

General Information

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Place of Birth: Boston, Massachusetts, USA

Education

Year	Degree	Institution
1979	BS, Electrical Engineering, <i>cum laude</i>	Rice University
1984	PhD, Cell Biology	Baylor College of Medicine
1987	MD	Baylor College of Medicine

Postdoctoral Training:

Year	Title	Specialty/Discipline	Place of Training
1987-1988	Internship	Transitional	Framingham Union Hospital
1988-1991	Resident	Ophthalmology	Massachusetts Eye and Ear Infirmary, Harvard Medical School
1991-1992	Clinical Fellow	Pediatric Ophthalmology and Strabismus	The Wilmer Ophthalmological Institute, Johns Hopkins University

Fellowship Directors: David L Guyton, MD and Michael X Repka, MD.

Licensure and Certification:

Year	Type of license
1991	Maryland medical license #D41340
1992	American Board of Ophthalmology (recertified 2002)
2002	Massachusetts medical license #213119

Academic Appointments:

Year	Academic Title	Institution
1992	Assistant Professor of Ophthalmology	Johns Hopkins University School of Medicine
1994	Assistant Professor of Biomedical Engineering	Johns Hopkins University School of Medicine
2000	Associate Professor of Ophthalmology	Johns Hopkins University School of Medicine
2002	Associate Professor of Ophthalmology	Harvard Medical School

Hospital or Affiliated Institution Appointments:

Year	Title	Institution
July 1, 1991- Jan 31, 2002	Full time	Johns Hopkins Medical Institutions
Feb 1, 2002- present	Ophthalmologist-in-Chief	Children's Hospital Boston

Hospital and Health Care Organization Service Responsibilities:

Year	Title	Institution
July 1, 1991- Jan 31, 2002	Full time	Pediatric Ophthalmology and Adult Strabismus Service, The Wilmer Ophthalmological Institute, Johns Hopkins
Feb 1, 2002- present	Active staff	Children's Hospital Boston

Major Administrative Responsibilities:

Year	Title	Institution
2002-present	Ophthalmologist-in-Chief	Children's Hospital Boston
2003-present	President	Children's Hospital Ophthalmology Foundation, Inc.
2006-present	Editor-in-Chief	Journal of the American Association of Pediatric Ophthalmology and Strabismus
2006-present	Trustee	Association for Research in Vision and Ophthalmology

Major Committee Assignments (medical school):

Year	Name of Committee	Role	Institution
1982-1984	Admissions Committee, Department of Cell Biology	Member	Baylor College of Medicine
1989-1990	Residency steering committee, Dept. of Ophthalmology	Member	Massachusetts Eye and Ear Infirmary
1993-present	Fellowship committee	Chair	Wilmer Ophthalmological Institute

1994-1997	Electronic patient record committee	Consultant	Wilmer Ophthalmological Institute
1998	Telemedicine committee	Member	Johns Hopkins Hospital
1999-2002	Technology licensing committee	Member	Johns Hopkins University
2002-2005	Physician's Organization Satellite Group	Member	Children's Hospital Boston
2002-present	Council of Chiefs	Member	Children's Hospital Boston
2002-present	Surgical Executive Committee	Member	Children's Hospital Boston
2002-present	Medical Staff Executive Committee	Member	Children's Hospital Boston
2002-present	Physician Leadership Council	Member	Children's Hospital Boston
2004-present	Physicians Advisory Committee, Children's Hospital Applications Maximizing Patient Saftery (CHAMPS)	Member	Children's Hospital Boston
2007	Physician's Organization nominating committee	Member	Children's Hospital Boston

Major Committee Assignments (national):

Year	Name of Committee	Role	Institution
2003-2004	National Eye Institute Special Emphasis Panel: Novel therapeutic and pathogenic studies of oculomotor disorders. Drew W. Noden, PhD, Chair	Member	National Institutes of Health
2003-2004	Technology Assessment Committee	Member	American Academy of Ophthalmology
2004-2007	Program Committee, Eye Movements, Strabismus, and Amblyopia (EY section)	Member (chair, 2007)	Association for Research in Vision and Ophthalmology (ARVO)

