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**Education**

<u>Year(s)</u>	<u>Degree</u>	<u>Field of Study</u>	<u>Institution</u>
1984	BSc. (summa cum laude)	Physics	University of Toronto, Toronto
1988	MSc.	Theoretical Physics Charles J. Lumsden	University of Toronto, Toronto
1989	M.D.		University of Toronto, Toronto

**Postdoctoral Training**

<u>Year(s)</u>	<u>Title</u>	<u>Specialty/Discipline</u>	<u>Institution</u>
1989-1990	Internship	Rotating	St. Paul's Hospital Vancouver BC Canada
1990-1994	Residency	Radiology	Vancouver General Hospital, Vancouver BC Canada
1994-1996	Fellowship	Neuroradiology & Pediatric Neuroradiology	University of California, San Francisco

**Faculty Academic Appointments**

<u>Year(s)</u>	<u>Academic Title</u>	<u>Department</u>	<u>Academic Institution</u>
1996-1998	Assistant Professor	Radiology	University of California, San Francisco
1998-2002	Instructor	Radiology	Harvard Medical School
2002-	Assistant Professor		Harvard Medical School
2005-	Assistant Professor	Radiology	Member of the Affiliated Faculty of the Harvard-MIT Division of Health Sciences and Technology
2007-	Associate Professor	Radiology	Harvard Medical School
2007-	Associate Professor	Radiology	Member of the Affiliated Faculty of the Harvard-MIT Division of Health Sciences and Technology

**Appointments at Hospitals/Affiliated Institutions**

<u>Year(s)</u>	<u>Position Title</u>	<u>Institution</u>
1996-1998	Assistant Radiologist	University of California, Medical Center, San Francisco
1998-2002	Assistant Radiologist Radiology	Massachusetts General Hospital
2002-	Associate Radiologist Radiology	Massachusetts General Hospital

**Major Administrative Leadership Positions**

<u>Year(s)</u>	<u>Position Title/Institution</u>
1996-1998	Director, MRI Protocol Development, Neuroradiology Section, UCSF
1999-2000	Director, Neuroradiology MRI Protocol Development, Massachusetts General Hospital
2000-	Director, Pediatric Neuroradiology, Massachusetts General Hospital
2003-2008	Director Advanced MRI Imaging CME Course, Harvard Medical School
2004-2009	Chief, Division of Pediatric Radiology
2005	Director, Pediatric Radiology Review Course, Harvard Medical School
2009	Director of Fetal and Neonatal Neuroimaging Research, Department of Radiology, CHB
2009-	Founding Director, Fetal-Neonatal Neuroimaging & Developmental Science Center, Children's Hospital, Boston

**Committee Service**

<u>Year(s) of Membership</u>	<u>Name of Committee</u>	<u>Institution/Organization</u>
<i>Local</i>		
2000-2002	Pediatric Friendly Task Force	Massachusetts General Hospital
2001-2003	Committee to Improve Safety of Neonatal MR Imaging	Massachusetts General Hospital
2003-2005	Subcommittee on Review of Research Proposals (SRRP) of the MGH Executive Committee on Research (ECOR)	Massachusetts General Hospital
<i>National</i>		
2000-2001	Committee to Develop Practice Parameters in Neonatal Neuroimaging (Guidelines accepted Feb 2002 and reaffirmed 2005)	National Institute of Health
2001-2009	Research Committee	American Soc Pediatric Neuroradiology (ASPNR)
2005-	NIMH Council Work Group on MRI Research Practices	National Institute of Mental Health
2006	Workshop on Biomarkers of Epileptogenesis	NINDS
2008-2009	Executive Board	American Soc Pediatric Neuroradiology
2009-2010	Research Committee Chair	American Soc Pediatric Neuroradiology Biomedical Imaging Technology

*International*

2006-2010	Annual Meeting Program Committee	International Soc of Magnetic Resonance in Medicine
2010	Young Investigator Award Committee	International Soc of Magnetic Resonance in Medicine
2010	Executive Committee	International Soc of Magnetic Resonance in Medicine

**Professional Societies**

<u>Year(s) of Membership</u>	<u>Society Name</u>
1990-	Radiological Society of North America
1994-	American Society of Neuroradiology
1997-	International Society of Magnetic Resonance In Medicine
1998-	American Medical Association
1999-	American Society of Pediatric Neuroradiology (ASPNR)
2000-	Canadian Association of Radiologists
2003-	The Society for Pediatric Radiology
2003-	Society for Neuroscience
2005-2008	American Society of Functional Neuroradiology

