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: Taste of the Islands: Patient-reported Outcomes with LASIK: Interpreting the PROWL Study

Provider Name: Coastal Vision Medical Group c/o Ms. Gina Valdemar

☑Completed Application
Open to all Optometrists? ☑Yes ☐No
Maintain Record Agreement? ☑Yes ☐No

☑Correct Application Fee

☑Detailed Course Summary

☑Detailed Course Outline

☑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
1-3322	5394304	5394304	$750

BUSINESS, CONSUMER SERVICES, AND HOUSING AGENCY — GOVERNOR EDMUND G. BROWN JR.

CALIFORNIA 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 "Taste of the Islands CE" Patient reported outcomes with LASIK: Interpreting the PROWL Study

Course Presentation Date 8:00 AM - 4:30 PM 04/30/2017

Course Provider Contact Information

Provider Name Coastal Vision Medical Group

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

Provider Mailing Address

Street 213 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

Elizabeth (First) Hofmeister (Last) Meneeley (Middle)

License Number _____ **License Type** MD, US NAVY

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* 3-17-17

COASTALVISION
Technique. Technology. Trust.

March 23, 2017

State Board of Optometry
2450 Del Paso Road, Ste. 105
Sacramento, CA 95834

RE: Late submission of CE course approval-Taste of the Islands 8 Hour CE-April 30, 2017: Five Retinal Diagnoses You Don't Want to Miss; Cataract Surgery in Patients with Corneal Pathology; Buried Treasure: Connecting the Dots to Treating Binocular Misalignment; Patient-reported Outcomes with Lasik: Interpreting the PROWL study; What We Know about Topography Guided Refractive Surgery: Case Studies in Clinical Practice; Do You See What I See?; Crosslinking for Corneal Ectasia: The Evolution of Sclera Lenses; Blink and You'll Miss It: Dry Eye in the Cosmetic Patient; Is the Symfony Toric Lens the Answer for Every Eye Condition; Should My Glaucoma Patient with a Cataract have a MIGS Surgery; Vitreous: Friend or Foe; Is it Cancer? The Optometrist Role in the Diagnosis and Management of Periocular Skin Cancer; Oral Presentations of Systemic Disease: Case Presentations; Glaucoma Management: What Should I do Next?

Dear Practice and Education committee,

I am writing this letter in regards to late submission for the multi-course symposium titled "Taste of the Islands CE" scheduled for presentation on 04/30/2017. We are short of the 45 day submission request, and wanted to include a letter for late submission with our CE approval application.

We continue to work diligently to get all required items to the board needed for CE approval in a timely manner. Due to multiple speakers at the upcoming CE, we had difficulty obtaining all the lectures to meet the submission requirement timeline and would appreciation your consideration of our continuing education approval request.

Please feel free to reach out to us with any other questions. We look forward to continued relations with the State Board of Optometry and the practice and education committee.

Sincerely,

Gina Valdemar
Affiliate Relations and Education Director
Coastal Vision Medical Group
ginavaldemar@coastal-vision.com

Schedule of Events:

7:00 am-7:50 am	Registration & Breakfast	
7:50 am-8:00 am	Dan B. Tran, MD	Welcome & Opening Remarks
8:00 am-8:25 am	Timothy You, MD	5 Retinal Diagnoses You Don't Want to Miss
8:25 am-8:50 am	Jennifer Lee Wu, MD	Cataract Surgery in Patients with Corneal Pathology
8:50 am-9:15 am	Gary Lovcik, OD	Buried Treasure: Connecting the Dots to Treating Binocular Misalignment
9:15 am-9:40 am	Elizabeth Hofmeister, MD, MC, USN	Patient-reported Outcomes with LASIK: Interpreting the PROWL Study
9:40 am-10:05 am	Dan B. Tran, MD	What We Know about Topography Guided Refractive Surgery: Case Studies in Clinical Practice
10:05 am-10:30 am	Madhu Agarwal, MD	Do You See What I See?
10:30 am-11:00 am	Break	
11:00 am-11:50 am	Jennifer Lee Wu, MD	Crosslinking for Corneal Ectasia
11:50 am-12:15 pm	Justin Kwan, OD, FAAO	The Evolution of Sclera Lenses
12:15 pm-12:40 pm	Jeffrey Joseph, MD	Blink and You'll Miss It: Dry Eye in the Cosmetic Patient
12:40 pm-1:50 pm	Lunch/Luau	
1:50 pm-2:15 pm	Dan B. Tran, MD	Is the Symfony Toric Lens the Answer for Every Eye Condition?
2:15 pm-2:40 pm	Betsy Nguyen, MD	Should My Glaucoma Patient with a Cataract have a MIGS Surgery?
2:40 pm-3:05 pm	Raj Rathod, MD, MBA	Vitreous: Friend or Foe
3:10 pm-3:35 pm	Jeffrey Joseph, MD	Is it Cancer? The Optometrist's Role in the Diagnosis and Management of Periocular Skin Cancer
3:35pm-3:40 pm	Lisa D. Garbutt, MD	Ocular Presentations of Systemic Disease: Case Presentations
4:00 pm-4:25 pm	Betsy Nguyen, MD	Glaucoma Management: What Should I Do Next?
4:25 pm-4:30 pm	Closing Remarks/Raffle	

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

COASTALVISION
Medical Group Inc.

Taste of the Islands 8 hour CE
(4 of 15 lectures)

Course Title: Patient Reported Outcomes with LASIK: Interpreting the PROWL Study

Course Presentation date: 4/30/17

Speaker: Elizabeth Hofmeister, MD, MC, USN

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

This lecture seeks to provide the attendees with information regarding patient Reported Outcomes with LASIK (PROWL) Study set forth to validate a new computer-based questionnaire to assess patient's symptoms and satisfaction after LASIK. The study results were recently published in JAMA Ophthalmology and the PROWL questionnaire is now publicly available. Key lessons learned include: the use of photos to illustrate visual symptoms helped to clarify visual symptom terms, patients tend to be more candid on anonymous, computer surveys than they are with their healthcare team, most patients reported few visual symptoms after LASIK than before, and patients were highly satisfied with their LASIK surgery

CE Credit: .50 CE Units

1 **Patient-Reported Outcomes with LASIK (PROWL Study): What Did We Learn?**

Elizabeth M. Hofmeister, MD
CAPT, MC, USN
Naval Medical Center San Diego
Refractive Surgery Advisor for Navy Ophthalmology
Assistant Professor of Surgery, Uniformed Services University

2 **Disclosures**

- The views expressed in this study are the author's and do not necessarily reflect the official policy or position of the Department of the Navy, Department of Defense, or the U.S. Government.
-
- I have no financial disclosures.
-
- My spouse has no financial disclosures.

3 **PROWL Study Objectives**

- PROWL – 1:
  - 6 month study, military patients
  - Validate computer-based questionnaire assessing patient reported outcomes before and after LASIK in military population
  - Evaluate the ease of survey administration
  - Explore the prevalence of any functional limitations and their associated factors after LASIK
  - Explore the level of patient satisfaction following LASIK surgery
- PROWL – 2:
  - 3 month study, civilian patients
  - Explore functional limitations and patient satisfaction following LASIK surgery using newly validated questionnaire

4

5 **2008 FDA LASIK Public Hearing**

- Patient experiences and reports of functional limitations secondary to LASIK
  - Glare
  - Halos
  - Dry eyes
  - Suicide secondary to depression following poor LASIK outcome
- Result: LASIK Quality of Life Collaboration Project
  - FDA/National Eye Institute (NEI)/Department of the Navy
  - PROWL-1: Navy study for questionnaire validation
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6 **PROWL Publications: Online November 2016, Hard Copy January 2017.**
Questionnaire Available for Public Use

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8 **PROWL Questionnaire**

- Anonymous to healthcare team, accessed on internet through secure login
- Composite of validated questions and new questions
  - Validated instruments
    - Ocular Surface Disease Index (OSDI): 8 items
      - Dry eye symptom questions
      - Environmental trigger questions
    - Refractive Error Quality of Life (RQL-42)
  - New instruments
    - Visual symptom questions
      - Glare, halos, ghosting, and starbursts
      - Defined and illustrated with photos
    - Satisfaction questions

9 **New Visual Symptom Questions**

- Glare
- Halos
- Starbursts
- Double images

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11 **PROWL 1 Methods: Surgical Technique**

- Four surgeons, highly standardized techniques
- Femtosecond LASIK flaps
- Two excimer platforms in use at Navy Refractive Surgery Center San Diego
  - Wavefront-guided platform
  - Wavefront-optimized platform

12 **PROWL 1 Data Collection:**
Clinic Visits and Questionnaires

13 **Study Population: Refractive Error**

14 **Lines Gained/Lost at 3 and 6 Months:**
Pre-op BCVA compared to postop BCVA

15 **Pre-op Best Corrected Visual Acuity vs. Post-op <u>Binocular</u> Uncorrected Visual Acuity**
Efficacy of All Treatments

16 **PROWL-1 Visual Symptoms**

17

18 **Prevalence of *any* Visual Symptoms:**
Baseline vs. 1, 3, and 6 months

19

20

21 **Prevalence of Preoperative Visual Symptoms**

22 **Prevalence of New Visual Symptoms at 6-months**

23 **Resolution of Pre-op Visual Symptoms**
at 6 months

24 **Summary of Visual Symptoms Findings**

- For the cohort, the prevalence of visual symptoms decreased from pre-op as compared to 6 months
- For each symptom index, up to 30% of patients reported new symptoms
-
- Up to 91 % of patients with pre-op symptoms reported resolution of those symptoms post op
-
- Very few patients noted that visual symptoms negatively impacted their daily activities.