Professional Societies

Year	Society	Role
1979-present	Institute of Electrical and Electronics Engineers (IEEE)	Senior Member
1982-present	Association for Research in Vision and Ophthalmology (ARVO)	Member and Trustee
1992-present	American Academy of Ophthalmology (AAO)	Fellow
1992-present	American Association of Pediatric Ophthalmology and Strabismus (AAPOS).	Member
2006-present	Council of Science Editors	Member

Editorial Boards:

Year	Role	Name of Journal
1991-present	Ad-hoc reviewer	<i>Archives of Ophthalmology</i>
1992-present	Ad-hoc reviewer	<i>Ophthalmology</i>
1993-present	Ad-hoc reviewer	<i>Journal of the American Association for Pediatric Ophthalmology and Strabismus</i>
1993-present	Ad-hoc reviewer	<i>American Journal of Ophthalmology</i>
1999-2006	Editorial Board Member	<i>Journal of the American Association for Pediatric Ophthalmology and Strabismus</i>
2000	Ad-hoc reviewer	<i>Vision Research</i>
2001-2006	Guest Editorial Board Member	<i>Investigative Ophthalmology</i>
2002-2007	Editorial Board Member	<i>Binocular Vision and Strabismus Quarterly</i>
2003-present	Editorial Board Member	<i>Digital Journal of Ophthalmology</i>
2006-present	Editor in Chief	<i>Journal of the American Association for Pediatric Ophthalmology and Strabismus</i>

Awards and Honors:

Year	Name of Award
1978, 1979	George R. Brown engineering scholarship
1979	Tau Beta Pi (Engineering honor society)
1980-1982	Andress/McGlothlin fellowship, Dept. of Cell Biology
1982-1984	Baylor MD/PhD (Medical Scientist Training Program) fellowship
1986	Baylor MD/PhD, Most Outstanding Clinical Performance Award
1986	<i>Alpha Omega Alpha</i>
1991-92	National Children's Eye Care Foundation Fellowship Loan
1991-92	Heed Ophthalmic Foundation Fellowship Award
1994-1999	Faculty teaching award, The Osler Institute
1994-6	Richard Starr Ross Clinician Scientist Award, Johns Hopkins University
1995	Niuta and Roy Titus Faculty Development Award
1996	L. Harrell Pierce Wilmer Resident Teaching Award
1999	Research to Prevent Blindness Lew R. Wasserman Merit Award
2002	Honor award, American Association for Pediatric Ophthalmology and Strabismus
2004	Achievement Award, American Academy of Ophthalmology
2005	Robert A. Petersen Resident Teaching Award, Children's Hospital Boston
2005	Research to Prevent Blindness Walt and Lilly Disney Award for Amblyopia Research
2006	Research to Prevent Blindness Walt and Lilly Disney Award for Amblyopia Research – second award
2007	Senior member status, IEEE
2007	Outstanding State Advocate Award, American Academy of Ophthalmology

Part II. Research, teaching, and clinical contributions:**1. Narrative Report:****Overview:**

I am a pediatric ophthalmologist, the ophthalmologist-in-chief at Children's Hospital Boston, and Editor-in-Chief of the Journal of the American Association for Pediatric Ophthalmology and Strabismus (AAPOS). In my clinical/surgical practice, I care for children and adults with highly complex strabismus, many of whom are referred from other pediatric ophthalmologists. My clinical and translational research in strabismus and amblyopia build upon and extend my clinical expertise. I teach optics and refraction to ophthalmology residents at Harvard and worldwide.

Clinical:

My main clinical expertise is complex strabismus and the use of adjustable sutures; I have a referral-only practice and routinely host local, national, and international observers in my clinic. My teaching focuses on clinical optics and extends across all aspects of pediatric ophthalmology; I organize and provide two separate all-day teaching sessions in optics and refraction annually for Harvard residents, with introductory lectures in July and review lectures in April. I co-authored "Last Minute Optics," a widely used optics review book, and I lecture on optics at teaching programs and review courses nationally.