**Grant Review Activities**

<u>Year(s) of Membership</u>	<u>Name of Committee</u>	<u>Organization</u>
2001	P41 Grant, Ad hoc reviewer	National Institute of Health (NIH)
2005	P41 Grant, Ad hoc reviewer	NIH
2006	PPG review committee	
	ZNS SRB-M	NINDS, NIH
2008	NDS-K ANS1 SRB (26) Review Committee	NINDS, NIH
2009	BMIT	NBIB
2010	Developing & Advance Centers for Intervention and Services Research 2011/01	NIH/NIMH

**Editorial Activities**

1997-	Reviewer	American Journal of Neuroradiology
1997-	Reviewer	Radiology
1997-	Reviewer	Journal of Magnetic Resonance Imaging
2000	Guest Reviewer	Teratology
2001-	Reviewer	Neuroimage
2004-	Reviewer	Journal of Computer Assisted Tomography
2004-	Reviewer	American Journal of Radiology
2004-	Reviewer	Journal of Neurology, Neurosurgery, and Psychiatry
2004-	Reviewer	Pediatric Radiology
2009	ad hoc Reviewer	Cerebral Cortex

**Honors and Prizes**

<u>Year</u>	<u>Name of Honor/Prize, Awarding Organization</u>
1980-1984	Faculty Scholar, University of Toronto
1980-1984	Open Admission Scholarship, University of Toronto
1981	Brant Award, University of Toronto
1981	Mary Cowen Rowell Scholarship, University of Toronto
1981	Summer Research Scholarship, University of Toronto
1982	Edward Blake Scholarship in Physics, University of Toronto
1983	Susan D. Massey Scholarship in Science, University of Toronto
1984	Honors BSc. with High Distinction, University of Toronto
1984	Sir J.C. McLennan Prize in Physics, University of Toronto
1984	Dr. W. Clark Horning Scholarship, University of Toronto
1985	National Science and Engineering Research Council Postgraduate Scholarship in Physics
1986	I'Anson Scholarship, University of Toronto Medical School
1987	George Brown Memorial Award for Research Accomplishment
1988	George Brown Memorial Award for Research Accomplishment
1992	Third Prize in Congress Award Session at the Canadian Association of Radiologists Annual Meeting
1996	RSNA Research Fellowship, ASNR Research Fellowship in Basic Science (declined in order to accept the RSNA Research Fellowship)
2001-2003	Clafflin Distinguished Scholar Award (Massachusetts General Hospital)
2006	Caffey Award for Best Clinical Science Paper at the joint meeting of the Society for Pediatric Radiology and European Radiology Society (first author)
2006	Caffey Award for Best Poster at the joint meeting of the Society for Pediatric Radiology and European Radiology Society (senior author)
2007	Associate Professor, Harvard Medical School
2007	Derek Harwood-Nash Award from the American Society of Pediatric Neuroradiology for best Pediatric Neuroradiology paper presented at ASNR 2007
2008	Nominated for outstanding clinician award, MGH
2008	Best lecture, Advanced Brain MRI Course at ISMRM 2008
2009	First incumbent of the Children's Hospital Boston (CHB) Chair in Neonatology

**Report of Funded and Unfunded Projects****Funding Information**Year(s) fundedRole on project & grant details*Past*

1995-97	Central reader and consultant Alkermes Study ALK01-017 A Randomized, Double -Blind, Placebo-Controlled, Phase II Study of RMP-7 in Combination with Carboplatin Administered Intravenously for the Treatment of Recurrent Malignant Glioma
1996-98	Principal Investigator UCSF Radiology Research and Education Fund Imaging White Matter Tracts with Diffusion Weighted Imaging
1996-98	Principal Investigator Radiological Society of North America (RSNA) Research Fellowship Use of MRI Technology and Mathematical Analysis to Increase Accuracy and Reduce Cost of Epilepsy Evaluation
1997-98	Co-investigator Academic Senate Grant (Internal UCSF Grant) Shared instrumentation grant for purchase of Neurovascular Phased Array Coil
1997-98	Principal Investigator Contracted by Alkermes Cerebral Blood Volumes and Permeability Measurements in Patients with Glioblastoma Multiforme
1999-00	Consultant R24 (Gary B Baskin) An Animal Model for Gene Therapy of Inherited Disorders
2001-03	Principal Investigator Claflin Distinguished Scholar Award (Internal MGH Grant) \$100,000 Human Perinatal Brain Injury and Outcome: MR Assessment
2002-07	Principal Investigator NIH K23 NS42758-01 (\$790,175) Human Perinatal Brain Injury and Outcome: MR Assessment
2002-04	Co-Investigator Armenise Grant (Internal MGH Grant) (PI Verne Caviness, Neurology MGH) Chemotherapy for ALL and the Developing Brain
2002-07	Co-Investigator R01 (PI Maria-Angela Franceschini) Optical monitoring of cerebral oxygenation in infants
2001-06	Consultant R01 (PI Christopher Walsh) Human epilepsy genetics: neuronal migration disorders.
2007-08	PI Ellison Foundation (\$100,000) Autism and Dyslexia
2007-08	PI BRACCO

