

## CURRICULUM VITAE

Date Prepared: 6/11/2018  
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### Education

Year	Degree (Honors)	Fields of Study (Thesis advisor for doctoral research degrees)	Institution
1976	A.B. (cum laude)	Biochemical Sciences	Harvard College
1980	M.D.	Medicine	Cornell University Medical College

### Postdoctoral Training

08/80-06/83	Resident	Diagnostic Radiology	University of California, San Diego Affiliated Hospitals
07/83-06/85	Fellow	Neuroradiology	Massachusetts General Hospital

### Faculty Academic Appointments

1985-1991	Assistant Professor of Radiology at the Hospital of the University of Pennsylvania	Radiology	University of Pennsylvania
1991-1996	Associate Professor of Radiology at the Hospital of the University of Pennsylvania	Radiology	University of Pennsylvania
1996-2003	Professor of Radiology- at the Hospital of the University of Pennsylvania	Radiology	University of Pennsylvania
2003-	Professor	Radiology	Harvard Medical School

### Appointments at Hospitals/Affiliated Institutions

7/1/2003-	Staff Radiologist	Radiology (Neuroradiology)	Beth Israel Deaconess Medical Center
-	Staff Radiologist	Radiology (Neuroradiology)	Needham Hospital
-	Staff Radiologist	Radiology (Neuroradiology)	Harrington Hospital
7/1/85-12/90	Staff Radiologist	Radiology (Neuroradiology)	Children's Hospital of Philadelphia
01/85-12/03	Staff Radiologist	Radiology (Neuroradiology)	Hospital of the University of Pennsylvania
01/85-12/03	Staff Radiologist	Radiology (Neuroradiology)	Veteran's Administration Hospital
01/88-12/94	Staff Radiologist	Radiology	Will's Eye Hospital

### Other Professional Positions

1993-	Consultant - Radiological Devices Panel and Medical Devices Advisory Committee	Center for Devices and Radiological Health, Food and Drug Administration
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### Major Administrative Leadership Positions

Local

Year(s)	Position Title	Institution (note if specific department)
2001-2003	Director, Mentoring Program Department of Radiology	Hospital of the University of Pennsylvania
2001-2003	Section Chief (Acting)	Hospital of the University of Pennsylvania
2003-2004	Faculty Council	Harvard Medical School
2003-	Chief of Neuroradiology Department of Radiology	Beth Israel Deaconess Medical Center
2003-	Assistant Dean for Faculty Development	Harvard Medical School
2017-	Radiology Vice Chair, Equity and Diversity	Beth Israel Deaconess Medical Center

### Committee Service

Local

Year(s) of Membership	Name of Committee	Institution/Organization
	Dates of Role(s)	Title of Role(s)
1989-1992	Drug Usage and Effects Committee	Hospital of the University of Pennsylvania
1993-1998, 2000-2003	University Council	University of Pennsylvania
	1993-1994 Personnel Benefits Committee	University of Pennsylvania
	1993-1995, Steering Committee	
	2000-2003	
	1994-1998 Chairman, Personnel Benefits Committee	

1993-1998	Faculty Senate Executive Committee	University of Pennsylvania
1994-1996	Oversight Committee, Student Judicial System Reform	University of Pennsylvania
1995-1996, 1997-1999, 2000-2001, 2002-2003	Faculty Senate	University of Pennsylvania
	1996-1997 Secretary	
	2000-2002 Committee on the Faculty	
	2000-2002 Committee on Students and Educational Policy	
	2000-2003 Committee on the Economic Status of the Faculty	
	2000-2001 Faculty Senate, Chair-Elect	
	2000-2003 Faculty Senate Executive Committee	
	2001-2002 Faculty Senate, Chair	
	2000-2003 Senate Committee on Administration	
	2002-2003 Faculty Senate, Past Chair	
1996-1998	Benefits Redesign Team	University of Pennsylvania
1997-1999	Medical School Teaching Evaluation Committee	University of Pennsylvania
1998-2003	Committee on Appointments & Promotions, Department of Radiology	University of Pennsylvania
2001-2003	Chair, Department of Radiology Committee on Appointments and Promotions	Hospital of the University of Pennsylvania
2002-2003	Committee on Appropriateness Criteria	University of Pennsylvania
2002-2003	Trustees' Budget & Finance Committee	University of Pennsylvania
2002-2003	Capital Council	University of Pennsylvania
2002-2003	Planning & Budget Committee	University of Pennsylvania
2003-	Chair, Faculty Development Committee, Department of Radiology	Beth Israel Deaconess Medical Center
2003-2004	Council of Deans & Administrative Directors	Harvard Medical School
2003-2004	Faculty Council Docket Committee	Harvard Medical School
2003-2004	Underrepresented Minority Faculty Subcommittee	Harvard Medical School
2003-2005	Medical Education Reform	Harvard Medical School
	2003-2004 Co-Chair, Faculty Development Working Group	
	2003-2005 Faculty Development Working group	
	2003-2005 Steering Committee	
2004-2005	Chair, Faculty Diversity Committee, Faculty Council	Harvard Medical School
2003-2007	Committee on Promotions and Reappointments	Harvard Medical School
2004-2006	Quality Assurance Committee, Interventional Neuroradiology	Beth Israel Deaconess Medical Center
2007-2010	Subcommittee of Professors	Harvard Medical School