Research:

Amblyopia is a major public health problem, affecting 2-4% of all children. If detected early, amblyopia can be effectively treated. Unfortunately, primary care providers are unable to identify children at risk for amblyopia consistently, and half of affected children remain undiagnosed at age 5. There is a need for a sensitive and specific screening protocol to identify children with amblyopia. In collaboration with David Guyton, MD at Johns Hopkins, we developed the Pediatric Vision Screener (PVS), a device that uses scanning polarization optics and Fourier analysis to automatically detect strabismus in children with extremely high accuracy. The PVS detects alignment of the eyes with such exquisite sensitivity that we have discovered that it can be used to effectively diagnose amblyopia by detecting microstrabismus in patients with amblyopia. The angle of strabismus in these patients is too small to detect with standard clinical testing, but the PVS routinely detects the problem. We are now further exploring nuances in the pathogenesis of amblyopia, in particular anisometropic amblyopia, using the device. When these studies are complete we will proceed to commercialize the PVS device. My work on this device since I arrived at Harvard has led to two additional invention disclosures (one related to optics but unrelated to the PVS), with patents pending.

I am exploring the genetics of strabismus in collaboration with Elizabeth Engle, MD in the Department of Neurology at Children's Hospital. Dr. Engle's laboratory has identified genetic mutations that cause the rare and complex ocular motility disorder, congenital fibrosis of the extraocular muscles (CFEOM), one of the congenital cranial dysinnervation disorders (CCDDs). The expertise and collaboration that we developed working on these Mendelian disorders has led us to attack the more difficult problem of the genetics of common strabismus (including simple esotropia, exotropia, and anisometropic amblyopia). I have used my administrative and organizational abilities to create clinical systems in the Department of

Ophthalmology that will support not only this genetic study but all future genetic studies in the Department. Our study informs all subjects with strabismus of the study and enrolls all who agree to participate (along with affected and unaffected family members) during routine office visits; we carefully utilize resources and communication to accomplish this while preserving the normal high throughput of patients in the clinic. While many genetic studies rely upon family history to characterize the phenotype of relatives, our protocol requires clinical examination of all relatives to assure that the phenotype is correctly characterized. Our preliminary results indicate that many supposedly-normal family members actually demonstrate subtle forms of strabismus or amblyopia; this will be invaluable information once genotyping commences. We have enrolled 350 probands to date and collected 1200 samples from families; however, we plan to enroll many more families before the actual search for the responsible genes will begin. The lessons learned as we conduct the difficult work of enrolling potentially thousands of subjects for genetic studies will allow us to gradually improve our efficiency, and we expect that our technique will then serve as a model for future studies in the Department of Ophthalmology. The Department of Neurology and other departments at Children's Hospital are discussing with us their wish to pursue similar studies of other hereditary, non-Mendelian conditions.

I am also collaborating with Lee Goldstein, MD, PhD and Roberto Pineda, MD to characterize the nature of lens opacities in patients with Down syndrome. Dr. Goldstein's group discovered that Alzheimer's protein accumulates in the lens of patients with Alzheimer's disease. These protein accumulations cause refractive changes in the lens that can be detected by scanning the eye using quasielastic light scattering (QELS). Down Syndrome patients, who have a propensity to develop cataract early in life, also develop a severe form of Alzheimer's disease if they survive into adulthood. My initial role in this project was to identify patients with Down syndrome and obtain de-identified surgical cataract samples for analysis under an IRB exemption. In the course of discussing this project with Children's faculty, we discovered that Richard Robb, MD, emeritus ophthalmologist-in-chief at Children's Hospital, had saved whole eye specimens from a pathologic study of Down syndrome that he had performed some 25 years earlier. We re-embedded these samples and performed immunohistochemistry and Congo red studies to identify Alzheimer's protein in the lenses of these subjects. I am now working with Drs. Pineda and Goldstein to review data obtained from analysis of ex-vivo and post-mortem Down syndrome lenses, including ELISA, QELS, and immunogold electron microscopy to confirm that Alzheimer's beta amyloid is present through independent avenues if investigation. We are also preparing a protocol to perform QELS in all Down Syndrome patients at Children's hospital to identify accumulation of Alzheimer's protein in the lens in vivo.