## A Phase II Multi-Center Open-Label Study

2006-08 Investigator National Multiple Sclerosis Society (Chitnis)  
Partners Pediatric Multiple Sclerosis Center at the MGH for Children

*Current*

2007-12 Investigator 5R01 HD42908-05 (Franceschini)  
NIH/NICHD  
Optical Monitoring of Cerebral Oxygenation in Infants

2008-10 Investigator Capetown S/C (Van der Kouwe)  
Neural Technology for Pediatric Developmental Disorders in South Africa

2008-11 Investigator Thrasher Research Fund (Nelson)  
Correlation of deep gray structure volume and cognitive outcome in neonates  
exposed to HII.

2008-10 PI NIH R21EB008547-01A1 (\$272,724)  
Multichannel Coils and Motion Correction for Developing Brain

2009-11 PI Fidelity (\$199,078)  
Improving Pediatric Neuroimaging

2009-11 PI NIHR21HD058725-01A1 (\$274,805)  
A Multimodal Approach to Estimating Newborn Brain Oxygen Metabolism  
CMR02

2010-13 PI NSF 0959294 (\$3,718,244)  
Collaborative Development of a Novel Pediatric Magnetoencephalography System

**Report of Local Teaching and Training****Teaching of Students in Courses**

Year(s)                      Course title

Type of student/audience

Role in course

Level of effort

1984-85      4th year Physics Course, Theoretical Physics in Biology (University of Toronto)  
Lecturer  
Four 1 hour lectures: "The Human Nervous System"  
Approximately 20, 4<sup>th</sup> year physics majors  
Preparation time: weeks

1994-96      Medical Student Radiology Elective Teaching, University of California, San Francisco  
Lecturer  
One, one hour lecture per month  
Approximately 15 medical students

Preparation time: Hours

- 2000 Human Nervous System and Behavior  
Lecturer  
One hour lecture: “Imaging the Human Nervous System”  
Harvard Medical School and Harvard School of Dental Medicine  
Approximately 170 students, 2<sup>nd</sup> year class  
Preparation time: days
- 2001 Human Nervous System and Behavior  
Lecturer  
Two, one hour lectures: “Imaging the Human Nervous System: The Basics” and  
“Imaging the Human Nervous System: Functional Imaging”  
Participation in preparation of Course Syllabus, Neuroimaging Lab  
Harvard Medical School and Harvard School of Dental Medicine  
Approximately 170 students, 2<sup>nd</sup> year class  
Preparation time: weeks
- 2002 Human Nervous System and Behavior  
Lecturer  
One hour lectures: “Imaging the Human Nervous System: The Basics”  
Harvard Medical School and Harvard School of Dental Medicine  
Approximately 170 students, 2<sup>nd</sup> year class  
Preparation time: hours
- 2003 BIO95hf  
Guest Lecturer  
One 2 hour lecture: “Imaging the Human Nervous System: Cell Death and Derangement”  
Harvard Medical University  
6 students, 2<sup>nd</sup> year class  
Preparation time: hours
- 2005 HST Thesis Program Expert Readers  
Invited Reader/Oral Examiner of Annemarie Stroustrup Smith’s M.D. Thesis entitled “  
Fetal Magnetic Resonance Imaging in the Antenatal Diagnosis of Congenital Anomalies”  
Preparation time: 5 hours

### **Formal Teaching of Residents, Clinical Fellows and Research Fellows (post-docs)**

<u>Year(s)</u>	<u>Title</u>	<u>Level of effort</u>
<u>Type of student/audience</u>		
1997-98	Resident Board Review Course run by University of California, San Francisco Lecturer One half hour lecture, “Brain Tumors: Key Points and Differential Diagnosis” Approximately 300 residents Preparation time: Days	

1997-	Informal Resident Review Session for Oral Boards Preparation Lecturer One to two, two hour review sessions Approximately 10 residents Preparation time: Hours
2004	BWH/MGH Radiology Review Lecturer One 40 minute lecture on Pediatric Neuroradiology
2000-08	Neuroradiology Fellow lectures. Minimum three one-hour lectures per year.
2000-08	Pediatric Residents, One one-hour lecture per year
2000-08	Pediatric Endocrinology Fellows One to two one-hour lectures per year
2000-08	Pediatric Neurology Fellows One to two one-hour lectures per year
2000-09	Radiology Resident MiniCourse One to two one-hour lectures per year
2009-2010	**

### **Clinical Supervisory and Training Responsibilities**

<u>Year(s)</u>	<u>Type of responsibility</u>	<u>Level of effort</u>
2004-09	Pediatric Neuroradiology Fellowship Director	40%