2006-2012	Human Subjects Institutional Review Board	Harvard Medical School
2009-2011	Task Force on Faculty Diversity and Development (FDD)	Harvard Medical School
2009-2011	FDD Task Force, Chair Subcommittee on Searches and Expanding the Pool	Harvard Medical School
2011-2014	Subcommittee of Professors	Harvard Medical School
2016-	Committee on Senior Appointments (COSA)	Beth Israel Deaconess Med CTR
2017-	Task Force on Promotion Criteria, chair workgroup on new promotion pathway for teaching and educational leadership	Harvard Medical School
2017-	HMS Task Force on Diversity and Inclusion, Career Development and Retention of Diverse Faculty subcommittee, Harvard Medical School	
2017-	Institutional Self-Study (ISS) Task Force, ISS Faculty Subcommittee, Harvard Medical School	

#### National and International

1993-1997	Radiological Devices Panel, Medical Devices Advisory Committee	FDA Center for Devices & Radiological Health
1994	Trauma Task Force	National Institutes of Health
1997-1998	Human Resources of the Commission on Neuroradiology & Magnetic Resonance	American College of Radiology
2004-	External Advisory Board, Brain Tumor SPORE, Nelson P01	University of California, San Francisco
2005	Neuroradiology Appropriateness Criteria Panel	American College of Radiology
2007-	Academy of Radiology Research Board of Trustees	
2008	State Of the Art (SOTA) Conference "Approaches to Traumatic Brain Injury Screening, Treatment, Management, and Rehabilitation"	Veteran's Administration
2012	Neurology Steering Committee	National Quality Forum
2012	Safe Use of Medical Imaging	American Board of Radiology Foundation
2014-	Committee on Scientific Affairs	Radiological Society of North America
2016-2018	Neurology Steering Committee	National Quality Forum
2016-	Medical Imaging Drugs Advisory Committee (MIDAC)	Food and Drug Administration
2017-	National Advisory Neurological Disorders and Stroke (NANDS) Council- (ad hoc, 2017. Member, 2018)	National Institute of Neurological Diseases and Stroke

#### Professional Societies

1980-	American College of Radiology	Member
1981-	Radiological Society of North America	Member
1985-	American Society of Neuroradiology	Senior Member
1985 -	International Society of Magnetic Resonance in Medicine	Member

1985-2003	Pennsylvania Radiological Society	Member
1994-1998	American Society of Neuroradiology	Membership Committee, Member
	1996-1997	Chairman
1997-1998	American College of Radiology	Human Resources of the Commission on Neuroradiology & Magnetic Resonance, Member
1998-	American Board of Radiology	Examiner
1999-	Society for Neuroscience	Member
2001-2003	American Society of Neuroradiology	Nominating Committee, Member
	2002-2003	Chairman
2005-2007	American Society of Neuroradiology	Executive Committee
	2005-2007	Treasurer
2009-2012	American Society of Neuroradiology	Vice President, President-Elect, President
2009-2011	American Society of Neuroradiology	
	Program Committee	Member of each committee
	Research Committee	
	Nominating Committee	
	Financial Management Committee	
	Executive Committee	
	Administrative Committee	
2015-	Co-Chair, American Society of Neuroradiology, Financial Management Committee	
2009-2012	Radiological Society of North America	Annual Meeting Program Committee, Member
2009-2012	Radiological Society of North America	Neuroradiology Program subcommittee, Chair
2009-2012	International Society of Magnetic Resonance in Medicine	Annual Meeting Program Committee
2014-	Radiological Society of North America, Committee on Scientific Affairs	