25 **PROWL-1**
Dry Eye Signs and Symptoms

26 **Oxford Scores:**
Lissamine Green Slit Lamp Exam

27 **Ocular Surface Disease Index (OSDI)**

28 **Preoperative Ocular Surface Disease Index (OSDI) Scores**

29 **Prevalence of Subjects with Normal Pre-op OSDI Scores Who Had Worsening**

OSDI Scores at 6 Months

30 **Prevalence of Subjects with Mild/Moderate/Severe OSDI Scores Who Had Normal OSDI Scores at 6 Months**

31 **Summary of Dry Signs and Symptoms**

- For the cohort, Oxford scores worsened at one month, and the returned to preoperative scores
-
- For the cohort, OSDI scores improved from pre-op as compared to 6 months
-
- Up to 21% of patients with normal pre-op OSDI scores had mild/moderate/severe OSDI scores at 6 months
-
- 65% of patients with mild/moderate/severe OSDI scores pre-op had normal scores at 6 months

32 **Correlating Symptoms with Patient Satisfaction**

33 **PROWL 1:**
"How satisfied are you with your present vision?"

34 **PROWL 2:**
"How satisfied are you with your present vision?"

35 **Causes of post-LASIK Dissatisfaction: Literature Review**

- Dry eye symptoms
- Blurred distance vision
- Residual refractive error
- The need to wear glasses
- Visual disturbances

36 **Factors Associated with post-LASIK Dissatisfaction with Vision : PROWL Study Findings**

- ***Total number of dissatisfied subjects was too small to have enough statistical power to assess associated factors***
- 16 out of 496 subjects (PROWL-1 & -2): 3% overall
- Associations
  - Uncorrected vision 20/40 or worse
  - Residual myopia > 0.50 D
  - At least one visual symptom
  - Moderate to severe scores on the OSDI

37 **PROWL 1:**
"How satisfied are you with your present vision?"

38 **Satisfaction Scale:**
Higher value = Greater Satisfaction

39 **3-Month Mean Satisfaction Scores*: *Uncorrected visual acuity***

40 **3-Month Mean Satisfaction Scores*: *Use of corrective lenses***

41 **Satisfaction vs. OSDI Scores**

42 **6- month PROWL-1 Free Text Question:**
"What problems or limitations do you have because of your LASIK surgery?"

- 22 patients provided free text answers:
  - #1 answer: I now need reading glasses. (n = 8)
  - #2 answer: My eyes feel dry more often. (n = 6)
  - #3 answer: Driving at night is more difficult (n= 5)
- These patients weren't necessarily dissatisfied with their surgery or their vision
- These patients didn't necessarily tell the clinicians that they were having any issues.

43 **What Did We Learn from PROWL?**
The Questionnaire

- The PROWL questionnaire is a validated instrument to assess symptoms and satisfaction before and after LASIK
- Adding images to define visual symptoms allow patients and surgeons to "speak the same language"
- Patients admit to more symptoms on an anonymous questionnaire than they mention to the surgeon in person

44 **What Did We Learn from PROWL?**
Exploring Symptoms

- Visual symptoms:
  - Patients note a high percentage of visual symptoms preoperatively
  - The majority of patients have fewer symptoms postop
  - A small percentage of patients develop new symptoms postop
- Dry eye symptoms:
  - More patients have <u>mild-moderate-severe</u> OSDI scores preop than post op
  - More patients have <u>normal</u> OSDI scores postop than preop
  - A small percentage of patients have worse OSDI scores postop
-
-
-

45 **What Did We Learn from PROWL?**
Exploring Patient Satisfaction

-
- Very few patients were dissatisfied with their <u>post op vision</u>
  - PROWL-1 at 6 months: 6 subjects out of 216 (3%)
  - PROWL-2 at 3 months: 10 subjects out of 256 (4%)
  - There were too few dissatisfied subjects for statistical conclusions
  - Associated factors:
    - Residual refractive error
    - UCVA ≤ 20/40
    - Worse OSDI scores
    - At least one visual symptom
-
-

•

46 **Washington Post, page A20**
Thursday, November 24, 2016
Thanksgiving Day

47 **The Newspaper Headline Rewritten**

48 **Keys to Patient Satisfaction after LASIK: My personal recommendations**

- Strive for "super vision" outcomes (better than 20/20)
  - Accurate cylinder axis treatment
  - Nomogram development
- Screen carefully for dry eyes
  - Treat Meibomian dysfunction
- Counsel carefully on surgical risks and set realistic expectations
  - Underpromise/over-deliver
  - If expectations are met, satisfaction will be high
  - Even with your best efforts, there will be patients who are not satisfied

49 **Questions?**

50

Patient-Reported Outcomes with LASIK (PROWL Study): What Did We Learn?

Elizabeth M. Hofmeister, MD
CAPT, MC, USN
Naval Medical Center San Diego
Refractive Surgery Advisor for Navy Ophthalmology
Assistant Professor of Surgery, Uniformed Services University

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JAMA Ophthal. 2017(1): 3 22

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Lesson #1: It's valid!

PROWL Questionnaire

- Anonymous to healthcare team, accessed on internet through secure login

Lesson #2: Patients are more candid on anonymous surveys

- Composite of validated questions and new questions
  - Validated instruments
    - Ocular Surface Disease Index (OSDI): 8 items
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New Visual Symptom Questions

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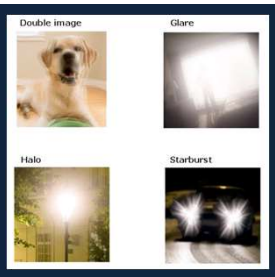

Lesson #2: Using photos to illustrate visual symptoms adds clarity to the questionnaire.

https://www.fda.gov/downloads/MedicalDevices/ProductsandMedicalProcedures/SurgeryandLifeSupport/LASIK/UCM528841.pdf

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PROWL 1 Methods: Surgical Technique

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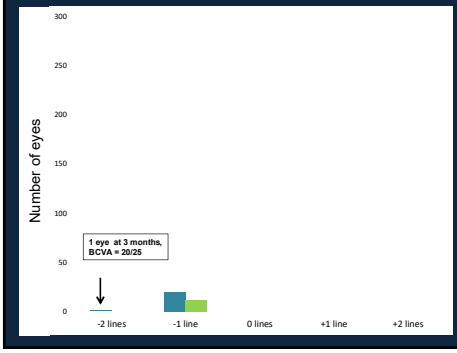
PROWL 1 Data Collection: Clinic Visits and Questionnaires

	Number (%)
Subjects enrolled	262
Subjects who underwent surgery	242
Post-op clinic visit completion rates	
1- month	234 (97%)
3- months	225 (93%)
6- months	217 (90%)
Questionnaire completion rates	
Pre-op	242 (100%)
1- month	233 (96%)
3- months	224 (93%)
6- months	217 (90%)

Study Population: Refractive Error

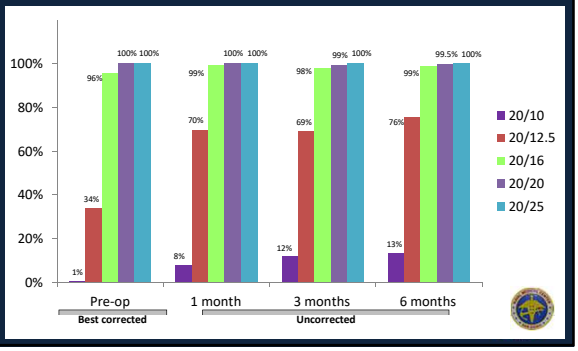
Category	Preoperative Refractive Error
Myopia n = 446 eyes	Mean sphere: -2.5 D (range 0 to -7.8 D, SD 1.71) Mean cylinder: 0.8 D (range 0 to 3.3 D, SD 0.59) Mean spherical equivalent: -2.9 D (range -0.6 to -8.0 D, SD 1.67)
Hyperopia n = 10 eyes	Mean sphere: +3.1 D (range +2.3 to +4.0 D, SD 0.64) Mean cylinder: 1.1 D (range 0.3 to 3.0 D, SD 0.89) Mean spherical equivalent: +2.5 D (range +1.5 to +3.6 D, SD 0.81)
Mixed Astigmatism n = 28	Mean sphere: +0.6 D (range +0.3 to +1.8 D, SD 0.43) Mean cylinder: 2.1 D (range 0.8 to 6.0 D, SD 1.07) Mean spherical equivalent: -0.5 D (range -2.4 to +0.3D, SD 0.62)

Lines Gained/Lost at 3 and 6 Months: Pre-op BCVA compared to postop BCVA



Pre-op Best Corrected Visual Acuity vs. Post-op Binocular Uncorrected Visual Acuity

Efficacy of All Treatments



PROWL-1 Visual Symptoms

Table 3. Visual Symptoms Reported on the Questionnaire by Participants in the Analytical Cohorts in the PROWL-1 and -2 Studies