### **Laboratory and Other Research Supervisory and Training Responsibilities**

<u>Year(s)</u>	<u>Type of responsibility</u>	<u>Level of effort</u>
2002-09	Supervisor Pediatric Neuroradiology Research	40%
2009-	Director of Fetal and Neonatal Neuroimaging and Developmental Science Center	80%

### **Formally Supervised Trainees**

<u>Year(s)</u>	<u>Name and degrees</u>	<u>Current position</u>
1997-1998	Primary supervisor for Cynthia Chin, M.D., Tumor Volume Measurements. Comparison of Visual, Linear, Semiautomated and Manual Techniques (~ 2 hours/week = ~ 100 hours/year)	Neuroradiology Fellow

- 1997-1998 Primary supervisor for Fazil Gelal, M.D., visiting fellow from Turkey. Diffusion Weighted Imaging in Normal and Abnormal Children  
(~ 5 hours/week = ~ 250 hours/year)
- 1999 Supervisor for Nandita Guha M.D., Diffusion Imaging in Primary CNS Lymphoma and Changes That Occur in Response to Treatment  
(~ 2 hours/week = ~ 250 hours/year)
- 1999 Supervisor for Whitney Edminster MD. PhD., MR Spectroscopy in Epilepsy  
(~30 hours total)
- 1999 Supervisor for Anna Zourabian MS., Diffuse Optical Tomography of the Neonate  
(~ 5 hours/week = ~ 250 hours/year)
- 2000-2001 Supervisor for Ganesh Mochida M.D., Correlation of 2 year clinical outcome with perinatal MR imaging in perinatal encephalopathy.  
(~ 1 hours/ week)
- 2000-2001 Supervisor for Yelda Ozsunar M.D., Fractional Anisotropy Changes in Stroke: Correlation with Perfusion Weighted Imaging  
(~ 4 hours/week = ~200 hours/ year)
- 2001-2002 Supervisor for Thierry Huisman M.D., Diffusion Imaging in ADEM  
(~ 1 hour/week)
- 2002-2003 Supervisor for Susanne Knake M.D., 3T Imaging of Epilepsy Patients  
(~ 3 hours/week). Currently in the Department of Neurology, Phillips University, Germany
- 2003-2004 Supervisor for Melina Pectasides, M.D., Martinos Fellow, DTI of Pediatric Respiratory and Respiratory Followed by Cardiac Arrest, Optimization of Neonatal Diffusion Weighted Imaging. Currently is a Fellow at MGH  
(~2 hours /week)
- 2003-2005 Supervisor for Kant Matsuda, M.D. PhD, Histogram analysis of Neonatal Brain Injury on ADC Maps (~5 hours/week). Currently works in Research Pathology at the NIH.
- 2003-2004 Supervisor for Mitsushiru Nishida, Research Fellow, Center for Morphometric Analysis, in his analysis of neonatal brains, Currently at School of Medicine, Keio University, Tokyo, Japan
- 2004- Supervisor for Rudolph Pienaar, PhD, now an Instructor in Radiology in his creation of software tools to create and analyze the cortical folding pattern in infants and young children. Currently at Childrens Hospital Boston.
- 2005- Supervisor for Myong-sun Choe MD, Research Fellow, Previously at Center for Morphometric Analysis in the creation of a protocol for segmenting neonatal and infant

brains and in the analysis of the results, Funded by the Hearst Foundation and now at Childrens Hospital Boston funded by the Thrasher Fund

- 2005-2006 Supervisor for Pallavi Sagar, MD, Pediatric neuroradiology fellow in her research projects and publications. Currently Staff Radiologist at Massachusetts General Hospital
- 7/2006- Supervisor for Bindu N. Setty, M.D. Pediatric neuroradiology fellow in her research projects and publications. Currently Pediatric radiology fellow at MGH.
- 1/2008- Supervisor for Mellekate S. Vishwa, MD, Visiting Researcher
- 7/2008- Supervisor for Neel Madan, M.D. Pediatric neuroradiology fellow
- 10/2008- Supervisor for Patric Hagmann, M.D. Visiting Radiology Resident, Research Fellow
- 2009- Supervisor for Emi Takahashi, PhD, Instructor in Pediatrics
- 2009- Supervisor for Tomo Tarui, MD, Research Fellow
- 2009- Advisor for Michael Paldino, MD, Attending Radiologist
- 2009- Supervisor for Kiho Im, PhD, Research Fellow
- 2010- Supervisor for Mathieu Dehaes, PhD, Research Fellow
- 2010- Supervisor for Emiko Hayashi, PhD, Research Fellow