### Grant Review Activities

(NIH unless otherwise specified)

### Regular Member

Code	Type		Type	Start	End
NS NST	IRG	NST-1 Subcommittee	REG	9/19/2008	6/30/2012
RGMEDI	IRG	Medical Imaging Study Section	REG	3/1/2004	6/30/2006
RGRNM	IRG	Diagnostic Radiology Study Section	REG	7/1/2002	4/30/2004
NS NST	IRG	Neurological Sciences Training	REG	7/1/1998	6/30/2002

### Ad Hoc

DOD, Spinal Cord Injury Research Program 1/23/2011-

Congressionally Directed Medical Research Programs		1/25/2011
FDA	Radiological Health Devices Panel	09/24/10
NCI-A RTRB-H (L1)	Subcommittee A-Cancer Centers, University of New Mexico Site Visit	2/24- 26/2010
ZNS1 SRB-M (74)	Pediatric Neurology Training Review	02/08/10
EHDA-LST	Department of Defense Spinal Cord Injury Research Program , Exploratory Hypothesis Development Application- Local and Systemic Therapeutics,	January 2010
EHDA-ROM	Department of Defense Spinal Cord Injury Research Program , Exploratory Hypothesis Development Application- Rehabilitation and Outcome Measures	January 2010
BOFZAP	University of Leuven (K.U.Leuven)	December 2009
RCOG	Research Grants Review, Research Advisory Committee, Wellbeing of Women	December 2009
ZNS1 SRB-S (21)	Career Development & Fellowship Application	11/4/2009
ZRG1 SBIB-V (52)	RFA-OD-09-003 Challenge Grant Panel 33	8/11/2009
ZRG1 SBIB-V (58)	RFA OD-09-003 Challenge Grant Panel 23	7/20/2009
ZCA1 SRLB-3 (01)	SBIR Phase II Bridge Awards to Accelerate the development of New Cancer Therapies and Cancer Imaging Technologies Toward Commercialization (SBIR [R44])	6/10/2009
NCI-A RTRB-H (E2)	Subcommittee A- Cancer Centers	2/18/2009
ZCA1 SRRB-3 (J1)	SBIR Phase II Bridge Awards to Accelerate the development of New Cancer Therapies and Cancer Imaging Technologies Toward Commercialization (SBIR [R44])	11/12/2008
NST-1	NST-1 Subcommittee	9/8/2008
NST	Neurological Sciences Training Initial Review Group	5/19/2008
ZCA1 SRRB-9 (J1)	In Vivo Cellular and Molecular Imaging Centers (ICMICs)	11/15/2007
ZCA1 SRRB-9 (Q1)	Triage Teleconference-In Vivo Cellular and Molecular Imaging Centers	11/1/2007
ZCA1 SRRB-9 (Q!)	In Vivo Cellular and Molecular Imaging Centers (ICMICs)	9/20/2007
NST	Neurological Sciences Training Initial Review Group	9/13/2007
NST	Neurological Sciences Training Initial Review Group	5/31/2007
ZRG1 MOSS-L (50)	PAR-04-077: Improving Functional	4/25/2007