Teaching:

I developed a new "Introduction to Optics and Refraction" course for incoming Harvard ophthalmology residents, and created an "Optics and Refraction Board Review" course for all ophthalmology residents and fellows in the Boston area. I devote 12 hours of direct teaching time to these two efforts, not including preparation time. I initiated "Ophthalmology Chief's Rounds at Children's Hospital," a monthly clinical teaching session for fellows, residents, and students. I was nominated for the Harvard Medical student teaching award in 2004, and I received the Robert Petersen Pediatric Ophthalmology teaching award in 2005. Two of my mentees from my optics laboratory at Johns Hopkins (Ankoor Shah, MD, PhD, and Ken Mandell, MD, PhD) are currently ophthalmology residents in the Harvard program.

I created the first International Fellowship in Pediatric Ophthalmology at Children's Hospital, co-sponsored by Restoring Sight International and the Children's Hospital Ophthalmology Foundation, Inc. Through a stipulation of RSI, these fellows are required to perform part-time community service for a period of five years after their return to their native country. I also established an International Observership in Ophthalmology through a shepherded donation of \$100,000 to the Children's Hospital Ophthalmology Foundation. Income from this donation supports the living expenses of international observers during their stay in Boston.

As Ophthalmologist-in-Chief, I have acted to promote teaching and professional interactions within the Department and the community. My department sponsors the Harvard Introduction to Pediatric Ophthalmology elective for local and international medical students, one of only two clinical ophthalmology electives offered by Harvard. I created the Robert A. Petersen Award for Resident Teaching in Pediatric Ophthalmology to recognize the past accomplishments of Dr. Petersen in perpetuity as well as the future teaching efforts of recipients. I established the "Greater Boston Pediatric Ophthalmology and Strabismus Journal Club" to promote collegiality among pediatric ophthalmologists in the community and at other teaching institutions. I led the development, initiation, and funding of the Children's Hospital Boston Visiting Professorship lecture series, which has brought 6 internationally-recognized visiting professors to Boston annually since 2006.

Administrative:

During my tenure as Chief of Ophthalmology at Children's Hospital, I have improved research and clinical systems to create an environment that fosters clinical excellence, research innovation, and academic advancement of faculty. As Editor-in-Chief of the Journal of AAPOS, I have applied editorial guidance, administrative oversight, and structural changes that have improved the quality of science in the journal, provided more specific guidance and leadership for research directions, and led to more rapid dissemination of new information to pediatric ophthalmologists worldwide. As Annual Program Committee Chair for the Eye Movements, Strabismus, Amblyopia, and Neuro-ophthalmology section of ARVO, I have set the stage for future research in strabismus and amblyopia by developing and organizing key symposia at recent annual meetings, and as a Trustee of ARVO I have taken an active role in support of increased funding of eye research.

I have also developed and mentored faculty research within the department. In the past 5 years, all MD and independent PhD faculty members have advanced academically. I have taken an active role mentoring the advancement to full professor of Lois Smith, MD, PhD, Anne Fulton, PhD, Elizabeth Engle, MD, and Robert D'Amato, MD, PhD (all appointments are in process but have passed beyond the Ophthalmology Executive Committee). I facilitated a number of awards, including both the Bressler and Friedenwald Awards for Dr. Smith. I have also added to the wealth of academic strength and collaboration within our department, recruiting a highly competitive computational neurobiologist Gabriel Kreiman, PhD (in collaboration with the Neurobiology Program and Department of Neurology) as well as Alexandra Elliott, MD, a dual-fellowship-trained pediatric oculoplastic surgeon (in collaboration with the departments of otolaryngology and plastic surgery at Children's Hospital). The goal is to create a department with pediatric subspecialists in every aspect of ophthalmology, something that has not been accomplished elsewhere. Children's Hospital Boston is now the largest department of pediatric ophthalmology in the country, and through continued mentoring of the

academic careers of clinical and research faculty, our influence in the future of the specialty continues to develop.