### **Formal Teaching of Peers (e.g., CME and other continuing education courses)**

<u>Year(s)</u>	<u>Title or topic of talk</u>
1994-98	Visiting Fellowship Program in Neuroradiology Lecturer 4-6 hours monthly to Visiting Post-graduate physicians at UCSF MRI visiting fellowship courses (~20 attendees/session)
1996	UCSF Clinical Magnetic Resonance Imaging Meeting, San Francisco Lecturer Three lectures: "New Applications: High Resolution Phased-Array Imaging of the Brain", "Brain Tumors and Pitfalls", "New Technical Updates: A Critical Review of Clinical Utility". (~300 post-graduate physicians)
1997	UCSF Clinical Magnetic Resonance Imaging Meeting, San Francisco Lecturer Two lectures: "Imaging in Epilepsy", "New MR Techniques: Echo Planar, Diffusion, Perfusion." (~300 post-graduate physicians)

- 1997 Applications in Diagnostic Radiology, UCSF Review Course in Cancun  
Lecturer  
Five lectures: “Imaging in Epilepsy”, “Stroke”, “Brain Tumors and Pitfalls”, “CNS Infections”, “Back Pain”. (~40 post-graduate physicians)
- 1998 Clinical Neurosciences By the Bay: Neuroradiology, Neurosurgery and Neurologic Management  
Lecturer  
Two lectures: “Diffusion/ Perfusion Applications”, “Imaging: New Advances in Detection of Epilepsy Foci.” Panalist on Cerebral Ischemia Section (~300 post-graduate physicians)
- 1998 UCSF Clinical Magnetic Resonance Imaging Meeting in San Francisco  
Lecturer  
Two lectures: “Diffusion and Perfusion: Clinical Applications”; “Epilepsy”.  
Moderator of Cerebral Ischemia Section (~300 post-graduate physicians)
- 1998 41st Annual Diagnostic Radiology Postgraduate Course, San Francisco  
Lecturer  
One lecture: “Diffusion Imaging in Clinical Practice”. (~300 post-graduate physicians)
- 1998 Harvard Medical School/MGH Child Neurology Course  
Lecturer  
One lecture: “Fetal and Perinatal Imaging”. (~150 post-graduate physicians)
- 1998 Harvard Neurovascular Review Course, Minutes Count: Update on New Techniques and Review of Established Principles of Management of Cerebrovascular Emergencies  
Lecturer  
Two lectures: “Confirming the Diagnosis of Acute Stroke”, “Radiological Diagnosis of Hemorrhage”, (~25 post-graduate physicians)
- 1999 Harvard Neurology Review Course  
Lecturer  
One lecture: “Imaging In Epilepsy”, (~150 post-graduate physicians)
- 1999 Harvard Medical School/MGH Neuroradiology Course  
Lecturer  
Two lectures: “Pediatric Brain Tumors”, “Ultrahigh resolution imaging in Epilepsy”, (~300 post-graduate physicians)
- 1999 Harvard Medical School/MGH Child Neurology Course  
Lecturer  
One lecture: “Perinatal Injury: Assessment with MRI”, (~150 post-graduate physicians)
- 1999 Harvard Medical School/MGH Neurology Course

- Lecturer  
 “Diffusion and Perfusion Imaging in Stroke”  
 (~150 post-graduate physicians)
- 2000-2002 Clinical Functional MRI 2000. Harvard Medical School/MGH/Athinoula A. Martinos Center for Biomedical Imaging  
 Lecturer  
 “Diffusion and Perfusion Imaging in the Pediatric Population”, (~60 post-graduate physicians)
- 2001 Harvard Medical School/MGH Child Neurology Course  
 Lecturer  
 Two lectures: “Perinatal Brain Injury”, “Advances in MR Imaging of Epilepsy”
- 2002 Cleveland Clinic Epilepsy Course  
 Lecturer  
 One lecture: “Advanced MR Techniques in the Evaluation of Epilepsy”
- 2002 Harvard Medical School/MGH Child Neurology Course  
 Lecturer  
 Two lectures: “Perinatal Brain Injury”, “Advances in MR Imaging of Epilepsy”
- 2002 Harvard Medical School/MGH Neuroradiology Course  
 Lecturer  
 “Acute Perinatal Brain Injury”, (~150 post-graduate radiologists)
- 2002 Harvard Medical School/MGH Pediatric Radiology Course  
 Lecturer  
 3 lectures: “Neonatal Brain Injury”, “Pediatric CNS Emergencies”, “Congenital Cerebral Malformations”, (~200 post-graduate radiologists)
- 2003 Clinical Functional MRI. Harvard Medical School/ Athinoula A. Martinos Center for Biomedical Imaging  
 Lecturer  
 “Diffusion and Perfusion Imaging in the Pediatric Population”, “Perfusion Imaging: The Basics”, (~60 post-graduate physicians)
- 2003 Harvard Medical School/MGH Neuroradiology Course  
 Lecturer and Organizer  
 Four lectures: “Normal Development”, “Neonatal Brain Injury”, “Acute Pediatric Brain Injury”, “Epilepsy / Congenital Malformations”, (~200 post-graduate radiologists)
- 2003 Harvard Medical School/MGH Child Neurology Course  
 Lecturer  
 “Acute Perinatal Brain Injury”, “Leukodystrophies”, “Metabolic Disorders”, “Epilepsy and Congenital Malformations”, (~150 post-graduate radiologists)