	Outcomes	
NST	Neurological Sciences Training Initial Review Group	1/25/2007
ZCA1-SRRB-9 (A2)	Post Review Debriefing for PAR 06-406 ICMICS	11/28/2006
ZCA 1 SRRB-9 (J1)	PAR 06-406 "In Vivo Cellular and Molecular Imaging Centers (ICMICS)	11/14/2006
NCI-A RTRB-H (L2)	Subcommittee A-Cancer Centers	10/23/2006
ZCA1 SRRB-9 (A1)	Pre-Review Orientation for PAR 06-406, "In Vivo Cellular & Molecular Imaging Centers (ICMICA)"	9/27/2006
NST	Neurological Sciences Training Initial Review Group	9/21/2006
ZRG1 MOSS-L (50)	PAR-04-077: Improving Functional Outcomes	4/10/2006
NST	Neurological Sciences Training Initial Review Group	1/19/2006
ZRG1 MEDI-S (09)	MEDI Overflow Meeting	10/6/2005
NST	Neurological Sciences Training Initial Review Group	9/22/2005
ZRG1 MEDI-1 (09)	Overflow: Medical Imaging	8/3/2005
ZRG1 SBIB-D (02)	Member Conflict: Biomedical Imaging and Imaging Technology	6/7/2005
NCI-A RTRB-H (Y1)	Subcommittee A-Cancer Centers	1/18/2005
NST	Neurological Sciences Training Initial Review Group	10/13/2004
ZRG1 BDCN-F (11)	Medical Devices SBIR	6/22/2004
ZRG1 MEDI (91)	ZRG1 MEDI 91S: Medical Imaging; Neuroradiology	6/22/2004
ZNS1 SRB-R (06)	Spinal Injury RFA	4/2/2004
ZRG1 DMG (01)	ZRGI-DMG (01) Diagnostic Radiology Member Conflict Meeting	10/7/2002
ZNS1 SRB-S (02)	LOAN REPAYMENT Special Emphasis Panel	5/10/2002
RNM	Diagnostic Radiology Study Section	2/21/2002
ZRG1 DMG (33)	Center for Scientific Review Special Emphasis Panel	2/20/2002
ZNS1 SRB-S (2)	NINDS Special Emphasis Panel	11/27/2001
RNM	Diagnostic Radiology Study Section	10/9/2001
ZNS1 SRB-L (01)	NINDS Special Emphasis Panel	7/17/2001
RNM	Diagnostic Radiology Study Section	1/15/2001
ZRG1 DMG (33)	Center for Scientific Review SEP	1/14/2001
ZNS1 SRB-S (02)	NINDS SEP	12/11/2000
NST	Neurological Sciences Training Initial Review Group	6/9/2000
ZRG1 SRB (2)	Center for Scientific Review SEP	3/17/2000
ZNS1 SRB-L (01)	NINDS Special Emphasis Panel	12/2/1999
ZRG1 SSS-7 (80)	Center for Scientific Review SEP	11/10/1999
NST	Neurological Sciences Training Initial Review Group	10/21/1999

NST	Neurological Sciences Training Initial Review Group	6/19/1998
NST	Neurological Sciences Training Initial Review Group	2/20/1998
NST	Neurological Sciences Training Initial Review Group	10/23/1997
ZHL1	NHLBI	7/7/1992

### Editorial Activities

#### Ad Hoc Reviewer

1986 -	Radiology
1987-	American Journal of Neuroradiology
1987-	Annals of Neurology
1991-	Magnetic Resonance in Medicine
1997-	Academic Radiology
1998-	New England Journal of Medicine
1998-	American Journal of Roentgen ology
2000-	Journal of Neuroscience Methods
2007-	Neuroimage
2007-	Journal of Neurology, Neurosurgery and Psychiatry

#### Other Editorial Roles

1988	Abstract Reviewer	Society of Magnetic Resonance in Medicine
1990-	Editorial Board Member	American Journal of Neuroradiology
1991-1995	Associate Editor	Radiology
1992	Issue Editor	Topics in Magnetic Resonance Imaging
1996-	Consultant to the Editor	Radiology

### Honors and Prizes

1999	Fellow	American College of Radiology
2003	Fellow	International Society of Magnetic Resonance in Medicine`

## Report of Funded and Unfunded Projects

### Funding Information

Past

Year(s)	Grant title Grant type and number Role on Project (if PI or site PI, total indirect costs) Description of the major goals
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1987-1989	Other, #87-94, American Cancer Society Clinical Oncology Career Development P.I. (\$__)
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1988-1993 Major Goal:  
Magnetic Resonance of Spinal Cord Injury  
N.I.H.-NINDS,  
R01 NS 25921-01 RNM R  
P.I. (\$\_\_)

1995-1997 Major Goal:  
James A. Shannon Director's Award, Magnetic Resonance of Spinal Cord Injury  
N.I.H.-NINDS-R01 NS 25921-06A1  
P.I. (\$\_\_)

1995-1998 Major Goal:  
A Phase I Trial of HSVTK Gene Therapy for CNS Tumors  
N.I.H.-NCI, 1 R01-CA67790-02  
Co-P.I. (\$\_\_)

1996-1999 Major Goal:  
Magnetic Resonance of Spinal Cord Injury  
N.I.H.-NINDS, 2 R01-NS 5921-06A2 1996-99  
P.I. (\$\_\_)

2001-2003 Major Goal:  
R21-Ca93007-02 [Sydney Evans]1/1/2001-12/31/2003  
N.I.H.-NCI  
Assessment of Hypoxia in Malignant Gliomas Using EF5.  
The overall goal of the clinical program is to determine whether the presence, levels and patterns of EF5 binding are important in the prognosis and therapy response of cancer patients.