B. Funding information:**Research funding**

Years covered	Funding source	PI/Co-PI	Grant title
10/92-10/93	National Children's Eye Care Foundation	PI	An enhanced gyroscope deviometer
7/92-7/93	Knights Templar Eye Foundation	PI	Remote sensing of eye position
7/92-7/94	NIH National Research Service Award	Fellow	Remote sensing of eye position
7/93-6/96	Whitaker Biomedical Engineering Foundation Career Development Award	PI	Development of a remote sensor to monitor and track the point of fixation of the human eye
7/94-7/96	JHU School of Medicine	PI	Richard Starr Ross Clinician Scientist Award
10/95-7/98	Niuta and Roy Titus Faculty Development Award	PI	Detecting eye disease in young children
2/1/00-1/31/04	NIH 1R01 EY12883-01	PI	Retinal birefringence analysis in strabismus and amblyopia
7/1/00	Research to Prevent Blindness	PI	Lew R. Wasserman Merit Award
2/1/04-1/31/09	1 R01 EY15298-01 (Elizabeth Engle, PI)	Collaborator	Genetic etiologies of horizontal Strabismus
8/1/05-7/31/10	1 R01 EY12498-06 (Elizabeth Engle, PI)	Collaborator	Molecular basis of congenital strabismus
10/1/05-1/31/08	NOT-EY-05-002 (Elizabeth Engle, PI)	"Co-PI"	NEI administrative supplement to enhance diagnostic genotypic for ophthalmic disease
11/1/04-9/30/06	NIH R03 EY015431 (Michael Ganz, PI)	Consultant	Trends in Use of Eye Care
7/1/05 and 7/1/06	Research to Prevent Blindness	PI	Walt and Lilly Disney Award for Amblyopia Research

C. Report of Current Research Activities

Project	Role
Bench research: Pediatric Vision Screener	PI on R01 grant. Study design, supervision of assistants, data analysis, write and review manuscripts.
Outcome study: Pediatric cataracts: Surgery and optical analysis	PI. Perform cataract surgery in extremely microphthalmic infants. Correlate mathematical predictions of post-operative refractive error with measured outcomes.
Translational research: Genetic etiologies of horizontal strabismus	Collaborator on R01 grant. Perform the clinical (phenotype) characterizations of patients with complex strabismus. These studies have recently led to the identification of several genes that are now implicated in the pathogenesis of the Congenital Cranial Dysinnervation Disorders (such as Congenital Fibrosis of the Extraocular Muscles).
Basic/Translational research: A-beta amyloid in Down Syndrome	Perform clinical characterizations of patient with Down syndrome and cataract to determine presence of A-beta amyloid (Alzheimer's protein); obtain lens material for analysis.

D. Report of Teaching

1. Local contributions
 - a. Medical school.

Years taught	Name of course and description
1992-2002	Ophthalmology clinical elective Attending for one observing medical student for 4-6 hours every 2-4 weeks
2002-2004	Co-director, Pediatric Ophthalmology section, The Lancaster Course for Ophthalmology.
2002-present	Course director: HMS Course #OP503M.7, "Introduction to pediatric ophthalmology." Students observe faculty caring for patients in the clinic and operating room, participate in conferences, and select a project for presentation.

- b. Graduate medical courses

Years taught	Name of course and description
1995-2001	Applied Physics of Biomedicine, Johns Hopkins University Applied Physics Laboratory. Lecturer. Graduate students, 8-10/year. One 3 hour lecture with 6-8 hours preparation time (lecture, homework, exam.)
1996-1998	Physiological Foundations of Medicine, Johns Hopkins University Department of Biomedical Engineering. Lecturer. Graduate and undergraduate students, 60-90/year. Two lectures, 2.5 hours, with 8 hours preparation time (lecture, homework, exam.)

c. Local invited teaching presentations

Years taught	Name of course and description
1997-2000	“Engineering, Medical Research, and Eye Surgery.” Johns Hopkins Krieger School of Arts and Sciences Pre-College Program. Lecturer. Over 100 students, 2 hours preparation and contact time.
2001	Institute for Electrical and Electronics Engineers, Biomedical Engineering Society. “Retinal Birefringence Scanning and Pediatric Vision Screening.” 25 graduate and undergraduate engineers.