- 2003 Harvard Medical School/MGH Pediatric Radiology Course  
Lecturer  
Two lectures: “Neonatal MR Imaging”, “Pediatric Perfusion and Diffusion”, (~100 post-graduate radiologists)
- 2004 Clinical Functional MRI. Harvard Medical School/ Athinoula A. Martinos Center for Biomedical Imaging  
Lecturer  
“Diffusion and Perfusion Imaging in the Pediatric Population”, “Perfusion Imaging: The Basics”, (~150 post-graduate physicians)
- 2004 Harvard Medical School/MGH Neuroradiology Course  
Lecturer  
“Acute Pediatric Brain Injury”, “Epilepsy / Congenital Malformations” (~200 post-graduate radiologists)
- 2004 Harvard Medical School/MGH Child Neurology Course  
Lecturer  
“Acute Perinatal Brain Injury”, “Leukodystrophies”, “Metabolic Disorders”, “Epilepsy and Congenital Malformations”, (~150 post-graduate radiologists)
- 2005 Clinical Functional MRI. Harvard Medical School/ Athinoula A. Martinos Center for Biomedical Imaging  
Lecturer  
“Diffusion and Perfusion Imaging in the Pediatric Population”, “Perfusion Imaging: The Basics”, (~60 post-graduate physicians)
- 2005 Harvard Medical School/MGH Neuroradiology Course  
Lecturer  
“Acute Pediatric Brain Injury”, (~200 post-graduate radiologists)
- 2005 Harvard Medical School/MGH Child Neurology Course  
Lecturer  
“Acute Perinatal Brain Injury”, “Leukodystrophies”, “Metabolic Disorders”, “Epilepsy and Congenital Malformations”, (~150 post-graduate radiologists)
- 2006 Advances in 3 Tesla Neuro Imaging  
“3T Perfusion Imaging Update”  
“Arterial Spin Labelling: Promises Challenges & Case Studies”
- 2006 Neuroimaging Advances (Previously Clinical Functional MRI). Harvard Medical School/ Athinoula A. Martinos Center for Biomedical Imaging  
Lecturer and primary organizer  
“Clinical Applications of ASL in Pediatrics”, “Diffusion and Perfusion in Mechanisms of Cell Death”, “Early Brain Development”, “Diffusion MRI Basics” (~60 post-graduate physicians)

2006	Harvard Medical School/MGH Neuroradiology Course Lecturer “Epilepsy in Children”, “White Matter Disease in Children” (~200 post-graduate radiologists)
2006	Harvard Medical School/MGH Pediatric Radiology Course Lecturer and primary organizer “Diffusion MRI Basics”, “High Field and Sense Imaging”, “Perfusion MRI Basics”, “Neonatal Brain Injury”, (~50 post-graduate radiologists)
2009	Harvard Medical School/MGH Post Graduate Course Lecturer “Pediatric Stroke”

### **Local Invited Presentations**

<u>Year(s)</u>	<u>Title/Type of presentation</u>
1989	Grand Rounds Department of Psychiatry, University of Toronto Lecturer One hour lecture: “Theoretical Physics: Searching for a Link Between Mind and Brain” Approximately 60 Psychiatry faculty and residents
1995	Radiology Imaging Lab, UCSF Medical Center Lecturer One hour lecture: “Fractal Analysis of Cortical Dysplasias” Approximately 40 radiology faculty
1999	Grand Rounds - Neurology MGH Lecturer One hour lecture: “High Resolution Phased Array Imaging of the Brain” Approximately 50 Neurology faculty and residents
1999	Grand Rounds - Neurosurgery MGH Lecturer One hour lecture: “High Resolution Phased Array Imaging of the Brain” Approximately 50 Neurology faculty and residents
2000	Grand Rounds – Pediatric Neurosurgery, Children’s Hospital, Boston Lecturer One hour lecture: “Current and Future Imaging Techniques for Epilepsy Evaluation” Approximately 50 Pediatric Neurology and Neurosurgery faculty and residents
2001	Grand Rounds – Obstetrics and Gynecology, Massachusetts General Hospital Lecturer One hour lecture: “MR Imaging of Perinatal Brain Injury”
2001	Grand Rounds – Neurology, Massachusetts General Hospital

