

Department of Radiology

Annual Executive Summary Report

July 1, 2012 to June 30, 2013

Vijay M. Rao, MD
The David C. Levin Professor and Chair

DEPARTMENT OF RADIOLOGY

Jefferson Medical College
Thomas Jefferson University
Jefferson University Hospitals

The Mission of the Department of Radiology
is to provide quality diagnostic and
therapeutic imaging services and to
continually improve our services.

Our goals are to:

- Provide quality service to patients and referring physicians
 - Continue to grow successfully in an increasingly competitive market and be the leader
 - Operate in an efficient, productive, and cost effective manner
 - Maintain excellence of our educational programs
 - Continue to advance the science of translational and clinical imaging research
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DEPARTMENT OF RADIOLOGY

Vijay M. Rao, M.D.

Professor and Chairman

Adam E. Flanders, M.D.	Vice Chair for Informatics
Ethan J. Halpern, M.D.	Vice Chair for Research
Christopher R.B. Merritt, M.D.	Vice Chair for QA & Performance Improvement
Levon N. Nazarian, M.D.	Vice Chair for Education
Christopher G. Roth, M.D.	Vice Chair for Methodist Radiology
Adam C. Zoga, M.D.	Vice Chair for Clinical Practice

2012-2013

DEPARTMENT CLINICAL DIVISIONS AND DIRECTORS

BODY COMPUTED TOMOGRAPHY/ABDOMINAL IMAGING	Laurence Needleman, M.D.
BREAST IMAGING	Barbara C. Cavanaugh, M.D.
CARDIOTHORACIC RADIOLOGY	Achala Donuru, M.D. (<i>Acting</i>)
INTERVENTIONAL RADIOLOGY	Daniel B. Brown, M.D.
MAGNETIC RESONANCE IMAGING	Donald G. Mitchell, M.D.
METHODIST RADIOLOGY	Christopher G. Roth, M.D.
MUSCULOSKELETAL AND GENERAL DIAGNOSTIC RADIOLOGY	William B. Morrison, M.D.
NEURORADIOLOGY/ENT RADIOLOGY	Adam E. Flanders, M.D. David P. Friedman, M.D.
NUCLEAR MEDICINE	Charles M. Intenzo, M.D.
ULTRASOUND	Barry B. Goldberg, M.D.

DEPARTMENTAL COMMITTEES AND CHAIRS

ADVISORY COMMITTEE	Sandeep P. Deshmukh, M.D.
CONTRAST COMMITTEE	Laurence Needleman, M.D.
DIVISION DIRECTORS COMMITTEE	Vijay M. Rao, M.D.
EDUCATION COMMITTEE	Levon N. Nazarian, M.D.
INFORMATICS STEERING COMMITTEE	Victor Sarro
PERFORMANCE IMPROVEMENT COMMITTEE	Christopher R.B. Merritt, M.D.
RESEARCH COMMITTEE	Barry B. Goldberg, M.D. Ethan J. Halpern, M.D.
RESIDENCY SELECTION COMMITTEE	Sandeep P. Deshmukh, M.D.

**RADIOLOGY DEPARTMENT FACULTY RANK
2012-2013**

PROFESSORS

Oksana H. Baltarowich, M.D.
Daniel B. Brown, M.D.
Rick I. Feld, M.D.
Adam E. Flanders, M.D.
Flemming Forsberg, Ph.D.
Geoffrey A. Gardiner, Jr., M.D.
Barry B. Goldberg, M.D.
Ethan J. Halpern, M.D., M.S.C.E.
Charles M. Intenzo, M.D.
David Karasick, M.D.
Stephen Karasick, M.D.
Alfred B. Kurtz, M.D.
Christopher R.B. Merritt, M.D.
Donald G. Mitchell, M.D.
William B. Morrison, M.D.
Levon N. Nazarian, M.D.
Andrew B. Newberg, M.D.
Vijay M. Rao, M.D.
Mathew L. Thakur, Ph.D.

RESEARCH PROFESSOR

Ji-Bin Liu, M.D.

EMERITUS PROFESSOR

David C. Levin, M.D.

ASSOCIATE PROFESSORS

David J. Eschelman, M.D.
David P. Friedman, M.D.
Carin F. Gonsalves, M.D.
Sung M. Kim, M.D.
Laurence Needleman, M.D.
Patrick L. O’Kane, M.D.
Christopher G. Roth, M.D.
Lisa M. Tartaglino, M.D.
Adam C. Zoga, M.D.