d. Continuing medical education

Years taught	Name of course and description
1992-2001	Current Concepts in Ophthalmology, annual review of clinical subject of relevance to practicing clinicians, 2 hours preparation and contact time.
1994-2001	Ophthalmology for the pediatrician, annual lectures on various subjects at Johns Hopkins University and the Greater Baltimore Medical Center, 3 hours preparation and contact time annually.
2004	Frontiers in Pediatric Surgery: Strabismus surgery. Lecture for 250 Boston-area pediatricians. 4 hours preparation and contact time.

e. Advisory and supervisory responsibilities

Years performed	Description of responsibilities
1992-2002	Supervised 12 undergraduate, medical, and graduate engineering students in laboratory research activities, 100 hours per year.

f. Teaching leadership role

Years performed	Title and responsibilities
1992-2002	Chair of Fellowship Committee, Wilmer Eye Institute. Oriented research and clinical fellows to Wilmer Institute to foster interaction between residents, clinical fellows, and research fellows in the classroom, laboratory, and clinic.

g. Names of advisees or trainees

Duration of training	Name	Activity	Current Position
1993-1995, 2000-2002	Saurabh Patel	MS degree	Retina surgeon, Sarasota, FL
1994-1996	Julie Masters	MS degree	Ob/Gyn, Boston
1994-1995	Nathalie Azar	Clinical fellow	Director of Pediatric Ophthalmology, Illinois Eye and Ear Infirmary

1994-1995	Forrest J. Ellis	Clinical Fellow	Pediatric Ophthalmology, University Hospital of Cleveland
1995-1996	Cameron Parsa	Clinical Fellow	Faculty, Wilmer Eye Institute, Johns Hopkins University
1995-1998	Soma Sau	MS degree	US FDA
1996-1997	Garvin Davis	Research elective	Ophthalmology faculty, University of Texas
1996-1998	Ankooor Shah	MS degree	Fully funded MD/PhD student, Einstein University; Ophthalmology Resident, Harvard, 2006
1998-1999	Nainesh Gandhi	MS degree	Medical Student, University of Texas, Dallas TX
1999-2000	Angela Buffenn	Clinical fellow	Faculty, University of Southern California Doheny Eye Institute
2000-2001	Michael Chiang, MD	Clinical fellow	Faculty, Department of Ophthalmology and Research Fellow, Bioinformatics, Columbia University
2001	John van der Zweep, MD	Research elective	Ophthalmology fellow, Canada
2002	Kevin Nusz	Research elective	Ophthalmology resident, Mayo Clinic
2001-2002	Marlet Bazemore, MD	Clinical Fellow	Faculty, Children's National Medical Center
2001-2002	Richard Birdsong, MD	Clinical Fellow	Pediatric ophthalmology, U.S. Army, Ft. Belvoir, VA
2002-2003	Gonzalo Vicente, MD	Clinical Fellow	Private practice, Washington DC
2003-2004	Carolyn Wu, MD	Clinical Fellow	Faculty, Children's Hospital Boston (July 2004)
2004-2005	David Sami, MD	Clinical Fellow	Faculty, Cedars Sinai Medical Center, Los Angeles, CA (July 2005)
2005-2006	Richard Levy, MD	Clinical Fellow	Faculty, Cornell University (Sept 2007)
2006-2006	Norman Fajardo, MD	Clinical Fellow	National Health Service, Manila, Phillipines
2006-2007	Rupa Krishnamurthy, MD	Clinical Fellow	Faculty, Children's Hospital Boston (July 2007)
2006-2007	Yonina Ron, MD	Clinical Fellow	
2007-2008	Sjoukje Loudon, PhD	Post-doctoral Fellow	