	Lecturer One hour lecture: “MR Imaging of Perinatal Brain Injury”
2004	Grand Rounds – Neurosurgery, Massachusetts General Hospital Lecturer
2004	Newton Wellesley Hospital Pediatric Grand Rounds Pediatric Stroke One hour lecture: “MR Imaging Advances in Pediatric Brain Injury”
2004	Affiliated Pediatric Practice (Pediatric Practice of Partners Community Healthcare Inc) Guidelines for Imaging Headache
2005	Newton Wellesley Hospital Pediatric Grand Rounds Neuroimaging Basics
2005	Obstetrics and Gynecology Grand Rounds Neonatal Brain Injury
2006	Affiliated Pediatric Practice (Pediatric Practice of Partners Community Healthcare Inc) Guidelines for Imaging Headache
2009-2010	** CHB Grand Rounds, Multiple Departments – update needed

### **Report of Regional, National and International Invited Teaching and Presentations**

#### **Regional, National and International Invited Presentations and Courses**

Year	Title of presentation or name of course
1991	Cooper Union Architectural School, New York One hour lecture: “Architecture in 2.76 Dimensions: Ideas from Medicine”
1991	New York University Medical Center Radiology Department Lecturer One hour seminar: “Using fractal analysis to quantify pixel intensity patterns”
1997	ISMRM Fast MRI Workshop: Methodological Perspectives and Advances in Cardiac, Neuro, Angiography and Abdominal Imaging One 30 minute lecture: “Fast Neuroimaging with High SNR Phased Array Coils”
1998	Japan Society for CNS Computed Imaging Japan Society of MR Angiography Two 1 hour lectures: “Neuroimaging with Phased Array Coils”, “Diffusion Imaging: Techniques, Pitfalls, Clinical Applications”
1999	ISMRM International Meeting, Clinical Review Course Half hour lecture: “High Resolution Phased Array Imaging”
2000	International Course of Radiology and Imaging, Mexico City. Distinguished Guest Lecturer

- Three 30 minute lectures: “Diffusion Weighted Imaging in Clinical Practice”, “Perfusion Weighted Imaging in Clinical Practice”, “Functional MR Imaging in Clinical Practice”
- 2000 Optical Imaging in Infants (Course organized by Britton Chance at CHOP)  
One 20 minute talk: “Functional Optical Imaging in the Neonate”.
- 2001 American Neuroradiology Society (ASNR) Annual Meeting  
“The Differential Diagnosis of Decreased ADCs”
- 2002 New England Roentgen Ray Society (NERRS) Annual Meeting  
“The Differential Diagnosis of Decreased ADCs”
- 2003 American Roentgen Ray Society (ARRS) Annual Meeting  
“Congenital Brain Malformations”,  
“Myelination and White Matter Disorders”
- 2003 American Epilepsy Society Annual Meeting  
“Neuroimaging: Advances and Applications: Structural MR Imaging”
- 2003 American Neuroradiology Society (ASNR) Annual Meeting  
“Basics and Clinical Applications of DWI”
- 2004 Cleveland Clinic Advanced Epilepsy Management Symposium  
“MRI in Evaluation of Patient with Epilepsy
- 2004 American Epilepsy Society Annual Meeting, Merritt-Putnam Symposium  
“Imaging the Developing Epileptic Brain”
- 2004 American Society of Neuroradiology  
“Basics and Clinical Applications of DWI”
- 2004 Eastern Neuroradiology Society  
“Neuroimaging of Pediatric Emergencies”
- 2004 Visiting Professor, Vancouver General Hospital, BC Canada  
Grand Rounds for Neuroscience, “Advances in Epilepsy Imaging”
- 2005 American Society of Neuroradiology  
“Imaging the Neonate and Young Infant”
- 2005 A symposium on Neurodevelopment at Texas A&M University  
“Imaging Brain Growth: MRI Morphometrics and Novel Measures”
- 2006 Congress of Neurosurgeons Annual Meeting  
“Imaging of Cortical Dysplasias”
- 2006 American Society of Functional and Stereotactic Neurosurgeons  
Biennial Meeting  
“Hires Imaging for the Hires Neurosurgeon”
- 2006 Visiting Professor, Vancouver General Hospital, BC Canada  
Grand Rounds for Neuroscience, “Hires Imaging for the Hires Neurosurgeon”  
Judge of Resident Research Day
- 2006 Optical Imaging 2006: Fifth Inter-Institute Workshop on Optical Diagnostic Imaging from  
Bench to Bedside at the National Institutes of Health  
“The Role of Quantitative Frequency Domain Near-Infrared Spectroscopy in the NICU”
- 2007 International Society for Magnetic Resonance in Medicine, 2007 Annual Meeting  
“DTI/fMRI in the Assessment of Brain Development.”
- 2007 Society for Pediatric Radiology, 2007 Annual Meeting  
“DTI: What has it taught us in Children?”
- 2007 American Society of Neuroradiology, 2007 Annual Meeting  
“Diffusion Weighted Imaging”
- 2008 International Epilepsy Colloquium Marburg 2008  
“Structural Imaging of MTS: Automated Volumetric Analysis and DTI”