**CLINICAL ASSOCIATE
PROFESSOR**

Barbara C. Cavanaugh, M.D.
Sandeep P. Deshmukh, M.D.
Eric L. Gingold, Ph.D.

ASSISTANT PROFESSORS

Diane M. Deely, M.D.
Steven G. Finden, D.D.S., M.D.
Angela G. Gopez, M.D.
Richard J. Gorniak, M.D.
Paras Lakhani, M.D.
Andrej Lyshchik, M.D., Ph.D.
Sharon R. Segal, D.O.
Alexander B. Sevrukov, M.D.
Dinesh K. Sharma, M.D.
Colette M. Shaw, M.D.
Kiran Talekar, M.D.
Annina N. Wilkes, M.D.

**CLINICAL ASSISTANT
PROFESSORS**

Mark W. Cooper, M.D.
Flavius F. Guglielmo, M.D.
George Paul Hobbs, M.D.
Elizabeth H. Hsu, M.D.
Cindy Isaacson-Finden, M.D.
Suzanne S. Long, M.D.
Kristen McClure, M.D.
Cynthia L. Miller, M.D.
Neeta Rao, M.D.
Paul Read, M.D.
Lillian H. Stern, M.D.
Terri Tuckman, M.D.
Nylah Fatima Wasti, M.D.
Michael Wolf, M.D.

**RESEARCH ASSISTANT
PROFESSOR**

Laurence Parker, Ph.D.

INSTRUCTORS

Mark D. Allan, M.D.
Susan DeWyngaert, M.D.
Achala Donuru, M.D.
Tara Eisenberg, M.D.
Manoharan Muthuvelu, M.D.

FACULTY WITH SECONDARY APPOINTMENTS IN RADIOLOGY

Demetrius H. Bagley, M.D., Professor of Urology [primary]
Associate Professor of Radiology [secondary]

Robert L. Brent, M.D., Ph.D., Professor of Pediatrics [primary]
Professor of Radiology [secondary]

Paul J. DiMuzio, M.D., Assistant Professor of Surgery [primary]
Assistant Professor of Radiology [secondary]

Christopher L. Hansen, M.D., Professor of Medicine [primary]
Professor of Radiology [secondary]

Robert H. Rosenwasser, M.D., Professor of Neurosurgery [primary]
Professor of Radiology [secondary]

Stanton N. Smullens, M.D., Professor of Surgery [primary]
Associate Professor of Radiology [secondary]

Joseph A. Tracy, Ph.D., Professor of Neurology [primary]
Professor of Radiology [secondary]

Paul Walinsky, M.D., Professor of Medicine [primary]
Assistant Professor of Radiology [secondary]

DEPARTMENT OF RADIOLOGY

Vijay M. Rao, M.D., Chairman

CLINICAL DIVISIONS 2012-2013

Body Computed Tomography/ Abdominal Imaging	Directed by Laurence Needleman, M.D. Drs. Oksana Baltarowich, Sandeep Deshmukh, Tara Eisenberg, Rick Feld, Flavius Guglielmo, Ethan Halpern, Stephen Karasick, Alfred Kurtz, Andrej Lyshchik, Donald Mitchell, Levon Nazarian, Patrick O’Kane
Breast Imaging	Directed by Barbara C. Cavanaugh, M.D. Drs. Susan DeWyngaert, Tara Eisenberg, Cindy Finden, Elizabeth Hsu, Alexander Sevruckov, Nylah Wasti, Annina Wilkes
Cardiothoracic Radiology	Directed by Achala Donuru, M.D. Drs. Cindy Finden, Ethan Halpern, David Karasick, Stephen Karasick, Paras Lakhani, Manoharan Muthuvelu, Dinesh Sharma, Nylah Wasti
Interventional Radiology	Directed by Daniel B. Brown, M.D. Drs. David Eschelman, Geoffrey Gardiner, Jr., Carin Gonsalves, Colette Shaw
Magnetic Resonance Imaging	Directed by Donald G. Mitchell, M.D. Drs. Sandeep Deshmukh, Flavius Guglielmo, Patrick O’Kane
Methodist Radiology	Directed by Christopher G. Roth, M.D. Drs. Mark Allan, Mark Cooper, G. Paul Hobbs, Paras Lakhani, Kristen McClure, Cynthia Miller, Paul Read, Alexander Sevruckov, Lillian Stern
Musculoskeletal and General Diagnostic Radiology	Directed by William B. Morrison, M.D. Drs. Diane Deely, Achala Donuru, Cindy Finden, Angela Gopez, David Karasick, Stephen Karasick, Paras Lakhani, Suzanne Long, Manoharan Muthuvelu, Paul Read, Dinesh Sharma, Adam Zoga
Neuroradiology/ENT Radiology	Directed by Adam E. Flanders, M.D., David P. Friedman, M.D. Drs. Steve Finden, Richard Gorniak, Neeta Rao, Vijay Rao, Dinesh Sharma, Lisa Tartaglino, Michael Wolf
Nuclear Medicine	Directed by Charles M. Intenzo, M.D. Drs. Sung Kim, Paras Lakhani, Andrew Newberg
Ultrasound	Directed by Barry B. Goldberg, M.D. Drs. Oksana Baltarowich, Sandeep Deshmukh, Rick Feld, Flavius Guglielmo, Ethan Halpern, Alfred Kurtz, Suzanne Long, Chris Merritt, Levon Nazarian, Laurence Needleman, Patrick O’Kane, Sharon Segal, Terri Tuckman, Annina Wilkes
Research	Drs. Flemming Forsberg, Ji-Bin Liu, Laurence Parker, Mathew Thakur