2. Regional, national, or international contributions

a. Invited presentations

Years given	Type of Presentation
1992-1996	Optics Review, University of Puerto Rico
1993-2003	Optics Review, The Osler Institute
1994-2000	Optics Review Tufts University
1995, 1996	Visiting Professor, Department of Ophthalmology, King Saud University, Riyadh, Saudi Arabia
1996	Pediatric Ophthalmology and Strabismus, The Lancaster Course
1996-1998	Ophthalmology for the Pediatrician, The Osler Institute
1996-2002	Optics Review, Ophthalmology Service, Brooke Army Medical Center
2000	Visiting Professor, Department of Ophthalmology, University of Pennsylvania Scheie Eye Institute
2001	Visiting Professor, Department of Ophthalmology, University of Toronto
2001	Invited lecture. "Spanning the Millennium: Optics and Optoelectronics," discussion of the impact of optics and optoelectronics on the clinical practice of pediatric ophthalmology, presented at "Spanning the Millennium: Pediatric Ophthalmology," San Diego, California.
2001	Invited lecture: "Vision Screening: Present and Future." American Association of Certified Orthoptists Eastern Regional Meeting
2001	Invited lecture: "Dynamic Retinoscopy." American Association of Certified Orthoptists Annual Meeting.
2001	Invited lecture: "Vision Screening Today and Tomorrow." Mexican Association of Pediatric Ophthalmology.
2002	Invited lecture: "Retinal birefringence and pediatric vision screening." Association for Research in Vision and Ophthalmology - Special Interest Group ("Pediatric Vision Screening and Photoscreening.")
2002	Invited lectures: "Timing of strabismus surgery in patients with amblyopia," and "Amblyopia therapy." Cleveland Clinic symposium on amblyopia.
2002	Invited lecture: "Ocular complications of Anesthesia." Ophthalmic Anesthesia Society annual meeting.
2002	Invited lecture: "Pre-operative optical considerations." American Orthoptic Council Symposium: "Preventing and Managing the Complications of Strabismus Surgery"
2002	Invited paper discussant: "Magnetic resonance imaging of the inferior oblique muscle in superior oblique palsy with over-elevation in adduction," by R. Kono and J. Demer, American Academy of Ophthalmology annual meeting.
2003	Visiting professor: University of Missouri – Kansas City, Department of Ophthalmology, Resident, Research & Alumni Weekend, June 6-7, 2003, Kansas City, Missouri
2003-2007	Invited optics lecture, "San Antonio Ophthalmology Review Course," San Antonio, TX.

2003	Invited paper discussant: "Editors choice: Best papers of the year." American Academy of Ophthalmology annual meeting, Nov. 16, 2003.
2003	Invited lectures: "Torsion" and "Dynamic retinoscopy." American Association of Certified Orthoptists annual meeting, Anaheim, CA, Nov. 15, 2003.
2004	Keynote Speaker, Australian College of Behavioural Optometry, ACBO, Melbourne, Australia
2004	Visiting Professor, Royal Victorian Eye & Ear Hospital, University of Melbourne, Melbourne, Australia
2004	Visiting Professor, University of Illinois Eye and Ear Infirmary
2005	Visiting Professor, Dalhousie University, Halifax, Nova Scotia, Canada
2005	Invited lectures, "Optics and Refraction," First Annual Penn Ophthalmology Review Course, Philadelphia, PA
2005	Invited lectures, "Optics and Refraction," Bascom Palmer Eye Institute, Miami, FL

3. Teaching awards received

1994-2001: Faculty teaching award, The Osler Institute

1996: L. Harrell Pierce Wilmer Resident Teaching Award.