2002-2004 R21-NS04418901 [Gee]1/1/2002-12/31/2004  
NINDS  
Registration Methods for Diffusion Tensor MRI Studies of Spinal Cord Injury.  
To develop a method of non-rigid registration and spatial normalization of DT-MR images.  
Role: Co I

2002-2005 Object Definition in Tomographic Radiology  
N.I.H.-NINDS, R01-NS37172-03A2  
P.I. Udupa  
Major Goal: To develop theories, algorithms and heir practical computer implementations to identify and quantify object information captured in multidimensional medical images.

2001-2006 R01 NS41380-01 [Hackney]1/1/01-12/31/06  
NINDS  
Magnetic Resonance Imaging of Post Traumatic Axonal Degeneration and Regeneration.  
This study uses magnetic resonance diffusion imaging to characterize axonal degeneration and regeneration in response to spinal cord injury.  
Role: PI

Current

Year(s)	Grant title Grant type and number Role on Project (if PI or site PI, total indirect costs) Description of the major goals
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2006-11

Current

1 R01 CA115745-01A1 [Alsop]7/1/2006-6/30/2011  
N.I.H.-NINDS

Title: "Blood Flow MRI for monitoring Glioma Angiogenesis"

The aims of this project are to measure blood flow and its reproducibility in glioma with MRI methods, to correlate blood flow with markers of angiogenic activity and with magnetic resonance spectroscopy measures, and to determine the blood flow characteristics of tumor recurrence following therapy. 0.6 calendar months

Role: Co-P.I.

2010--13

SCIRP 090251 role:PI

DOD Spinal Cord Injury Research Program

(SCIRP) Translational Research Partnership Award

Magnetic Resonance Characterization of Axonal Response to Spinal Cord

Injury \$750,000 direct costs

This study uses diffusion, myelin imaging, and magnetization transfer techniques to assess the severity of axonal and myelin loss after spinal cord injury.

Year(s) funded	Role on Project/ Title of Project One sentence description of the purpose of the project
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## Report of Local Teaching and Training

### Formally Supervised Trainees

Year(s)	
1985-1987	Scott Atlas, MD/Professor
1985-1987	Michael Phillips, MD/Vice Chairman of Research and Academic Affairs, Imaging Institute, Cleveland Clinic
1985-1987	Jeffrey Jarvik, MD/ Professor, University of Washington
1985-1987	Jeffrey Petrella, MD/Associate Professor
1985-1987	David Yousem, MD/Professor
1998-2000	Gul Moonis, MD/Assistant Professor
1999-2002	Eric Schwartz, MD/Associate Professor
2001-	Chih Liang Chin/Other
2001-2002	Hardave Kharbanda/Post Doctoral fellow
2001-2001	Masaya Takahashi, PhD/Assistant Professor

2002-	Andra Popescu/Other
2005-5	
2005-6	Carlos Cunha, MD/ Assistant professor
2006-7	Nagamani Peri,MD/ Instructor
2007-8	Juan Ortega, MD/Assistant Professor
2008-9	Alice Fisher, MD/Instructor
2008-9	Harprit Bedi, MD/Assistant Professor
2009-10	Neel Madan, MD/Assistant Professor

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

### Invited Presentations and Courses

Year(s)	f presentation or name of course/ Type of presentation/role(s) (note if presentation the result of a selected abstract) Location (Sponsor, if any)
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#### National

No presentations below were sponsored by outside entities. Or Those presentations below sponsored by outside entities are so noted and the sponsor identified.