DEPARTMENT OF RADIOLOGY
HOUSESTAFF ROSTER
2012-2013

RESIDENTS

FIRST YEAR RESIDENTS (PGY-2)

David Becker-Weidman, M.D.
Jordan Gold, M.D.
Ian Hayden, M.D.
Robert Layser, M.D.
Neil Malhorta, M.D.
Lauren Goldlust Okon, M.D.
Kevin Pan, M.D.
Anuj Patel, M.D.
Allison Tan, M.D. (pathway PGY-3)

SECOND YEAR RESIDENTS (PGY-3)

Sudheer Balakrishnan, M.D.
Noam Belkind, M.D.
Travis Gehringer, M.D.
Robert Kurtz, M.D.
Praneil Patel, M.D.
Sandra Rutigliano, M.D.
Kathleen Schenker, M.D.
Shrenik Shah, M.D. (pathway PGY-4)
Amelia Wnorowski, M.D.
Zombor Zoltani, M.D.

THIRD YEAR RESIDENTS (PGY-4)

Niraj Bhalakia, M.D.
Andrew Chi, M.D.
Christopher Gutjahr, M.D. (pathway PGY-5)
Hassan Irshad, M.D.
Arvin Kheterpal, M.D.
Matthew Morgan, M.D.
Ilana Neuberger, M.D.
Lodewijk van Holsbeeck, M.D.

FOURTH YEAR RESIDENTS (PGY-5)

Allison Borowski, M.D.
Laryssa Hud, M.D.
Ryan Huffman, M.D.
Nicholas Petruzzi, M.D.
Jason Redon, M.D.
Scott Sequeira, M.D. (pathway PGY-6)
Richard Sharpe, M.D.
Bartley Thornburg, M.D.
Rebecca Winter, M.D.
Vahe Zohrabian, M.D.

Nuclear Medicine

Chaitra Channappa, M.D. (PGY-4)
Ameneh Mashayekh, M.D (PGY-3)

FELLOWS

ABDOMINAL IMAGING (PGY-6)

Aaron Burns, M.D.
Jehad Fataftah, M.D.
Peter Ghobrial, M.D.
Cyrus Michael Golsaz, M.D.
Bhishak Kamat, M.D.
Arash Radparvar, M.D.

BODY MRI (PGY-6)

Hugh Daniel White, II, M.D.

BREAST IMAGING (PGY-6)

Courtney Hoey Schlenker, M.D.

MUSCULOSKELETAL IMAGING (PGY-6)

Waseem Khan, M.D.
Andrew Palisch, M.D.
Pranshu Sharma, M.D.

**VASCULAR/INTERVENTIONAL
RADIOLOGY (PGY-6)**

Anton Mahne, M.D. (through 08/31/12)
Andrew Maleson, M.D.
Michael Petroziello, M.D.
Mark Werley, M.D.

**MUSCULOSKELETAL/NEURO MRI
(PGY-6)**

Luke Maj, M.D.
Ariel Prager, M.D.
Michael Scanlan, M.D.

NEURO/ENT RADIOLOGY (PGY-6)

Ashish Gandhe, M.D. (PGY-7)
Jawaad Mohammed Mohiuddin, M.D.
Falguni Satish Patel, D.O.
Raj Patel, M.D.