Data on Symptoms	No./Total No. (%) of Participants[a]: Before Surgery PROWL-1	Before Surgery PROWL-2	3 mo After Surgery PROWL-1	3 mo After Surgery PROWL-2	6 mo After Surgery in PROWL-1
Symptom prevalence[b,c]					
Any type of symptom	161/240 (67.1)	199/271 (73.4)	112/224 (50.0)	154/256 (60.2)	89/216 (41.2)
Double images	72/240 (30.0)	93/271 (34.3)	15/224 (6.7)	15/256 (5.9)	13/216 (6.0)
Glare	95/240 (39.6)	102/271 (37.6)	51/224 (22.8)	68/256 (26.6)	37/216 (17.1)
Halos	99/240 (41.3)	139/271 (51.3)	82/224 (36.6)	118/256 (46.1)	60/216 (27.8)
Starbursts	120/240 (50.0)	152/271 (56.1)	77/224 (34.4)	117/256 (45.7)	68/216 (31.5)
Symptom development[b,d]					
No symptoms of any type to at least 1 symptom			32/75 (42.7)	31/68 (45.6)	26/73 (35.6)
Double images			10/156 (6.4)	5/167 (3.0)	8/153 (5.2)
Glare			23/134 (17.2)	33/159 (20.8)	16/130 (12.3)
Halos			38/127 (29.9)	50/125 (40.0)	33/126 (26.2)
Starbursts			33/114 (28.9)	36/111 (32.4)	33/109 (30.3)
Symptom resolution[b,e]					
Any type of symptom to none at all			69/149 (46.3)	63/186 (33.9)	80/143 (55.9)
Double images			61/66 (92.4)	79/89 (88.8)	57/62 (91.9)
Glare			60/88 (68.2)	60/95 (63.2)	63/84 (75.0)
Halos			48/92 (52.2)	63/131 (48.1)	62/89 (69.7)
Starbursts			62/106 (58.5)	64/145 (44.1)	69/104 (66.3)
Difficulty performing activities due to symptoms[b,f]					
Any type of symptom	18/240 (7.5)	9/271 (3.3)	1/224 (0.4)	2/256 (0.8)	4/216 (1.9)
Double images	2/240 (0.8)	3/271 (1.1)	0/224 (0.0)	0/256 (0.0)	0/216 (0.0)
Glare	7/240 (2.9)	0/271 (0.0)	1/224 (0.4)	0/256 (0.0)	1/216 (0.5)
Halos	7/240 (2.9)	4/271 (1.5)	0/224 (0.0)	1/256 (0.4)	2/216 (0.9)
Starbursts	7/240 (2.9)	6/271 (2.2)	0/224 (0.0)	1/256 (0.4)	1/216 (0.5)
"No difficulty" performing activities due to symptom[f]					
No difficulty due to any symptom	131/240 (54.6)	160/271 (59.0)	149/224 (66.5)	170/256 (66.4)	170/216 (78.7)
Double images	217/240 (90.4)	250/271 (92.3)	210/224 (93.8)	247/256 (96.5)	205/216 (94.9)
Glare	172/240 (71.7)	220/271 (81.2)	186/224 (83.0)	214/256 (83.6)	190/216 (88.0)
Halos	177/240 (73.8)	205/271 (75.6)	175/224 (78.1)	198/256 (77.3)	186/216 (86.1)
Starbursts	163/240 (67.9)	186/271 (68.6)	177/224 (79.0)	206/256 (80.5)	182/216 (84.3)

Prevalence of *any* Visual Symptoms: Baseline vs. 1, 3, and 6 months

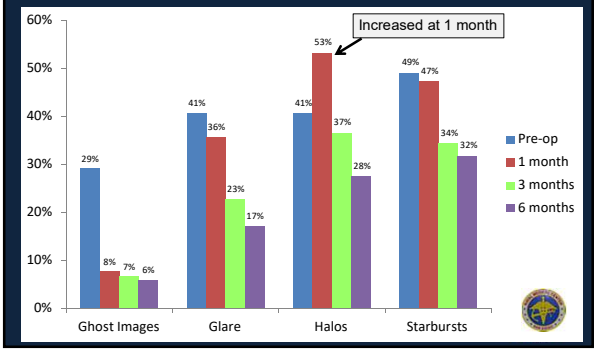


Table 3. Visual Symptoms Reported on the Questionnaire by Participants in the Analytical Cohorts in the PROWL-I and -2 Studies

Data on Symptoms	No./Total No. (%) of Participants[a]				
	Before Surgery		3 mo After Surgery		6 mo After Surgery in PROWL-1
	PROWL-1	PROWL-2	PROWL-1	PROWL-2	
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Any type of symptom	161/240 (67.1)	199/271 (73.4)	112/224 (50.0)	154/256 (60.2)	89/216 (41.2)
Double images	72/240 (30.0)	93/271 (34.3)	15/224 (6.7)	15/256 (5.9)	13/216 (6.0)
Glare	95/240 (39.6)	102/271 (37.6)	51/224 (22.8)	68/256 (26.6)	37/216 (17.1)
Halos	99/240 (41.3)	139/271 (51.3)	82/224 (36.6)	118/256 (46.1)	60/216 (27.8)
Starbursts	120/240 (50.0)	152/271 (56.1)	77/224 (34.4)	117/256 (45.7)	68/216 (31.5)
Symptom development[b,d]					
No symptoms of any type to at least 1 symptom			32/75 (42.7)	31/68 (45.6)	26/73 (35.6)
Double images			10/156 (6.4)	5/167 (3.0)	8/153 (5.2)
Glare			23/134 (17.2)	33/159 (20.8)	16/130 (12.3)
Halos			38/127 (29.9)	50/125 (40.0)	33/126 (26.2)
Starbursts			33/114 (28.9)	36/111 (32.4)	33/109 (30.3)
Symptom resolution[b,e]					
Any type of symptom to none at all			69/149 (46.3)	63/186 (33.9)	80/143 (55.9)
Double images			61/66 (92.4)	79/89 (88.8)	57/62 (91.9)
Glare			60/88 (68.2)	60/95 (63.2)	63/84 (75.0)
Halos			48/92 (52.2)	63/131 (48.1)	62/89 (69.7)
Starbursts			62/106 (58.5)	64/145 (44.1)	69/104 (66.3)
Difficulty performing activities due to symptoms[b,f]					
Any type of symptom	18/240 (7.5)	9/271 (3.3)	1/224 (0.4)	2/256 (0.8)	4/216 (1.9)
Double images	2/240 (0.8)	3/271 (1.1)	0/224 (0.0)	0/256 (0.0)	0/216 (0.0)
Glare	7/240 (2.9)	0/271 (0.0)	1/224 (0.4)	0/256 (0.0)	1/216 (0.5)
Halos	7/240 (2.9)	4/271 (1.5)	0/224 (0.0)	1/256 (0.4)	2/216 (0.9)
Starbursts	7/240 (2.9)	6/271 (2.2)	0/224 (0.0)	1/256 (0.4)	1/216 (0.5)
"No difficulty" performing activities due to symptom[f]					
No difficulty due to any symptom	131/240 (54.6)	160/271 (59.0)	149/224 (66.5)	170/256 (66.4)	170/216 (78.7)
Double images	217/240 (90.4)	250/271 (92.3)	210/224 (93.8)	247/256 (96.5)	205/216 (94.9)
Glare	172/240 (71.7)	220/271 (81.2)	186/224 (83.0)	214/256 (83.6)	190/216 (88.0)
Halos	177/240 (73.8)	205/271 (75.6)	175/224 (78.1)	198/256 (77.3)	186/216 (86.1)
Starbursts	163/240 (67.9)	186/271 (68.6)	177/224 (79.0)	206/256 (80.5)	182/216 (84.3)

Table 3. Visual Symptoms Reported on the Questionnaire by Participants in the Analytical Cohorts in the PROWL-I and -2 Studies