Year(s)	f presentation or name of course/ Type of presentation/role(s) (note if presentation the result of a selected abstract) Location (Sponsor, if any)
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2008	State of the Art (SOTA) Conference: Approaches to Traumatic Brain Injury Screening, Treatment, Management, and Rehabilitation, Arlington, VA, Veteran's Administration/ <i>Invited participant</i>
2010	Advanced Imaging of Degenerative Disk Disease, Radiological Society of North America, Chicago, IL
2011	Imaging of Spinal Injury. 49 <sup>th</sup> Annual Meeting, American Society of Neuroradiology, Seattle, WA, June, 2011
2011	Getting Promoted. 49 <sup>th</sup> Annual Meeting, American Society of Neuroradiology, Seattle, WA, June, 2011
2011	Imaging of Spinal Cord Injury, Eastern Neuroradiology Society, Chatham, MA
2011	Advanced Imaging of Degenerative Disk Disease, Western Neuroradiology Society, Rancho Mirage, CA
2011	American Society of Neuroradiology Presidential Address, Western Neuroradiology Society, Rancho Mirage, CA
2011	Advanced Imaging of Degenerative Disk Disease, Advanced Imaging of Degenerative Disk Disease, 50 <sup>th</sup> Annual Meeting of the American Society of Neuroradiology, New York, April 2012.
2012	Presidential Address, 50 <sup>th</sup> Annual Meeting of the American Society of Neuroradiology,

	New York, April 2012.
2012	The Big Questions, and How Imaging Can Help”, International Society of Magnetic Resonance in Medicine, Workshop on Advanced Brain Imaging, McLean, Virginia, September 2012
2013	Panel session “Revenge” International Society of Magnetic Resonance in Medicine, Salt Lake City, UT 2013
2013	Advanced imaging of Intervertebral Disk, American Society of Neuroradiology, San Diego, CA, May, 2013
2013	Future of Neuroradiology, American Society of Neuroradiology, San Diego, CA, May, 2013
2014	Emergency Spine Imaging, American Society of Spine Radiology, Miami Beach, FL, February, 2014
2014	K Awards, A Reviewer’s Perspective, NINDS Grant Writing Workshop for Diverse Researchers, Bethesda, MD, July, 2014
2014	Juan M. Taveras Annual Lecture. Ligamentous Disease, Massachusetts General Hospital Postgraduate Course, Neuroradiology, Cambridge, MA, September 2014
2016	Radiologic Predictions of Fracture Risk in Spinal Metastatic Disease, 31 <sup>st</sup> Annual Meeting, North American Spine Society, Boston, October 2016
2017	“Methodology of Metrics Review and Endorsement Criteria” Evidence Based Medicine Program, 55 <sup>th</sup> Annual Meeting, American Society of Neuroradiology, Long Beach, CA, April, 2017

International

No presentations below were sponsored by outside entities

Year(s)	presentation or name of course/ Type of presentation/role(s) (note if presentation the result of a selected abstract) Location (Sponsor, if any)
2008	"Diffusion imaging of the spinal cord". At “ <b>Methods and Applications of Diffusion Tensor and Functional Magnetic Resonance Imaging</b> ”, Umea University, Umeå, Sweden, October, 2008.
2014	The Role of Imaging in Management of Acute Stroke. <b>14th Advanced Neuroradiology Course, National Neurological Institute</b> , Singapore, October 2014
2014	Advanced MR Imaging of the Intervertebral Disk. <b>14th Advanced Neuroradiology Course, National Neurological Institute</b> , Singapore, October 2014
2014	Evaluation of Traumatic Spinal Ligamentous Injury. <b>14th Advanced Neuroradiology Course, National Neurological Institute</b> , Singapore, October 2014
2014	Diffusion Imaging of the Spinal Cord. <b>14th Advanced Neuroradiology Course, National</b>

## Report of Clinical Activities and Innovations

### Current Licensure and Certification

Year	Type of License or Certification
1981	California Medical License
1984	American Board of Radiology, Certification
1985	Pennsylvania Medical License
1993	New Jersey Medical License
1995	CAQ in Neuroradiology
1996	Ohio Medical License
2003	Massachusetts Medical License
2005	Subspecialty Certification in Neuroradiology, renewed

### Practice Activities

List all clinical activities, both those at Harvard and its affiliates and those outside Harvard, and for each indicate:

Year(s)	Type of activity	Name and location of practice	Level of activity
2003-present	Neuroradiology	Department of Radiology Beth Israel Deaconess Medical Center, Boston, MA	3 1/2 days/week

### Recognition

Year(s)	Name of award/recognition	Organization conferring recognition
2001- present	Best Doctor in America	
2006-present	"Top Docs" Boston Magazine	
2006-present	"America's Top Doctors"	
2011-present	USNews Top Doctor	

## Report of Scholarship

Peer-Reviewed Publications in Print or Other Media

### Research Investigations

Peck WW, Slutsky RA, **Hackney DB**, Mancini GB, Higgins CB. Effects of contrast media on pulmonary hemodynamics: comparison of ionic and non-ionic agents. Radiology. 1983;149(2):371-4.