Department of Radiology (2012-2013)

Chairman
V. Rao, MD

Administrator
V. Sarro

Administrative Assistant
J. Gardner

**Vice Chair,
Informatics**
A. Flanders, MD

**Vice Chair,
Education**
L. Nazarian, MD

**Vice Chair,
Methodist Radiology**
C. Roth, MD

**Vice Chair,
Research**
E. Halpern, MD

**Vice Chair,
QA & Performance Improvement**
C. Merritt, MD

**Vice Chair,
Clinical Practice**
A. Zoga, MD

CLINICAL DIVISIONS

RESEARCH

Body CT/
Abdominal
Imaging

L. Needleman,
MD

Breast
Imaging

B. Cavanaugh,
MD

Cardio-
Thoracic
Radiology

A. Donuru,
MD

Interventional
Radiology

D. Brown,
MD

Magnetic
Resonance
Imaging

D. Mitchell,
MD

Methodist
Radiology

C. Roth,
MD

Musculoskeletal
and General
Diagnostic
Radiology

W. Morrison,
MD

Neuro/ENT
Radiology

A. Flanders,
MD
D. Friedman,
MD

Nuclear
Medicine

C. Intenzo,
MD

Ultrasound

B. Goldberg,
MD

Biomedical Imaging
Research

F. Forsberg, PhD
E. Gingold, PhD
J.B. Liu, MD
M. Thakur, PhD

Health
Services
Research

L. Parker,
PhD

COMMITTEES

ADVISORY

S. Deshmukh, MD

CONTRAST

L. Needleman, MD

DIVISION
DIRECTORS

V. Rao, MD

EDUCATION

L. Nazarian, MD

INFORMATICS
STEERING

V. Sarro

PERFORMANCE
IMPROVEMENT

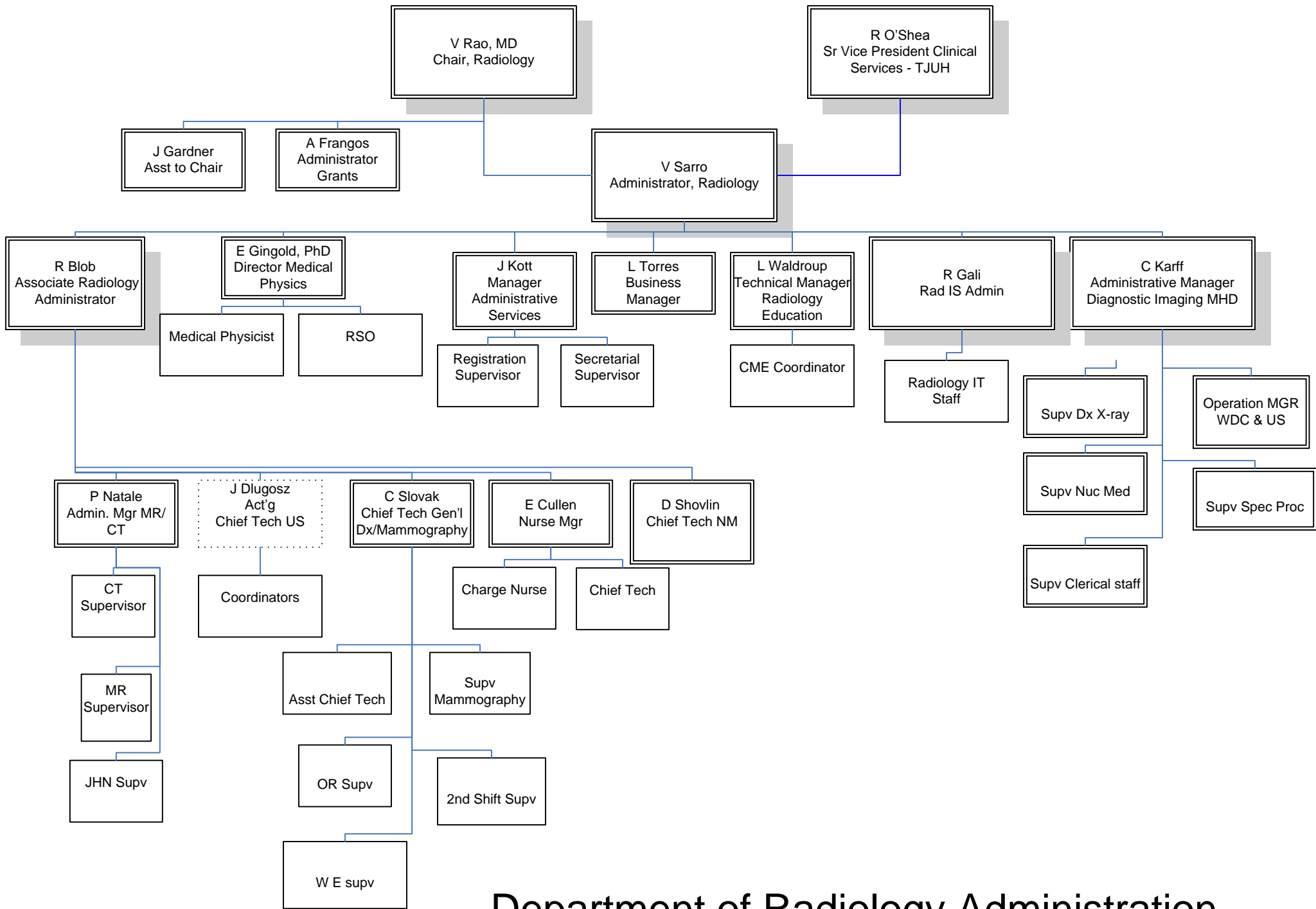
C. Merritt, MD

RESEARCH

B. Goldberg, MD
E. Halpern, MD

RESIDENCY
SELECTION

S. Deshmukh, MD



Department of Radiology Administration

Revised 11/13/2013

STATE OF THE DEPARTMENT
2012-2013
Chairman's Report
Vijay M. Rao, M.D., F.A.C.R.

We had a busy and exciting year with many new developments. First, we planned to create an Emergency Radiology section with on site faculty coverage after hours to provide final reads to the Emergency Department. We recruited three faculty radiologists to be onsite after hours 365 days a year. Second, we planned a complete reorganization of the department workflow with further integration of Methodist Hospital coverage and increased staffing of the satellite centers. Third, we deployed a fully functional home PACS workstations for faculty. Every faculty member now has full capability to view and dictate imaging examinations on the PACS at home. Many thanks go to our IT team under the leadership of Raja Gali. Thanks also go to Ed Daou from our hospital IS team who helped with this monumental task. It was a job well done resulting in improved faculty satisfaction. Fourth, we celebrated the grand opening of a new state-of-the-art joint venture MRI center in Collegetown in a highly visible and desirable location, replacing the older center. This center is an expanded version with the addition of an x-ray unit and ultrasound. This center is doing well and has exceeded our expectations for MRI volume. Fifth, we negotiated a new contract with Independence Imaging for providing professional services. Independence Imaging is an MRI center co-located with Vincera Institute in the Navy Yard.