Data on Symptoms	No./Total No. (%) of Participants[a]				
	Before Surgery		3 mo After Surgery		6 mo After Surgery in PROWL-1
	PROWL-1	PROWL-2	PROWL-1	PROWL-2	
Symptom prevalence[b,c]					
Any type of symptom	161/240 (67.1)	199/271 (73.4)	112/224 (50.0)	154/256 (60.2)	89/216 (41.2)
Double images	72/240 (30.0)	93/271 (34.3)	15/224 (6.7)	15/256 (5.9)	13/216 (6.0)
Glare	95/240 (39.6)	102/271 (37.6)	51/224 (22.8)	68/256 (26.6)	37/216 (17.1)
Halos	99/240 (41.3)	139/271 (51.3)	82/224 (36.6)	118/256 (46.1)	60/216 (27.8)
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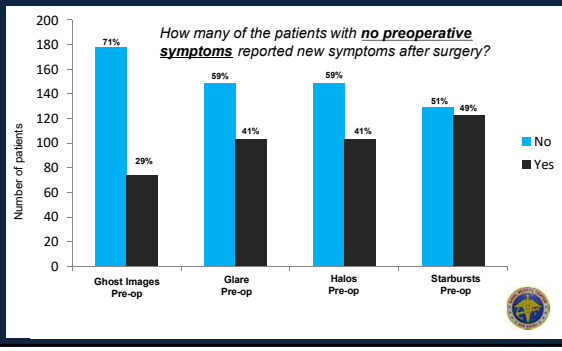
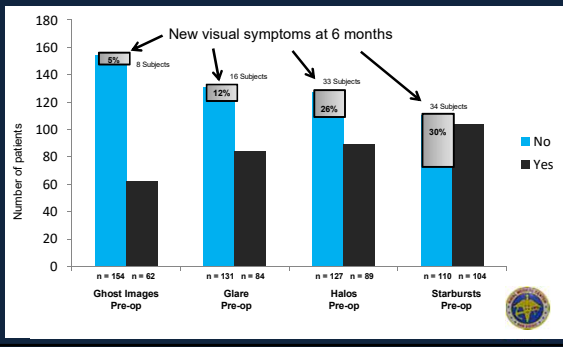
Symptom development[b,d]					
No symptoms of any type to at least 1 symptom			32/75 (42.7)	31/68 (45.6)	26/73 (35.6)
Double images			10/156 (6.4)	5/167 (3.0)	8/153 (5.2)
Glare			23/134 (17.2)	33/159 (20.8)	16/130 (12.3)
Halos			38/127 (29.9)	50/125 (40.0)	33/126 (26.2)
Starbursts			33/114 (28.9)	36/111 (32.4)	33/109 (30.3)
Symptom resolution[b,e]					
Any type of symptom to none at all			69/149 (46.3)	63/186 (33.9)	80/143 (55.9)
Double images			61/66 (92.4)	79/89 (88.8)	57/62 (91.9)
Glare			60/88 (68.2)	60/95 (63.2)	63/84 (75.0)
Halos			48/92 (52.2)	63/131 (48.1)	62/89 (69.7)
Starbursts			62/106 (58.5)	64/145 (44.1)	69/104 (66.3)
Difficulty performing activities due to symptoms[b,f]					
Any type of symptom	18/240 (7.5)	9/271 (3.3)	1/224 (0.4)	2/256 (0.8)	4/216 (1.9)
Double images	2/240 (0.8)	3/271 (1.1)	0/224 (0.0)	0/256 (0.0)	0/216 (0.0)
Glare	7/240 (2.9)	0/271 (0.0)	1/224 (0.4)	0/256 (0.0)	1/216 (0.5)
Halos	7/240 (2.9)	4/271 (1.5)	0/224 (0.0)	1/256 (0.4)	2/216 (0.9)
Starbursts	7/240 (2.9)	6/271 (2.2)	0/224 (0.0)	1/256 (0.4)	1/216 (0.5)
"No difficulty" performing activities due to symptom[f]					
No difficulty due to any symptom	131/240 (54.6)	160/271 (59.0)	149/224 (66.5)	170/256 (66.4)	170/216 (78.7)
Double images	217/240 (90.4)	250/271 (92.3)	210/224 (93.8)	247/256 (96.5)	205/216 (94.9)
Glare	172/240 (71.7)	220/271 (81.2)	186/224 (83.0)	214/256 (83.6)	190/216 (88.0)
Halos	177/240 (73.8)	205/271 (75.6)	175/224 (78.1)	198/256 (77.3)	186/216 (86.1)
Starbursts	163/240 (67.9)	186/271 (68.6)	177/224 (79.0)	206/256 (80.5)	182/216 (84.3)

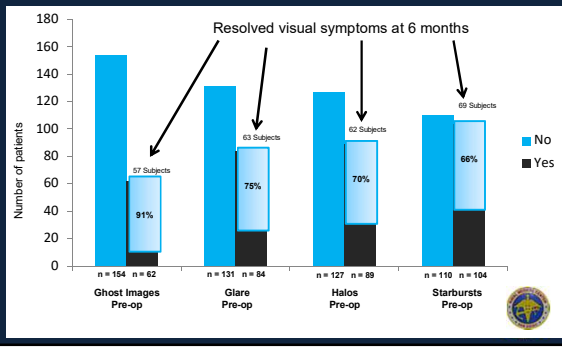
Prevalence of Preoperative Visual Symptoms



Prevalence of New Visual Symptoms at 6-months

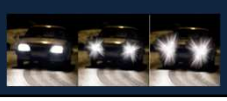


Resolution of Pre-op Visual Symptoms at 6 months

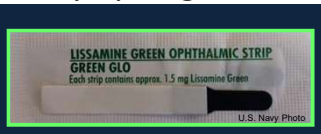


Summary of Visual Symptoms Findings

- For the cohort, the prevalence of visual symptoms decreased from pre op as compared to 6 months
- For each symptom index, up to 30% of patients reported new symptoms
- Up to 91 % of patients with pre op symptoms reported resolution of those symptoms post op
- Very few patients noted that visual symptoms negatively impacted their daily activities.



PROWL-1
Dry Eye Signs and Symptoms

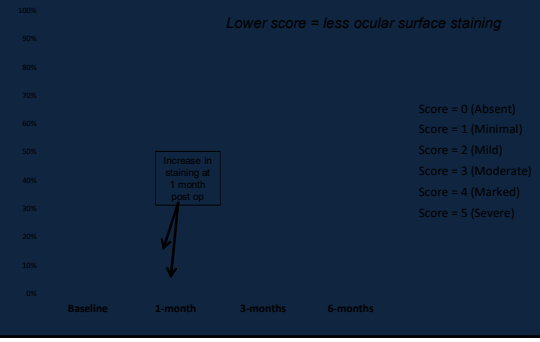


CLINICAL SCIENCES

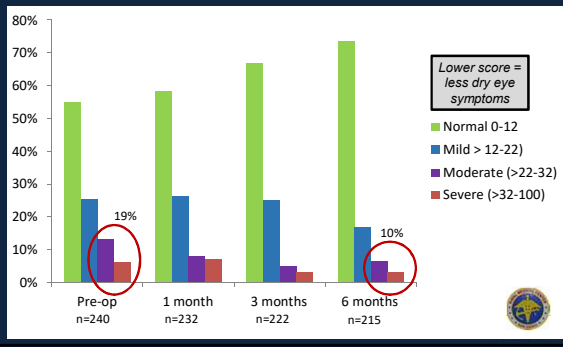
Reliability and Validity of the Ocular Surface Disease Index

Arch Ophthalmol. 2000; 118:615-621.

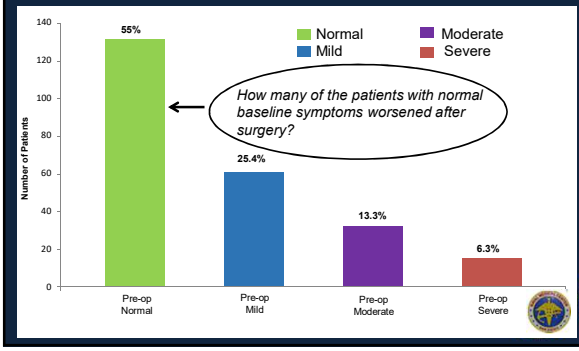
Oxford Scores:
Lissamine Green Slit Lamp Exam



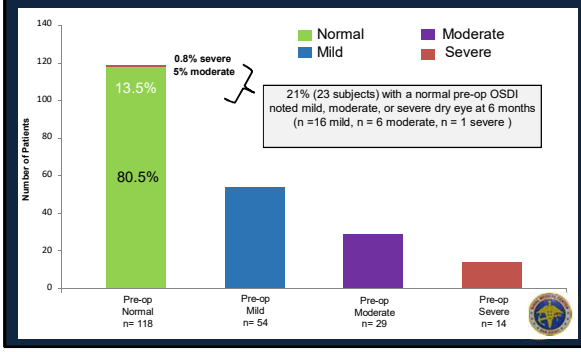
Ocular Surface Disease Index (OSDI)



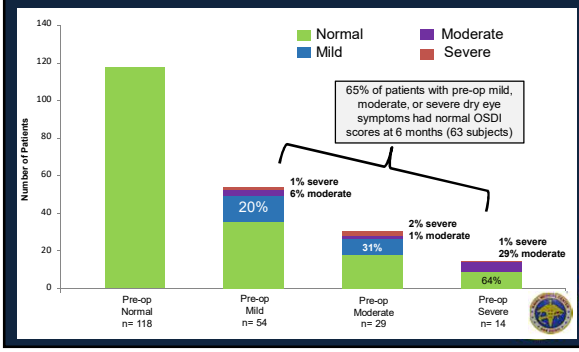
Preoperative Ocular Surface Disease Index (OSDI) Scores



Prevalence of Subjects with Normal Pre-op OSDI Scores Who Had Worsening OSDI Scores at 6 Months



Prevalence of Subjects with Mild/Moderate/Severe OSDI Scores Who Had Normal OSDI Scores at 6 Months

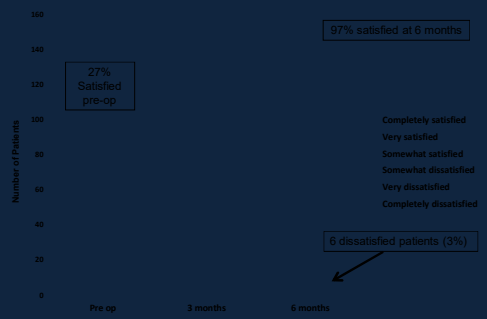


Summary of Dry Signs and Symptoms

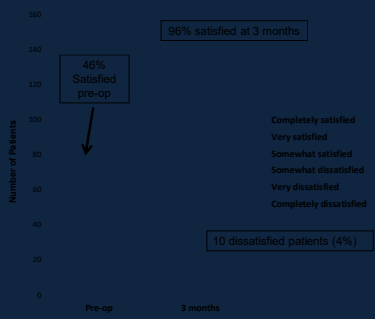
- For the cohort, Oxford scores worsened at one month, and the returned to preoperative scores
- For the cohort, OSDI scores improved from pre op as compared to 6 months
- Up to 21% of patients with normal pre op OSDI scores had mild/moderate/severe OSDI scores at 6 months
- 65% of patients with mild/moderate/severe OSDI scores pre op had normal scores at 6 months

Correlating Symptoms with Patient Satisfaction

PROWL 1: "How satisfied are you with your present vision?"