- 2008 International Society for Magnetic Resonance in Medicine, 2008 Annual Meeting  
“The Challenge and Potential of DTI in the Developing Brain”
- 2008 Society for Pediatric Radiology, 2008 Annual Meeting  
“Applications of DTI in Pediatric Neuroradiology”
- 2008 American Epilepsy Society Annual Meeting, Merritt-Putnam Symposium  
“New Directions in Clinical Imaging of Cortical Dysplasias”
- 2008 Child Neurology, 2008 Annual Meeting  
“Brain Development Insights from Imaging”
- 2008 Children’s Hospital of Philadelphia Visiting Professorship
- 2009 Einstein University Visiting Professorship
- 2009 RSNA  
“Advances in Neonatal Imaging”
- 2010 NERRS  
“Imaging of Pediatric Epilepsy”
- 2010 Boston Neonatology Conference  
“State of the Art and Upcoming Advances in Neonatal Neuroimaging”
- 2010 Biomag  
“Development of the Cortex Determined with MRI/DTI/DSI of Fetal Specimens
- 2010 Martinos Center Radiology Conference  
“Neonatal Brain Injury”  
“Cerebral Malformations”
- 2010 SPR  
“Fetal MRI: Current Use, Challenges and Future Potential”  
“Perfusion ASL and NIRS in the Evaluation of Neonatal Brain Injury”
- 2010 JPR Radiology Conference  
“Perinatal Brain Injury in Preterm Infant”  
“Perinatal Brain Injury in Term Infant”  
“Clinical Application of ASL”  
“The Challenges and Potential of DTI in the Developing Brain”  
“Normal and Abnormal Brain Development: Insight from Imaging”  
“Fetal Neuroimaging”
- 2010 ISMRM  
“The Nascent Brain: Patterns and Mechanism of Brain Injury at Birth”
- 2010 ASNR  
“Seizure Disorder in Children”
- 2010 The Dyslexia Foundations 2010 Symposium
- 2010 XIX SYMPOSIUM NEURORADIOLOGICUM, The World Congress of Neuroradiology  
Bologna, Italy
- 2010 Harvard NIRS Course
- 2010 Lifelong Imaging Conference 2010, Tuebingen, Germany  
“MEG Development”
- 2010 RSNA  
“Advances in Neonatal Imaging”
- 2010 American Neurological Association  
“The Role of Connectivity in Epilepsy”

**Report of Clinical Activities and Innovations****Current Licensure and Certification**

<u>Year</u>	<u>Type of License or Certification</u>
1989	Medical College of Canada Qualifying Exams
1990	Member of the College of Physicians and Surgeons of British Columbia #12387
1994	Canadian Board of Radiology - Diagnostic Radiology Certificate
1994	American Board of Radiology - Diagnostic Radiology Certificate
1996	American Board of Radiology - CAQ in Neuroradiology
1996	Medical License California #A53248 (inactive)
1996	Medical License Ohio #71339
1998-	Medical License Massachusetts #157846

**Report of Scholarship**

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\*visiting foreign fellow supervised by Dr. Grant.
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27. Chang BS, Piao X, Giannini C, Cascino GD, Scheffer I, Woods CG, Topcu M, Tezcan K, Bodell A, Leventer RJ, Barkovich AJ, **Grant PE**, Walsh CA. Bilateral generalized polymicrogyria (BGP): a distinct syndrome of cortical malformation. *Neurology*. 2004 May 25;62(10):1722-8.
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### **EDITORIALS**

1. Lev MH, **Grant PE**. MEG versus BOLD MR imaging: functional imaging, the next generation? *AJNR Am J Neuroradiol*. 2000 Sep;21(8):1369-70.
2. Caviness VS, **Grant PE**: Our unborn children at risk? *Proc Natl Acad Sci U S A* 2006;103:12661.

### **CHAPTERS**

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2. Knake S, **Grant PE**. Magnetic Resonance Imaging Techniques in the Evaluation for Epilepsy Surgery. In Wylie E ed. *The Treatment of Epilepsy: Principles and Practice*. 4th Ed. In press.

### **BOOKS**

1. *Diagnostic Imaging: Pediatric Neuroradiology*. Eds AJ Barkovich, KR Moore, **PE Grant**, et al. Elsevier Health Services. 2007

### **Clinical Guidelines and Reports**

Ment LR, Bada HS, Barnes P, **Grant PE**, Hirtz D, Papile LA, Pinto-Martin J, Rivkin M, Slovis TL. Practice parameter: neuroimaging of the neonate: report of the Quality Standards Subcommittee of the American Academy of Neurology and the Practice Committee of the Child Neurology Society. *Neurology*. 2002 Jun 25;58(12):1726-38. Provides standard of care for neonatal imaging and is still active.