Many thanks to David McQuaid for giving us the capital for the following much needed replacements that allow us to provide quality imaging services to our patients. We replaced an outdated 16 slice CT scanner with a state-of-the-art 64 slice CT GE 750 HD with spectral imaging capability at Jefferson Hospital for Neurosciences. We are now able to provide advanced neuroimaging for our patients. We also acquired three GE Logiq S8 ultrasound units replacing the older units at TJUH and two Philips iU22 units at Methodist Hospital. A new digital radiography unit at Methodist was installed.

In education, we continued our strong reputation as a top institution for young radiology trainees. We received 713 applications for our ten residency slots. Our fellowship programs continued to be popular. We sponsored a number of CME courses that were well received. Most were in ultrasound but there were others as well. We produce most of these courses right in our department, which helps save costs – an important advantage, since CME in radiology has become highly competitive.

We had a productive year in research as well. Despite an ever-increasing clinical and administrative workload, our faculty was able to produce 84 peer reviewed publications, books, and book chapters and a large number of presentations at national meetings or at other academic institutions. The details can be seen elsewhere in this report. We also had 28 research grants from various sources, such as the NIH, foundations, and industry. These produced close to \$1.4 million in current year funding.

There are many individuals who contribute to our success – far too many to mention here by name, but I'd like to single out a few. JoAnn Gardner has been a loyal and dedicated administrative assistant who has been a great help to me. Victor Sarro has worked very hard and effectively wearing two hats as both the departmental administrator and business

manager. Our vice chairs also play vital roles – Adam Zoga, M.D. in clinical practice, Levon Nazarian, M.D. in education; Ethan Halpern, M.D. in research; Chris Merritt, M.D. in quality assurance and performance improvement; Christopher Roth, M.D. in Methodist Radiology; and Adam Flanders, M.D. in informatics. My thanks go to all of them.