PROWL 2: "How satisfied are you with your present vision?"



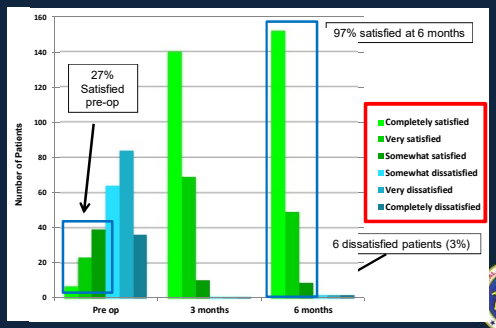
Causes of post-LASIK Dissatisfaction: Literature Review

- Dry eye symptoms
- Blurred distance vision
- Residual refractive error
- The need to wear glasses
- Visual disturbances

Factors Associated with post-LASIK Dissatisfaction with Vision : PROWL Study Findings

- ***Total number of dissatisfied subjects was too small to have enough statistical power to assess associated factors***
- 16 out of 496 subjects (PROWL 1 & 2): 3% overall
- Associations
  - Uncorrected vision 20/40 or worse
  - Residual myopia > 0.50 D
  - At least one visual symptom
  - Moderate to severe scores on the OSDI

PROWL 1:
"How satisfied are you with your present vision?"



Satisfaction Scale:
Higher value = Greater Satisfaction

100 Points

0 Points

- Completely satisfied
- Very satisfied
- Somewhat satisfied
- Somewhat dissatisfied
- Very dissatisfied
- Completely dissatisfied

3-Month Mean Satisfaction Scores*:
Uncorrected visual acuity

Satisfaction with Vision

	PROWL 1 Mean score (SD)	PROWL 2 Mean score (SD)
UCVA ≤ 20/40 (either eye)	60.0 (n/a) n = 1	57.1 (33.5) n= 7
UCVA > 20/40	91.3 (12.9) n = 216	88.2 (17.0) n = 243

*Satisfaction Scores: Higher number greater satisfaction
100 Completely satisfied, 0 Completely dissatisfied

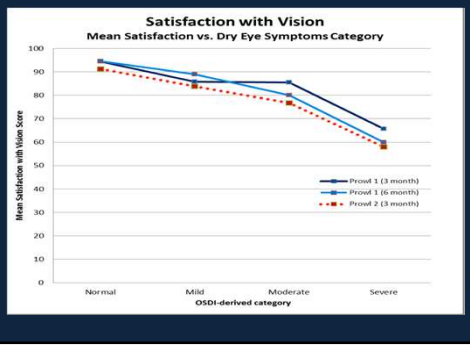
3-Month Mean Satisfaction Scores*:
Use of corrective lenses

Satisfaction with Vision

	PROWL 1 Mean score (SD)	PROWL 2 Mean score (SD)
Use corrective lenses	78.0 (22.0) n = 10	81.4 (14.6) n= 14
Do not use corrective lenses	91.5 (13.6) n = 212	87.5 (18.3) n = 240

*Satisfaction Scores: Higher number greater satisfaction
100 Completely satisfied, 0 Completely dissatisfied

Satisfaction vs. OSDI Scores



6- month PROWL-1 Free Text Question:
"What problems or limitations do you have because of your LASIK surgery?"

- 22 patients provided free text answers:
  - #1 answer: I now need reading glasses. (n 8)
  - #2 answer: My eyes feel dry more often. (n 6)
  - #3 answer: Driving at night is more difficult (n 5)
- These patients weren t necessarily dissatisfied with their surgery or their vision
- These patients didn t necessarily tell the clinicians that they were having any issues.

What Did We Learn from PROWL?
The Questionnaire

- The PROWL questionnaire is a validated instrument to assess symptoms and satisfaction before and after LASIK
- Adding images to define visual symptoms allow patients and surgeons to speak the same language
- Patients admit to more symptoms on an anonymous questionnaire than they mention to the surgeon in person

What Did We Learn from PROWL?
Exploring Symptoms

- Visual symptoms:
  - Patients note a high percentage of visual symptoms preoperatively
  - The majority of patients have fewer symptoms postop
  - A small percentage of patients develop new symptoms postop
- Dry eye symptoms:
  - More patients have mild moderate severe OSDI scores preop than post op
  - More patients have normal OSDI scores postop than preop
  - A small percentage of patients have worse OSDI scores postop

What Did We Learn from PROWL?
Exploring Patient Satisfaction

- Very few patients were dissatisfied with their post op vision
  - PROWL 1 at 6 months: 6 subjects out of 216 (3%)
  - PROWL 2 at 3 months: 10 subjects out of 256 (4%)
  - There were too few dissatisfied subjects for statistical conclusions
  - Associated factors:
    - Residual refractive error
    - UCVA ≤ 20/40
    - Worse OSDI scores
    - At least one visual symptom

Washington Post, page A20
Thursday, November 24, 2016
Thanksgiving Day

Study: After LASIK, many develop new symptoms

BY ARIANA EUNJUNG CHA

Seven years ago, as LASIK was becoming a household word, government scientists launched a major study to investigate reports of adverse effects from the vision-correction surgery. The results, published in October 2014, showed that some patients developed problems that hindered their daily lives, such as difficulty driving in sunshine or at night.

Yet the number of patients affected was so small — less than 1 percent — that drawing any strong conclusions was difficult.

On Wednesday, researchers from the Food and Drug Administration, the National Eye Institute and the Department of Defense released a follow-up report in JAMA Ophthalmology that provides more sobering information. The study suggests that the percentage of people who undergo LASIK and wind up with new symptoms, such as double images, glare, halos or starbursts, may be much higher.

The data was based on a questionnaire that looked at patient satisfaction with their vision and at visual and dry-eye symptoms following surgery.

First, the good news: More than 95 percent of participants said they were satisfied with the improvements to their vision. In addition, the prevalence of dry-eye symptoms also decreased after surgery.

The bad news is that a "substantial" percentage of individuals said they experienced other, new symptoms following the procedure.

The study analyzed outcomes for two groups of LASIK patients. In the first group, which included 262 Navy personnel with an average age of about 29, some 43 percent reported new symptoms. In the second group, consisting of 322 civilians with a median age of 31.5, seen at five vision practices and academic medical centers, 46 percent experienced new symptoms.

In addition, about 28 percent of patients who had never had dry-eye symptoms before their surgery developed mild, moderate or severe symptoms three months after the procedure.

"To our knowledge, our study is one of the few that have reported the development of new visual symptoms," Malvina Eydelman of the FDA and her research colleagues wrote. "While the overall prevalence of visual symptoms decreased, a large percentage of participants with no symptoms preoperatively reported new visual symptoms postoperatively."

One interesting component of the study was that the surveys showed the percentage of people with symptoms may be much higher than what previously was reported in studies involving direct interviews with health-care professionals. Eydelman and her co-authors note that patients' reluctance to tell their doctors about "negative" events has been well documented.

The researchers cautioned that the latest study may not generalize to the LASIK population as a whole because of its small sample size and short follow period, which was typically three months.

However, they emphasized that "although the magnitude of the development of symptoms is uncertain, patients undergoing LASIK surgery should be adequately counseled about the possibility of developing new visual symptoms after surgery prior to undergoing this elective procedure."

ariana.cha@washpost.com

More at washingtonpost.com/news/to-your-health

The Newspaper Headline Rewritten

Landmark collaborative study: After LASIK, most patients have fewer visual symptoms and high levels of satisfaction

Only a small percentage of patients did develop new symptoms after eye surgery

BY ELIZABETH HOFMEISTER

San Diego - Seven years ago, as LASIK was becoming a household word, government scientists launched a a major study to investigate reports of adverse effects from the vision-correction surgery. The results, published in October 2014, showed that some patients developed new

first phase of the study was conducted at Naval Medical Center San Diego, where active duty military patients undergoing LASIK had an opportunity to participate. Study participants reported a high incidence of visual symptoms before surgery, which in most subjects were

Keys to Patient Satisfaction after LASIK:
My personal recommendations

- Strive for super vision outcomes (better than 20/20)
  - Accurate cylinder axis treatment
  - Nomogram development
- Screen carefully for dry eyes
  - Treat Meibomian dysfunction
- Counsel carefully on surgical risks and set realistic expectations
  - Underpromise/over deliver
  - If expectations are met, satisfaction will be high
  - Even with your best efforts, there will be patients who are not satisfied


Questions?

02 March 2017

CURRICULUM VITAE

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DATE OF RANK: 01 September 2011

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PLACE OF BIRTH: Washington, DC

CERTIFICATION AND LICENSURE:

Diplomate National Board of Medical Examiners, March, 1994.
License to Practice Medicine and Surgery, Commonwealth of Virginia, July 1994 to present.
License to Practice Medicine and Surgery, Commonwealth of Pennsylvania, July 2001 to present.
Diplomate, American Board of Ophthalmology, June 2002; recertification December 2012.

EDUCATION:

Uniformed Services University of the Health Sciences (USUHS), August 1989- May 1993: Doctor of Medicine.
United States Naval Academy (USNA), July 1985- May 1989: Bachelor of Science in Chemistry.