2004: *Nominee*, Harvard Medical School Student Teaching Award

2005: Robert A. Petersen Resident Teaching Award, Children's Hospital Boston

4. Major curriculum offerings

1992-2002. Baltimore Pediatric Ophthalmology Journal Club (organized and supervised; acquired and maintained CME accreditation)

2002. Created Greater Boston Pediatric Ophthalmology Journal Club.

2002-2005. Organized Greater Boston Pediatric Ophthalmology Journal Club

E. Report of Clinical Activities

1. Description of clinical practice

- Strabismus: Botulinum toxin injections into extraocular muscles, adjustable suture eye muscle surgery in children and adults, adult strabismus diagnosis and correction. Enlarging national referral base of patients referred specifically to me from California, Colorado, Florida, etc.
- Congenital Cranial Dysinnervation Disorders including Congenital Fibrosis of the Extraocular Muscles and Duane Syndrome: Evaluation and treatment of these highly complex strabismus cases. I am now treating 1-2 CFEOM patients per month, whereas most pediatric ophthalmologists will see only 1 of these cases every 1-2 years. We now

utilize Dr. Engle's CLIA-approved laboratory routinely to identify mutations in patients suspected of having variants of CFEOM.

- Evaluation and treatment of adults with diplopia after macular translocation surgery.
- Laser treatment of retinopathy of prematurity and other pediatric retinal diseases.
- Amblyopia therapy including alternatives to traditional patching therapy.
- Pediatric cataract surgery with intraocular lens insertion.

2. Patient load

Current practice is 60% pediatric, 40% adult strabismus. 40% Clinical effort representing 2000-2500 patient encounters and 100-150 surgical procedures annually.

3. Clinical Contributions

Clinical assessment and treatment: Designed and built a gyroscope deviometer, a device used to clinically quantify ocular misalignment in patients unable to cooperate for traditional testing. Other clinical contributions as described in publications above and in bibliography, including revision of the prognosis of congenital exotropia, improved assessment and management of patients with congenital cataract and microphthalmia, and introduction of a new surgical procedure for treatment of superior oblique muscle overaction.

Clinical documentation and computerized patient records: I have redesigned nearly all of the clinical forms used in the Department of Ophthalmology in an attempt to facilitate patient flow, improve dictation speed, enhance patient communication, promote compliance with Medicare documentation standards, and set the stage for the eventual transition to a purely electronic medical record. My patient information form, "Atropine penalization – what to expect" was awarded an American Association for Pediatric Ophthalmology and Strabismus (AAPOS) award for quality, utility, and clarity of clinical paperwork. My "Clinical Evaluation Form" and "Patient History / Review of Systems Questionnaire" were both selected as exemplary work by the AAPOS electronic patient record committee and recommended as a minimum clinical documentation standard for AAPOS members. I successfully implemented a paperless scanned medical record system at Children's Hospital Boston; we have not created a new paper chart since 2002.

4. Other relevant information about clinical role

Media relationships:

- Pediatric cataracts. Pediatric cataract patient featured in August, 1999 Johns Hopkins Dome magazine ("Kindness award") and additional positive media coverage in Baltimore Magazine feature article, September, 1999 ("Blind Faith"). Special recognition at JHU Initiative dinner, October, 1999, for combining clinical expertise in pediatric cataract surgery with research excellence in early detection for the benefit of optimal patient care.
- Other aspects of pediatric ophthalmology and presence in local and national media promoting pediatric ophthalmology expertise / advocacy:
 - *InteliHealth* stories on child's eye safety, amblyopia, strabismus, vision training, and pediatric cataracts. Published at www.intelihealth.com.

- WJHU radio “*Medical Minute*” interviews on early detection and treatment of eye disease
- *National Public Radio* and *Baltimore Sun* interviews commenting on research regarding myopia and the use of night lights in infancy.
- *WBZ-TV 4, Boston* – news story on treatment for pediatric cataract, broadcast nationally by CBS affiliates. <http://wbz.dayport.com/launcher/2571/>
- *Press conference* – state of Illinois Amblyopia Awareness Initiative, joined first lady Patty Blagojevich to discuss the importance of early awareness and treatment of amblyopia to assembled reporters.
- *New York Times* – interview featured in article about early screening for amblyopia. “Add depth to life with early eye exam,” by Jane Brody, May 17, 2005.
- *Children’s Hospital Boston* – Complete revision of Children’s Hospital Ophthalmology web site with expanded patient education features.
- *WHDH TV 7, Boston* – news story on scanning eyes for amblyopia
mms://wm.world.mii-streaming.net/media/whdh/windowsmedia/features/3/060410_sensing_sight.wmv

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