Many thanks go to Adam Zoga, M.D. and Sandeep Deshmukh M.D. for their leadership in helping build business at our satellite centers. I certainly want to thank all of our division directors, who have to assume large administrative responsibilities, in addition to their clinical and teaching workloads. They are all working very hard and they play crucial role in keeping our department running smoothly.

Special thanks go to Andrea Frangos for her diligence in compiling this report in addition to her traditional responsibilities in the department.

FACULTY RETENTION, RECRUITMENT AND DEVELOPMENT

We recruited three outstanding, extremely well trained radiologists from top institutions to join our faculty to serve in the Emergency Radiology section. Santosh Selvarajan, M.D. completed fellowships in abdominal imaging and neuroradiology at the Brigham and Women's Hospital in Boston. Chhavi Kaushik, M.D. completed a neuroradiology fellowship at the University of Arkansas and stayed on faculty for a year. Pranshu Sharma, M.D. completed fellowship in neuroradiology and abdominal imaging with us at Thomas Jefferson University.

Kiran Talekar, M.D. joined us in the neuroradiology division. He completed a neuroradiology fellowship at the University of Wisconsin. Subsequently he joined our department and completed 2 years of a neuroradiology fellowship, as well as one year in abdominal imaging. Andrej Lyshchik, M.D., Ph.D. joined us in the ultrasound division. He completed fellowships in abdominal imaging and interventional radiology from Vanderbilt University Medical Center.

We were sad to see Dr. Barry Goldberg, a pioneer in ultrasound, retire, but we are proud to honor his legacy at Jefferson. Dr. Daniel Brown moved to Nashville to work at Vanderbilt for personal reasons. Dr. Manoharan Muthuvelu decided to pursue a second fellowship in cardiovascular radiology at Cleveland Clinic after serving as a faculty member for 5 years. Dr. Paul Hobbs moved to Atlanta for family reasons and joined a private practice group and Dr. Barbara Cavanaugh stepped down as the division head, and she subsequently resigned.

In FY'14, Lisa Zorn-Smeglin, M.D. will join us in the breast imaging division. She completed her fellowship and served on the faculty in breast imaging at the Brigham and Women's Hospital in Boston for two years. Susan Shamimi-Noori, M.D. will join us in interventional radiology. She completed her residency at the University of Pennsylvania and fellowship in IR at Northwestern which is one of the top IR training programs in the country.

FACULTY DEVELOPMENT, HONORS AND PROMOTIONS

Several faculty members received numerous honors which are listed in the appendix under individual reports. I would like to highlight just a few major accolades: Dr. Annina Wilkes was selected to participate in the International Visiting Professor Program sponsored by the RSNA. Dr. Levon Nazarian continues to serve as editor of the *Journal of Ultrasound in Medicine* and also received both the 2013 Robert H. Condon, MD Teaching Award given by the Physical Medicine and Rehabilitation residents at Thomas Jefferson University Hospital and the 2013 Jefferson Medical College Outstanding Clinician Award – Hospital Based Medicine Category. Dr. William Morrison became the president-elect of the Society of Skeletal Radiology. Dr. Elizabeth Hsu received the Dean's Award for Excellence in Education at Jefferson Medical College. Drs. David Eschelman and Carin Gonsalves received the Jefferson Medical College Faculty Team Achievement Award for Collaborative Work as a Member of the Metastatic Uveal Melanoma Program. In addition, a grant was established by the Melanoma Research Foundation under the name of Dr. Eschelman – the Dr. David J. Eschelman Grant for Ocular Melanoma Research. Dr. Adam Flanders was named president-elect of the American Society of Spine Radiology. In addition, several of our faculty received recognition as best doctors: Dr. Daniel Brown by Castle Connolly Medical Ltd. as one of America's Top Doctors and Top Doctors for Cancer; Dr. Vijay Rao by Castle Connolly Medical Ltd. as one of America's Top Doctors for Cancer, America's Best Doctors, Philadelphia Top Docs, and Top 10 Doctors list by Vitalstm; and Drs. Geoffrey Gardiner and Levon Nazarian as Best Doctors in America. Dr. Vijay Rao continued in her role on the Board of the Directors of the Radiological Society of North America, the largest radiological society. This is quite an honor roll for our department on the national and international scene.