POSTGRADUATE TRAINING:

National Naval Medical Center, July1993- June 1994: Internal Medicine Internship.
Naval Aerospace and Operational Medicine Institute, January 1995- June 1995: Flight Surgery School.
Naval Medical Center San Diego, July 1997 to July 2000: Ophthalmology Residency.
Wills Eye Hospital, Philadelphia, Pennsylvania, July 2001- July 2002: Cornea, External Disease, and Refractive Surgery Fellowship.

PRIOR MILITARY EXPERIENCE:

Assistant Protocol Officer: USNA, July 1989.
Midshipman: USNA, July 1985- May 1989.

PROFESSIONAL ASSIGNMENTS AND QUALIFICATIONS

Cornea and External Disease Staff Ophthalmologist, Naval Medical Center San Diego, August 2002 to present.
Refractive Surgery Advisor for Navy Ophthalmology, July 2010 to present.
Physician Trainer, Allegretto Wavelight excimer laser, 2010 to present.
Physician Proctor, Navy Intralase LASIK Physician Certification Training, 2006 to present.
Physician Trainer, VISX excimer laser, 2003 to present.
Instructor, USHUS Ocular Trauma Course: May 2003 to present.
Navy Liaison to San Diego Eye Bank Board of Directors, December 2011 to present.
Chairman, 2nd Annual Military Refractive Surgery Safety and Standards Symposium (MRSSS), June 2016.
Member, EyeWorld Editorial Board, February 2012 to 2016.
Staff Ophthalmologist, USNS Mercy Pacific Partnership 2015, May- August 2015.
Staff Ophthalmologist, USNS Mercy RIMPAC Exercise, June-July, 2014.
Chairman, 1st Annual Navy Refractive Surgery Safety and Standards Symposium, June 2014.
Chairman, 7th Annual International Military Refractive Surgery Symposium, San Antonio, Texas, January 2013.
Chairman, 6th Annual International Military Refractive Surgery Symposium, San Antonio, Texas, January 2012.
Head, Navy Refractive Surgery Center San Diego, May 2010 to October 2014.
Chairman, 4th Annual International Military Refractive Surgery Symposium, San Antonio, Texas. January 2010.
Deputy Command Surgeon, Combined Security Transition Command Afghanistan, Kabul, May 2009 – December 2009.
Member, American Academy of Ophthalmology Refractive Editorial Board, March 2009 to June 2014.
Chairman, 3nd Annual International Military Refractive Surgery Symposium, San Antonio, Texas. January 2009.
Program Director, San Diego Naval Medical Center Ophthalmology Residency: March 2008 to July 2010.
Instructor, USUHS Cataract Course, March 2008.
Chairman, 2nd Annual International Military Refractive Surgery Symposium, San Antonio, Texas. January 2008.
Course Director, Navy Refractive Surgery Course: June 2007 to present.
Chairman, Inaugural International Military Refractive Surgery Symposium, San Antonio, Texas. February 2007.
Ophthalmology Department Research Coordinator, Naval Medical Center San Diego: 2002 to 2008.
Assistant Ophthalmology Residency Director, Naval Medical Center San Diego: July 2004 to March 2008.
Ophthalmology Department Head, USNS Mercy: 2002 to 2005.
Member, Institutional Review Board, Naval Medical Center San Diego, 2002 to 2012.
Course director: Optics and Refraction Curriculum, Naval Medical Center San Diego, August 2002 to March 2009.
Course director: Optics and Refraction Curriculum, Naval Medical Center San Diego, August 2000- February 2001.

Comprehensive Ophthalmology Staff; Naval Medical Center San Diego and Ophthalmologist onboard USNS Mercy: July 2000 to June 2001.
Department Head, Military Medicine; Branch Medical Clinic, Marine Corps Base Hawaii: July 1995 to July 1997.
Research Assistant; Department of Ophthalmology, National Naval Medical Center: July 1994 to December 1994.

FACULTY APPOINTMENTS
Adjunct Associate Professor, Department of Ophthalmology, Loma Linda University: October 2007 to present.
Assistant Professor of Surgery, Uniformed Service University of the Sciences: March 2005 to present.

PROFESSIONAL ORGANIZATIONS:
Member, Alpha Omega Alpha Society
Member, American Society of Cataract and Refractive Surgeons
Member, American Academy of Ophthalmology
Member, Society of Military Ophthalmologists

PROFESSIONAL PRESENTATIONS:
Podium Presentation: "Wavefront-guided vs. Wavefront Optimized Femtosecond LASIK ." 3nd Annual Military Refractive Surgery Safety and Standards Symposium, San Diego, CA, January 2017.
Podium Presentation: "The State of Navy Refractive Surgery: 2017 Update." 3nd Annual Military Refractive Surgery Safety and Standards Symposium, San Diego, CA, January 2017.
Podium Presentation: "Correlating Patient Symptoms with Satisfaction after LASIK Surgery." 2nd Annual Military Refractive Surgery Safety and Standards Symposium, San Diego, CA, June 2016.
Podium Presentation: "The State of Navy Refractive Surgery: 2016 Update." 2nd Annual Military Refractive Surgery Safety and Standards Symposium, San Diego, CA, June 2016.
VISX Physician Trainer, 19th Annual Navy Refractive Surgery Conference, San Diego, CA, June 2016.
Podium Presentation: "Penetrating Anterior Segment Injuries." USUHS Tri-Service Ocular Trauma Surgery Lab, Bethesda, MD, May 2016.
Podium Presentation: "The Role of Big Data in Improving Refractive Surgery Outcomes." American Society of Cataract and Refractive Surgeons (ASCRS) Annual Meeting, New Orleans, LA, May 2016.
Podium Presentation: "Correlating Patient Symptoms with Satisfaction after LASIK Surgery." American Society of Cataract and Refractive Surgeons (ASCRS) Annual Meeting, New Orleans, LA, May 2016.
Film Festival Judge, American Society of Cataract and Refractive Surgeons (ASCRS) Annual Meeting, New Orleans, LA, May 2016.
Podium Presentation: "Cornea Transplantation: Providing a New Window to View the World." Ophthalmology Symposium for the Primary Care and Operational Providers, Naval Medical Center San Diego, January 2016.

Podium Presentation: "Penetrating Anterior Segment Injuries and Ocular Trauma Case Studies." Grand Rounds, Pacific Eye Institute, Suva, Fiji, June 2015.
Podium Presentation: "Patient Reported Outcomes with LASIK (PROWL-1) Clinical Results." Academic Research Competition, Naval Medical Center San Diego, April 2015.
Film Festival Judge, American Society of Cataract and Refractive Surgeons (ASCRS) Annual Meeting, San Diego, CA, April 2015.
Podium Presentation: "Military Refractive Surgery Update." American Society of Cataract and Refractive Surgeons (ASCRS) Annual Meeting, San Diego, CA, April 2015.
Podium Presentation: "Cornea Transplantation: Providing a New Window to View the World." Ophthalmology Symposium for the Primary Care and Operational Providers, Naval Medical Center San Diego, November 2014.
Podium Presentation: "Patient Reported Outcomes with LASIK (PROWL-1) Clinical Results." American Academy of Ophthalmology Annual Meeting, Chicago, IL, October 2014.
Podium Presentation: "U.S. Navy Warfighter Refractive Surgery Program: Enhancing Vision, Improving Operational Readiness." RIMPAC International Military Medicine Symposium, USS Peleliu, Pearl Harbor, HI, July 2014.
Podium Presentation: "Combat Ocular Trauma for the Non-Ophthalmologist." RIMPAC International Military Medicine Symposium, USS Peleliu, Pearl Harbor, HI, July 2014.
Podium Presentation: "Refractive Surgery Retreatments: Pearls and Pitfalls." 1st Annual Navy Refractive Surgery Safety and Standards Symposium, San Diego, CA, June 2014.
Podium Presentation: "The State of Navy Refractive Surgery: 2014 Update." 1st Annual Navy Refractive Surgery Safety and Standards Symposium, San Diego, CA, June 2014.
VISX Physician Trainer, 17th Annual Navy Refractive Surgery Conference, San Diego, CA, June 2014.
Podium Presentation: "Penetrating Anterior Segment Injuries." USUHS Tri-Service Ocular Trauma Course, Bethesda, MD, May 2014.
Podium Presentation: "Evolution of the Keratoprosthesis: How Artificial Corneas Bring New Hope in Corneal Blindness." USUHS Postgraduate Course in Ophthalmology, Bethesda, MD, May 2014.
Podium Presentation: "Teaching Residents Refractive Surgery." American Society of Cataract and Refractive Surgeons (ASCRS) Annual Meeting, Boston, MA, April 2014.
VISX Physician Trainer, 16th Annual Navy Refractive Surgery Conference, San Diego, CA, June 2013.
Podium Presentation: "Penetrating Anterior Segment Injuries." USUHS Tri-Service Ocular Trauma Course, Bethesda, MD, May 2013.
Podium Presentation: "Managing Acute Pain After Photorefractive Keratectomy: The Navy Perspective." American Society of Cataract and Refractive Surgeons (ASCRS) Annual Meeting, San Francisco, CA, April 2013.
Podium Presentation: "LASIK for High Hyperopia and High Astigmatism: U.S. Navy Visual Outcomes." American Society of Cataract and Refractive Surgeons (ASCRS) Annual Meeting, San Francisco, CA, April 2013.
Podium Presentation: "The Navy Phakic Intraocular Lens Study: Factors Affecting Vault Height." American Society of Cataract and Refractive Surgeons (ASCRS) Annual Meeting, San Francisco, CA, April, 2013.
Podium Presentation: "Phakic Intraocular Lens Misadventures." 7th Annual International Military Refractive Surgery Symposium, San Antonio, Texas, January 2013.