Slutsky RA, **Hackney DB**, Peck WW, Higgins CB. Extravascular lung water: effects of ionic and nonionic contrast media. Radiology. 1983;149(2):375-8.

**Hackney D**, Slutsky RA, Mattrey R, Peck WW, Abraham JL, Shabetai R, Higgins

- CB. Experimental pericardial inflammation evaluated by computed tomography. *Radiology*. 1984;151(1):145-8.
- Mattrey RF, Andrè M, Campbell J, Mitten R, Multer F, **Hackney D**, Long DM, Higgins CB. Specific enhancement of intra-abdominal abscesses with perfluorocetyl bromide for CT imaging. *Invest Radiol*. 1984;19(5):438-46.
- Centeno RS, **Hackney DB**, Rothrock JR. Streptokinase clot lysis in acute occlusions of the cranial circulation: study in rabbits. *AJNR Am J Neuroradiol*. 1985;6(4):589-94.
- Goldberg HI, Spagnoli MV, Grossman RI, **Hackney DB**, Zimmerman RA, Bilaniuk LT. High field magnetic resonance evaluation of acoustic neurinomas. *Acta Radiol Suppl*. 1986;369:173-5.
- Grossman RI, Gomori JM, Goldberg HI, **Hackney DB**, Macchi PJ, Hecht-Leavitt C, Zimmerman RA, Bilaniuk LT. Magnetic resonance imaging of hemorrhagic conditions. *Acta Radiol Suppl*. 1986;369:53-5.
- Zimmerman RA, Atlas S, Bilaniuk LT, **Hackney DB**, Goldberg HI, Grossman RI. Magnetic resonance imaging of cerebral aneurysm. *Acta Radiol Suppl*. 1986;369:107-9.
- Zimmerman RA, Bilaniuk LT, **Hackney DB**, Goldberg HI, Grossman RI. Magnetic resonance imaging of the pediatric spinal cord and canal. *Acta Radiol Suppl*. 1986;369:649-50.
- Zimmerman RA, Bilaniuk LT, **Hackney DB**, Goldberg HI, Grossman RI. Magnetic resonance imaging of dural venous sinus invasion, occlusion and thrombosis. *Acta Radiol Suppl*. 1986;369:110-2.
- Zimmerman RA, Bilaniuk LT, **Hackney DB**, Goldberg HI, Grossman RI. Magnetic resonance imaging of traumatic sinus and mastoid bleeding. *Acta Radiol Suppl*. 1986;369:367-9.
- Gomori JM, Grossman RI, Goldberg HI, **Hackney DB**, Zimmerman RA, Bilaniuk LT. Occult cerebral vascular malformations: high-field MR imaging. *Radiology*. 1986;158(3):707-13.
- Hackney DB**, Grossman RI, Zimmerman RA, Joseph PM, Goldberg HI, Bilaniuk LT. MR characteristics of iophendylate (Pantopaque). *J Comput Assist Tomogr*. 1986;10(3):401-3.
- Centeno RS, Sovak M, **Hackney DB**, Garfin SR. Brain changes on computed tomography following metrizamide myelography. Significance and therapeutic implications. *Spine*. 1986;11(6):509-12.
- Atlas SW, Zimmerman RA, Bilaniuk LT, Rorke L, **Hackney DB**, Goldberg HI, Grossman RI. Corpus callosum and limbic system: neuroanatomic MR evaluation of developmental anomalies. *Radiology*. 1986;160(2):355-62.
- Hecht-Leavitt C, Gomori JM, Grossman RI, Goldberg HI, **Hackney DB**, Zimmerman RA, Bilaniuk LT. High-field MRI of hemorrhagic cortical infarction. *AJNR Am J Neuroradiol*. 1986;7(4):581-5.
- Hackney DB**. Prolactinomas after bromocriptine therapy. *AJNR Am J Neuroradiol*. 1986;7(4):738-9.
- Atlas SW, Grossman RI, Goldberg HI, **Hackney DB**, Bilaniuk LT, Zimmerman RA. MR diagnosis of acute disseminated encephalomyelitis. *J Comput Assist*

Tomogr. 1986;10(5):798-801.