CLINICAL ACTIVITIES

In 2012-2013, our clinical practice remained relatively stable considering the national trends. At the center city locations, we experience a 1.7% drop in overall volume. We experienced a drop across all modalities save interventional radiology and breast imaging. The largest drop was in nuclear medicine and PET, nearly 10%. Both MRI and CT were down by 2.4%. On a positive note, we experienced 3.4% growth in IR and 1.1% growth in breast imaging.

There have been many favorable developments at **Methodist radiology** over the past year. There has been a substantial escalation in ultrasound examinations to evaluate joints, soft tissue masses and hernias in conjunction with musculoskeletal ultrasound and the musculoskeletal division. The newly acquired mobile MR unit has increased the MRI capacity and resulted in technical improvements, leading to the ability to now offer MR enterography. The state-of-the art interventional radiology equipment installed last fiscal year allows Methodist to now offer rotational angiography, previously unavailable on the old system. The department is proud to state that Methodist radiology is now offering breast imaging services as an ACR-accredited Breast Imaging Center of Excellence. Additionally, the second digital radiography unit was installed in the Emergency Department and the final two Philips iU22s ultrasound units were deployed, guaranteeing consistently high-quality exams to all Methodist patients

In **body CT**, at Thomas Jefferson University Hospital, CT colonography is now available as a same day add-on when there is an incomplete colonoscopy. Additionally, CT colonography is now performed at the East Norriton outpatient center. To improve care for patients receiving CT, the CT technologists have worked with the nursing staff to create a FAQ. Orders for oral contrast have been clarified in Jeff Chart.

In **body MR**, we continue to use the standard contrast agent Gadavist instead of Magnevist at Thomas Jefferson University Hospital our outpatient imaging sites. This is a more stable agent and has had no reports of nephrogenic systemic fibrosis and a slightly higher relaxivity with no difference in cost. Body MR exams performed at Methodist Hospital are now being read at Thomas Jefferson University Hospital. Additionally, the new outpatient center in Collegeville has opened, equipped with a modern widebore 1.5T MRI system, which we can market to increase body MRI volume.

In **nuclear medicine**, the addition of FRAX analysis to DEXA scans, in bone densitometry studies on patients in which osteopenia has been untreated is being used. The purpose is to predict the 10-year fracture risk of osteoporotic fractures. It is a tool used by the referring clinician to determine whether or not therapy is indicated.

In **ultrasound**, post-operative evaluation of arteriovenous fistula is now being offered, while the services offered through the Jefferson Center for Diagnostic and Interventional Musculoskeletal Ultrasound have been expanded to five days a week. All cases from the three Thomas Jefferson University Hospitals are read by subspecialized Ultrasound attendings on call, including Jefferson Hospital for Neurosciences carotid ultrasounds when the ophthalmologist-medical director is unavailable. To improve patient care, the Acuson unit was replaced with Philips iU22 unit semi-emergently, three new GE Logiq S8 units were acquired, and the musculoskeletal ultrasound area in the Clinical Office Building located at 909 Walnut Street was renovated.

In **interventional radiology**, two complex clinical services have been reintroduced: lymphangiography and thoracic duct embolization for chylous effusions. Additionally, sclerotherapy for spider veins is now being offered at the Jefferson Center City Imaging Center.

Musculoskeletal radiology is now offering arthrography at all three new outpatient locations. A reorganization of workflow in the division has been performed to accommodate late staffing, Emergency Department and Methodist Hospital coverage, increased coverage of the outpatient centers, and implementation of home workstations.

The division of **chest radiology** now offers CT lung cancer screening at the center city outpatient imaging center, while the **breast imaging** division now offers chest wall ultrasound for lymph node evaluation/ surveillance in patients with inflammatory breast carcinoma and Bard vacuum assisted core biopsy for stereotactic and MRI guided biopsy. **Neuroradiology** has increased utilization of time resolved MR angiography and MR venography imaging (TRICKS).

PLANNED NEW CLINICAL FACILITIES AND PROGRAMS

Jefferson Radiology continues to be on leading edge of imaging with improved current clinical programs and exciting new clinical services planned for the upcoming year. In **body CT**, a CT peripheral angiography protocol will be developed to facilitate the use by scheduling in any outpatient slot. Dual energy CT scans for renal stone characterization as an outpatient procedure will be offered and continued simplification of the CT contrast protocol will be performed.

Interventional radiology is planning to participate in the Thomas Jefferson Fibroid Center, which will potentially increase the number of uterine artery embolization procedures performed by our division. It is also hoped, depending on progression of construction, to offer a new biopsy service. In **breast imaging**, new breast density systems will be available at the Breast Imaging Center. Additionally, the use of digital breast tomosynthesis and automated whole breast ultrasound will be examined.