Podium Presentation: "Medical Indications for Corneal Refractive Surgery in the Military Health System." 7th Annual International Military Refractive Surgery Symposium, San Antonio, Texas, January 2013.

Podium Presentation: "LASIK for High Hyperopia and High Astigmatism: U.S. Navy Visual Outcomes." 7th Annual International Military Refractive Surgery Symposium, San Antonio, Texas, January 2013.

Podium Presentation: "The State of Navy Refractive Surgery: 2013 Update." 7th Annual International Military Refractive Surgery Symposium, San Antonio, Texas, January 2013.

Podium Presentation: "MEDTEAMS Training for Ophthalmology: Preventing Medical Errors by Working Together." NMCSD, November 2012.

Podium Presentation: "Military Refractive Surgery: 2012 Snapshot" Vision and Ocular Injury Symposium, Schepens Eye Research Institute, Boston, MA, September 2012.

VISX Physician Trainer, 15th Annual Navy Refractive Surgery Conference, San Diego, CA, June, 2012.

Podium Presentation: "Penetrating Anterior Segment Injuries." USUHS Tri-Service Ocular Trauma Course, Bethesda, MD, May 2012.

Podium Presentation: "Military Refractive Surgery Practice Patterns: 2012 Snapshot" American Society of Cataract and Refractive Surgeons (ASCRS) Annual Meeting, Chicago, Illinois, April 2012.

Podium Presentation: "Military Refractive Surgery Practice Patterns: 2012 Snapshot" American College of Ophthalmic Surgeons-Dulaney Winter Meeting. Aspen, Colorado. February 2012.

Podium Presentation: "Refractive Surgery Research Beyond 20/20." 6th Annual International Military Refractive Surgery Symposium, San Antonio, Texas, January 2012.

Podium Presentation: "The State of Navy Refractive Surgery: 2012 Update." 6th Annual International Military Refractive Surgery Symposium, San Antonio, Texas, January 2012.

Podium Presentation: "MEDTEAMS Training for Ophthalmology: Preventing Medical Errors by Working Together." NMCSD, November 2011.

Podium Presentation: "Refractive Surgery and Its Impact on the Warfighter." American Academy of Ophthalmology Annual Meeting, Orlando, October 2011.

Podium Presentation: "Screening Standards for Military Refractive Surgery." American Academy of Ophthalmology Annual Meeting, Orlando, October 2011.

Podium Presentation: Building Security in Afghanistan: The Role of the Military Medical System. American Academy of Ophthalmology Annual Meeting, Orlando, October 2011.

Visiting Professor Lecture: "Management of LASIK Flap Dislocations." Madigan Army Medical Center, August 26, 2011.

Podium Presentation: "Effective PowerPoint Presentations" NMCSD Research Methods Course, July 29, 2011.

VISX Physician Trainer, 14th Annual Navy Refractive Surgery Conference, San Diego, CA, June, 2011.

Podium Presentation: "Penetrating Anterior Segment Injuries." USUHS Tri-Service Ocular Trauma Course, Bethesda, MD, May 2011.

Podium Presentation: "FDA and Ophthalmology: LASIK Quality of Life Study Update." American Society of Cataract and Refractive Surgeons (ASCRS) Annual Meeting, San Diego, California, March 2011.

Podium Presentation: "Dose-Response for Mitomycin-C in Prevention of Haze in Photorefractive Keratectomy for High Myopia." American Society of Cataract and Refractive Surgeons (ASCRS) Annual Meeting, San Diego, California, March 2011. Winner of "Best of Paper of Session".

Podium Presentation: "Dose-Response for Mitomycin-C in Prevention of Haze in Photorefractive Keratectomy for High Myopia." 26th Annual NMCSD Academic Research Competition, March 2011.

Podium Presentation: "Public Perception of LASIK", Aspen Invitational Refractive Symposium, Aspen, Colorado, March 2011.

Podium Presentation: "Dose-Response for Mitomycin-C in Prevention of Haze in Photorefractive Keratectomy for High Myopia." 5th Annual International Military Refractive Surgery Symposium, San Antonio, Texas, January 2011.

Podium Presentation: "Screening Standards for Military Refractive Surgery Patients." 5th Annual International Military Refractive Surgery Symposium, San Antonio, Texas, January 2011.

Podium Presentation: "Hot Off the Presses: Patient-Reported Outcomes with LASIK." 5th Annual International Military Refractive Surgery Symposium, San Antonio, Texas, January 2011.

Podium Presentation: "The State of Navy Refractive Surgery: 2011 Update." 5th Annual International Military Refractive Surgery Symposium, San Antonio, Texas, January 2011.

Podium Presentation: "Rebuilding Security in Afghanistan: The Role of the Military Medical System." Wills Eye Hospital Cornea Conference, Philadelphia, December 2010.

Podium Presentation: "Dose-Response for Mitomycin-C in Prevention of Haze in Photorefractive Keratectomy for High Myopia." Wills Eye Hospital Cornea Conference, Philadelphia, December 2010.

Podium Presentation: "Symposium: Update on Military Refractive Surgery", American Academy of Ophthalmology Annual Meeting, Chicago, October 2010.

Podium Presentation: "Eye on LASIK: Dialogue with the FDA. Patient Reported Outcomes with LASIK", American Academy of Ophthalmology Annual Meeting, Chicago, October 2010.

VISX Physician Trainer, 13th Annual Navy Refractive Surgery Conference, San Diego, CA, June, 2010.

Podium Presentation: "Gabapentin vs. Oxycodone/Acetaminophen in Prevention of Postoperative Pain Following Photorefractive Keratectomy for Myopia." 25th Annual NMCSD Academic Research Competition, April 2010.

Podium Presentation: "Navy Experience with Aniridic Intraocular Lenses for the Rehabilitation of Vision in Traumatic Aniridia." Military Ocular Trauma Symposium, American Society of Cataract and Refractive Surgeons (ASCRS) Annual Meeting, Boston, April 2010.

Podium Presentation: "Gabapentin vs. Oxycodone/Acetaminophen in Prevention of Postoperative Pain Following Photorefractive Keratectomy for Myopia." American Society of Cataract and Refractive Surgeons (ASCRS) Annual Meeting, Boston, April 2010.

Poster Presentation: "Dose-Response for Mitomycin-C in Prevention of Haze in Photorefractive Keratectomy for High Myopia." American Society of Cataract and Refractive Surgeons (ASCRS) Annual Meeting, Boston, April 2010.

Podium Presentation: "An Update on Afghan National Security Forces Medical Development." Medical Strategic Leadership Course, San Antonio, Texas, April 2010.

Podium Presentation: "Gabapentin vs. Oxycodone/Acetaminophen in Prevention of Postoperative Pain Following Photorefractive Keratectomy for Myopia." 4th Annual International Military Refractive Surgery Symposium, San Antonio, Texas, January 2010.

Podium Presentation: "Point/Counterpoint: The Case Against Mitomycin-C for Prevention of Haze Following PRK." 4th Annual International Military Refractive Surgery Symposium, San Antonio, Texas, January 2010.

Panelist, Symposium on Refractive Surgery in Dynamic Individuals: Military and Civilian Perspective. American Society of Cataract and Refractive Surgeons (ASCRS) Annual Meeting, San Francisco, April 2009.

Podium Presentation: "Effective PowerPoint Presentations" NMCSD Research Methods Course, March 13, 2009.

Podium Presentation: "Wavefront-Guided Corneal Refractive Surgery Following Phakic Intraocular Lens Implantation for High Myopia with Astigmatism." 3nd Annual International Military Refractive Surgery Symposium, San Antonio, Texas, January 2009.

Podium Presentation: "Medical Contraindications to Corneal Refractive Surgery: Hazards vs. Hype." 3nd Annual International Military Refractive Surgery Symposium, San Antonio, Texas, January 2009.

Podium Presentation: "Wavefront-Guided Corneal Refractive Surgery Following Phakic Intraocular Lens Implantation for High Myopia with Astigmatism." Wills Eye Institute Biennial Cornea Conference, Philadelphia, PA, December 2008.

Podium Presentation: "Update on the International Military Refractive Surgery Symposium." TATRC, Fort Dietrich, Maryland, October 2008.

Podium Presentation: "Effective PowerPoint Presentations" NMCSD Research Methods Course, September 5, 2008.

VISX Physician Trainer, 11th Annual Navy Refractive Surgery Conference, San Diego, CA, June, 2008.

Podium Presentation: "Phakic Intraocular Lens Implantation of the Staar ICL for High Myopia at Navy Refractive Surgery Center San Diego: Results from our First Year." Ophthalmology Department Research Day, May 2008.

Podium Presentation: "Phakic Intraocular Lens Implantation of the Staar ICL for High Myopia at Navy Refractive Surgery Center San Diego: Results from our First Year." 23rd Annual NMCSD Academic Research Competition, April 2008.

Podium Presentation: "Wavefront-Guided Corneal Refractive Surgery Following Phakic Intraocular Lens Implantation for High Myopia with Astigmatism." American Society of Cataract and Refractive Surgeons (ASCRS) Annual Meeting, Chicago, Illinois, April 2008. Winner of "Best of Paper of Session".