- Hackney DB**, Lesnick JE, Zimmerman RA, Grossman RI, Goldberg HI, Bilaniuk LT. MR identification of bleeding site in subarachnoid hemorrhage with multiple intracranial aneurysms. *J Comput Assist Tomogr.* 1986;10(5):878-80.
- Hackney DB**, Asato R, Joseph PM, Carvlin MJ, McGrath JT, Grossman RI, Kassab EA, DeSimone D. Hemorrhage and edema in acute spinal cord compression: demonstration by MR imaging. *Radiology.* 1986;161(2):387-90.
- Spagnoli MV, Goldberg HI, Grossman RI, Bilaniuk LT, Gomori JM, **Hackney DB**, Zimmerman RA. Intracranial meningiomas: high-field MR imaging. *Radiology.* 1986;161(2):369-75.
- Zimmerman RA, Bilaniuk LT, **Hackney DB**, Goldberg HI, Grossman RI. Head injury: early results of comparing CT and high-field MR. *AJR Am J Roentgenol.* 1986;147(6):1215-22.
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American College of Radiology Appropriateness Criteria: Spinal Trauma, 2008



## Narrative Report

My research has focused on imaging of the spine and spinal cord. I have long studied MR imaging of spinal cord injury. We initially demonstrated MR/pathologic correlation in an animal model of cord trauma defining the relationship between hemorrhage and edema at histologic inspection and MR imaging. We have extended these studies to determine the associations between the extent of MR abnormalities, the severity of mechanical injury and functional outcomes. We demonstrated that linear measures of injury size on MR images predicted the drop height in weight drop injuries. We established that diffusion imaging of the cord could contribute to understanding the nature and severity of the injury. Since that time, our work has focused on defining the information to be obtained from diffusion studies of cord trauma. We have followed with investigations of the role of the axonal membrane and myelin sheath in determining diffusion coefficients, measurements of pure intra-axonal diffusion coefficients in the larval sea lamprey, as well studies in the effect of neurotropic factors in recovery from injury and the resulting changes in diffusion characteristics in rats. An extension of this work included studies of the source of multiexponential diffusion behavior in white matter and a novel approach to simulating the MR diffusion experiment on light microscopic images of nervous tissue. This work confirmed that multiexponential fits of diffusion data do not reproduce the proportions of intracellular or extracellular fluid or their diffusion coefficients. We have related the MR diffusion findings to the severity of axonal loss and abnormal post traumatic distribution of axonal diameters. We demonstrated a method for direct imaging of spinal cord myelin content, rather than the inferred concentration based on water T2 measures. These studies have formed much of the foundation upon which interpretation of MR studies of spinal cord injury are based. More recently my focus has shifted to predicting spinal mechanics using noninvasive imaging. With CT we have demonstrated robust prediction of vertebral body failure load in bodies containing simulated lytic metastases. This is in support of a broader effort to predict the risk of pathologic fractures in patients with spinal metastases. We have used MR imaging to predict the mechanical properties of intervertebral disks. This work seeks to elucidate the role of aberrant mechanics on the evolution of degenerative disk disease. We have shown, at the proof of principle level, that we can use diffusion tensor imaging to characterize the annulus fibrosus and estimates of hydration and apparent diffusion coefficient to characterize the nucleus pulposus. Together, these methods provide input data for successful finite element modeling of the disk. We plan to extend this work in a cross sectional study of cadaver disks and refine the approach to permit in vivo assessment of spinal mechanical responses to loading. Thus, we will be able to predict pathologic fracture risk in patients with metastases and to predict spinal mechanical performance in patients with degenerative disk disease. Throughout my career, I have taught medical students, radiology residents, and neuroradiology fellows. I have collaborated with and mentored junior faculty. I have supervised a small number of graduate students and postdoctoral fellows. As a neuroradiologist, my clinical responsibilities include performance and interpretation of magnetic resonance studies, computed tomography, myelography, and angiography of the central nervous system, head, neck, and a particular emphasis on the spine.

Abstracts Presented

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