San Diego, CA, March 2011.

240. Course Instructor. Current Hot Topics, Controversies, Debates, and Technologies in LASIK, PRK, and Refractive IOL Technology. American Society of Cataract and Refractive Surgery annual meeting, San Diego, CA, March 2011.

241. Program Co-Chairman. American-European Congress of Ophthalmic Surgery meeting, Orlando, FL, October 2011.

242. Moderator. The Happy Patient: New Tools to Optimize Outcomes. Refractive Surgery 2011: Precision in Vision. American Academy of Ophthalmology annual meeting, Orlando, FL, October 2011.

243. Invited Speaker. JRS QwikFacts. Refractive Surgery 2011: Precision in Vision. American Academy of Ophthalmology annual meeting, Orlando, FL, October 2011.

244. Moderator. New Technologies Session. American-European Congress of Ophthalmic Surgery Invitational Meeting, Aspen, CO, March 2012.

245. Invited Speaker. Adjustable IOL. American-European Congress of Ophthalmic Surgery Invitational Meeting, Aspen, CO, March 2012.

246. Moderator. LASIK for Pros. American-European Congress of Ophthalmic Surgery Summer Symposium, Deer Valley, UT, July 2012.

247. Invited Speaker. State of the Art LASIK: Snapshot of the Last 5 Years and Where We Are in 2012. American-European Congress of Ophthalmic Surgery Summer Symposium, Deer Valley, UT, July 2012.

248. Program Co-Chairman. American-European Congress of Ophthalmic Surgery meeting, Chicago, IL, November 2012.

249. Invited Speaker. Treating Astigmatism with Toric IOLs and Intraoperative Refractions. American-European Congress of Ophthalmic Surgery meeting, Chicago, IL, November 2012.

250. Moderator. Lens Point-Counterpoint. Refractive Surgery 2012: The Era of Lasers and Lenses. American Academy of Ophthalmology annual meeting, Chicago, IL, November 2012.

251. Moderator. New Technologies Symposium. American-European Congress of Ophthalmic Surgery Invitational Meeting, Aspen, CO, February 2013.

252. Invited Speaker. Light Adjustable IOL: A Lesson in the FDA. American-European Congress of Ophthalmic Surgery Invitational Meeting, Aspen, CO, February 2013.

253. Invited Speaker. Point-Counterpoint. Femto Won Me Over to Cataract. American-European Congress of Ophthalmic Surgery Summer Symposium, Deer Valley, UT, July 2014

254. Moderator. Corneal Video Complications Session. International Society of Refractive Surgery annual meeting, Chicago, IL, October 2014.

255. Moderator. New Technologies Symposium. American-European Congress of Ophthalmic Surgery Winter Meeting, Aspen, CO, February 2015

256. Moderator. "Pick a Lens" Symposium. American-European Congress of Ophthalmic Surgery Winter Meeting, Aspen, CO, February 2015

257. Moderator. Light Adjustable Lens Symposium. American Society of Cataract and Refractive Surgery meeting. San Diego, CA, April 2015

258. Invited Speaker. Cataract Surgery following PRK or LASIK. Bausch & Lomb Advanced Cataract Surgery Course, Orange, CA, May 2015

259. Invited Speaker. Corneal Zoology. Jules Stein Eye Institute Cornea Lecture Series. Los Angeles, CA, April 2015

260. Invited Speaker. The Light Adjustable IOL: A New Paradigm in Refractive Cataract Surgery. USC Department of Ophthalmology 40th Anniversary Symposium. Los Angeles, CA, June 2015.

261. Invited Speaker. Suturing a Capsular Tension Ring. International Society of Refractive Surgery/American Academy of Ophthalmology annual meeting, Las Vegas, NV, November 2015.

262. Moderator. New Technologies Symposium. American-European Congress of Ophthalmic Surgery Winter Meeting, Aspen, CO, February 2016

263. Invited Speaker. Cataract Challenges: Sutured IOL. American-European Congress of Ophthalmic Surgery Winter Meeting, Aspen, CO, February 2016

264. Invited Speaker. Presbyopic Inlays. A Refractive Inlay is Best for Presbyopia. American-European Congress of Ophthalmic Surgery Winter Meeting, Aspen, CO, March 2016

CALIFORNIA STATE BOARD OF OPTOMETRY

Memo

2450 Del Paso Road, Suite 105
Sacramento, CA 95834
(916) 575-7170, (916) 575-7292 Fax
www.optometry.ca.gov

To: Practice and Education Committee Members **Date:** May 27, 2016

From: Madhu Chawla, OD
Committee Chair **Telephone:** (916) 575-7170

Subject: **Agenda Item 5. – Adjournment**