Podium Presentation: "Cataract Surgery in the Setting of Corneal Disease" USUHS Cataract Course, Bethesda, Maryland, March 2008.

Podium Presentation: "Intraocular Lenses" USUHS Cataract Course, Bethesda, Maryland, March 2008.

Podium Presentation: "Lines in the Sand: Screening Standards for Military Refractive Surgery Candidates." 2nd Annual International Military Refractive Surgery Symposium, San Antonio, Texas, January 2008.

Podium Presentation: "Refractive Surgery Policies of the U.S. Military and Militaries around the World," Canadian Refractive Surgery Symposium, Toronto, Ontario, September 2007.

VISX Physician Trainer, 10th Annual Navy Refractive Surgery Conference, San Diego, CA, June, 2007.

Podium presentation: "Intralase Vertical Gas Breakthrough" Third Annual Ophthalmology Department Research Day, May 2007.

Podium presentation: "Refractive Surgery Policies of Militaries around the World." International Military Refractive Surgery Symposium, San Antonio, Texas, February 2007.

Podium presentation: "Intralase Vertical Gas Breakthrough" International Military Refractive Surgery Symposium, San Antonio, Texas, February 2007.

Podium presentation: "Rehabilitation of a Combat Injured Marine with the Type 1 Boston Keratoprosthesis" Wills Eye Hospital Cornea Conference, December 2006.

VISX Physician Trainer, 9th Annual Navy Refractive Surgery Conference, San Diego, CA, June, 2006.

Podium presentation: "The Bionic Eye: Rehabilitation of a Combat Injured Marine with the Type 1 Boston Keratoprosthesis." First runner up, Naval Medical Center San Diego Research Competition, April 2006.

Podium presentation: "Prevention of Post LASIK Ectasia" Navy Refractive Surgery Symposium, San Diego, California, January 2006.

VISX Physician Trainer, 8th Annual Navy Refractive Surgery Conference, San Diego, CA, June, 2005.

VISX Physician Trainer, 7th Annual Navy Refractive Surgery Conference, San Diego, CA, June, 2004.

VISX Physician Trainer, 6th Annual Navy Refractive Surgery Conference, San Diego, CA, June, 2003.

Podium presentation: "The Role of Sutures in the Management of LASIK Flap Complications." American Society of Cataract and Refractive Surgeons (ASCRS) Annual Meeting, Philadelphia, Pennsylvania, May 2002.

Podium presentation: "Follow-up Patterns After Penetrating Keratoplasty." Wills Eye Hospital Annual Conference, Philadelphia, Pennsylvania, March 2002.

Poster presentation: "Comparison of Tropicamide with Cyclopentolate for Cycloplegic Refractions in Adult Refractive Surgery Patients." American Academy of Ophthalmology Annual Meeting, Dallas, Texas, October 2000. (staff)

Podium presentation: "Comparison of Tropicamide with Cyclopentolate for Cycloplegic Refractions in Adult Refractive Surgery Patients." First runner up, Naval Medical Center San Diego Research Competition, April 2000 (resident).

Poster presentation: "The Effect of IOL Power on Myopic Shift in Pediatric Pseudophakia." Association for Research in Vision and Ophthalmology (ARVO) Meeting, Ft. Lauderdale, Florida, May 1999. (resident)

Podium presentation: "The Effect of IOL Power on Myopic Shift in Pediatric Pseudophakia." Naval Medical Center San Diego Research Competition, April 1999. (resident)

Podium presentation: "Relapsing Paralytic Ileus with Herpes Zoster." Society of Air Force Physicians Meeting, St. Louis, Missouri, March 1993. (medical student)

PUBLICATIONS:

Eydelman M, Hilmantel G, Tarver ME, Hofmeister EM, May J, Hammel K, MS; Hays RD, Ferris F. Symptoms and Satisfaction of Patients in the Patient-Reported Outcomes With Laser In Situ Keratomileusis (PROWL) Studies. JAMA Ophthalmol 2017; 135(1): 13-22.

Hays RD, Tarver ME, MD, Spritzer KL, Reise S, Hilmantel G, Hofmeister EM, Hammel K, May J, Ferris F, Eydelman M. Assessment of the Psychometric Properties of a Questionnaire Assessing Patient-Reported Outcomes With Laser In Situ Keratomileusis (PROWL). JAMA Ophthalmol 2017; 135(1): 3-12.

Richmond CJ, Barker PD, Levine EM, Elizabeth M. Hofmeister EM. Laser In Situ Keratomileusis Flap Stability in an Aviator Following Aircraft Ejection. J Cataract Refractive Surgery. September 15, 2016. 42:1681-1683

McClatchey SK, Hofmeister EM. "Calculation and Selection of Intraocular Lens Power for Children" in Pediatric Cataract Surgery: Techniques, Complications and Management. 2nd edition. Wilson ME, Trivedi RH, editors. Lippincott Williams & Wilkins. 2014.

McClatchey SK. "Measuring and Managing Residual Refractive Error after Intraocular Lens Implantation" in Pediatric Cataract Surgery: Techniques, Complications and Management. 2nd edition. Wilson ME, Trivedi RH, editors. Lippincott Williams & Wilkins. 2014.

Hofmeister EM, Bishop FM, Kaupp SE, Schallhorn SC. Randomized dose-response analysis of mitomycin-C to prevent haze after photorefractive keratectomy for high myopia. J Cataract Refract Surg 2013; 39:1358-1365.

Tanzer DJ, Brunstetter T, Zeber R, Hofmeister E, Kaupp S, Kelly N, Mirzaoff M, Sray W, Brown M, Schallhorn S. Laser in situ keratomileusis in United States Naval Aviators. J Cataract Refract Surg 2013; 39:1047-1058.

Schmitz JW, McEwan GC, Hofmeister EM. Delayed presentation of traumatic dislocation of a Visian implantable collamer lens. J Refract Surg. 2012 May; 28(5):365-7.

Hofmeister EM, Bishop FM. Complications of Refractive Surgery. Duane's Ophthalmology Book chapter. Tasman and Jaeger, editors. 6800-6833, 2012.

Hofmeister EM. PRK Postoperative Complications. Wills Eye Hospital 5-Minute Ophthalmology Consult. Book chapter, Maguire, Murchison, Jaeger editors. 30-31, 2012.

Hofmeister EM. LASIK Postoperative Complications. Wills Eye Hospital 5-Minute Ophthalmology Consult. Book chapter, Maguire, Murchison, Jaeger editors. 22, 2012.

McEwan G, Hofmeister EM, Kubis KC, Blade KA. Monocular Embolic Retinal Arteriolar Occlusions After Ipsilateral Intraoral Triamcinolone Injection Journal of Neuro-Ophthalmology 30: 98-99, 2010.

McClatchey SK, Hofmeister EM. The Optics of Aphakic and Pseudophakic Eyes in Childhood. Surv Ophthalmol 55: 174-182, 2010.

Kim PY, Mangham D, Hall FX, Hofmeister EM. "Report: Investigation of and Response to Novel H1N1 Influenza among Soldiers of the Afghan National Army, Kabul, Afghanistan, 30 October - 14 November 2009." Armed Forces Medical Surveillance Monthly Report. 16(11): 8-10, 2009.

Hofmeister EM, Kaupp SE, Schallhorn SC. "Comparison of Tropicamide and Cyclopentolate for Cycloplegic Refractions in Myopic Adult Refractive Surgery Patients" J Cataract Refract Surg 31: 694-700, 2005.

McClatchey SK, Hofmeister EM. "Intraocular Lens Power Calculation for Children" Pediatric Cataract Surgery (book chapter M. Edward Wilson et al, editor): 30-38; 2005.

Speer CE, Hofmeister E, Cohen EJ. "An Atypical Presentation of Acanthamoeba Keratitis in a Noncontact Lens Wearer" Eye & Contact Lens 29(1): 21-22, 2003.

McKinley J, Hofmeister E. "EMLA Induced Eye Injury- A Case Report" Archives of Dermatology, 135(7): 855-6, July 1999.

ACTIVE RESEARCH:

Principal Investigator: "Military iDesign PRK Study (MiPS)": ongoing

Principal Investigator: Wavefront-Guided vs Wavefront Optimized Femtosecond LASIK. Status: data collection complete; preparing for presentation and publication

Associate Investigator: Mitomycin C/PRK Study. Status: ongoing.

AWARDS AND HONORS:

Society of Military Ophthalmologists' Ancient Order of St. Lucia Award, November 2015.
Master Clinician Award, Naval Medical Center San Diego, August, 2012.
Military Health System "Building Stronger Female Physicians Leadership Award", Washington, DC, January 2010, Navy recipient in the inaugural year of this award.
Defense Meritorious Service Medal, October 2009.
Meritorious Service Medal, May 2009
Meyer Wiener Resident Teaching Award for academic year 2002-2003.
Navy and Marine Corps Commendation Medal, August, 1997, August, 2001, and August, 2015.
Joint Services Achievement Medal, May 1993.
Navy Achievement Medal, April 1996.
American Medical Women's Association: Glasgow Memorial Achievement Citation, May 1993.
Graduated "With Distinction" from US Naval Academy, May 1989.
Brigade Operations Officer during senior year at US Naval Academy, 1989.

FINANCIAL DISCLOSURES:

None.