In the **ultrasound division**, all biopsy services will be centralized on 3 Gibbon, with the exceptions of prostate and dedicated thyroid clinics, which will continue on 7 Thompson. Within the next six months, musculoskeletal ultrasound will receive a new therapeutic device called FAST (Fasciotomy And Surgical Tenotomy) which provides a minimally invasive treatment for removing scar tissue from a tendon. In addition, off label use of ultrasound contrast agents will begin to answer several specific clinical questions such as lesion characterization of some liver and kidney lesions.

The **musculoskeletal division** will begin performing arthrography, joint injection, aspiration as well as possible pain management procedures such as nerve blocks at the Independence Imaging outpatient center. In addition, increased therapeutic musculoskeletal ultrasound at the Collegeville and East Norriton outpatient imaging centers are planned.

Lung ventilation imaging with xenon-133 gas will initiate at Methodist Radiology in the upcoming year in **nuclear medicine**. This was not possible previously, due to the absence of a proper ventilation system. For sentinel lymph node mapping in breast cancer and melanoma, the division will use a new radiopharmaceutical called lymphoseek. Currently, the standard of care is the intradermal or subcutaneous injection of technetium-99 sulfur colloid particles surrounding the tumor. As time progresses, the sulfur colloid enters the lymphatic channels and migrates to the lymph node station draining the tumor; these nodes would then be biopsied by the surgeon. Lymphoseek is technetium-99 labeled protein that is bound to receptors within the lymph nodes with shorter procedure time.

PHYSICS

The Physics Division of the Department of Radiology provides expertise on imaging physics in support of the three-part mission of the Department: clinical service to patients, education, and research. In support of clinical operations, the division performs equipment testing and consultative services to optimize clinical imaging performance, minimize radiation dose to patients and to staff, and ensure compliance with regulatory and accreditation bodies. Educational activities include providing instruction to radiology

residents and Jefferson Medical College medical students about the physics of medical imaging. In the area of research, the physicists conduct applied research on new methods of quality control, patient dose monitoring and imaging equipment characterization, as well as contribute to research lead by other department faculty.

Staffing consists of two board-certified diagnostic medical physicists. Eric Gingold, Ph.D. is the director of the division, and Jaydev Dave, Ph.D. is a staff physicist. The team supports Radiology operations at Thomas Jefferson University Hospital, Jefferson Hospital for Neurosciences, and Methodist Hospital. Equipment responsibilities include 55 radiographic/fluoroscopic tubes, 15 angiographic suites, 8 mammography units, 9 CT scanners, 8 MRIs, and 11 nuclear gamma cameras. In June 2013, the Nuclear Medicine section at Methodist Hospital became accredited by the American College of Radiology. Methodist is now accredited in all imaging modalities, with Jefferson physicists providing essential performance evaluation, phantom testing, and quality assurance oversight. The annual Mammography Quality Standards Act (MQSA) inspections found the Department to be in full compliance. In addition to evaluating imaging equipment performance, the physicists monitor patient radiation doses from CT and fluoroscopy, particularly interventional procedures.

The objective of the imaging physics and basic science educational program is to provide radiology residents with a solid foundation in radiation physics, image science and radiation biology, along with practical knowledge about the science and engineering principles underlying the core imaging modalities. Educational activities include a daily lecture series for first year residents in July and August, monthly conferences throughout the academic year, and daily “board review” style Q&A sessions for second, third, and fourth year residents in June. A new challenge this year has been adapting the instruction to the American Board of Radiology “Exam of the Future” which begins with the inaugural “Core” exam to be given 9/30/13 – 10/3/13. Dr. Gingold co-chairs a joint committee of the Radiological Society of North America and American Association of Physicists in Medicine that oversees the Radiological Society of North America web-based physics instructional modules.

The physics group continues to be productive in the area of research. A technical research article was published in *AJR* in January 2013. Research was presented at the American Association of Physicists in Medicine Annual Meeting in July 2012 and the Radiological Society of North America Annual Meeting in December of 2012. Both Dr. Gingold and Dr. Dave are active on committees and task groups of the American Association of Physicists in Medicine, working to advance medical physics practice nationally by developing new methodologies to measure and improve quality, particularly in the areas of digital radiography and fluoroscopy.

CLINICAL INFORMATICS

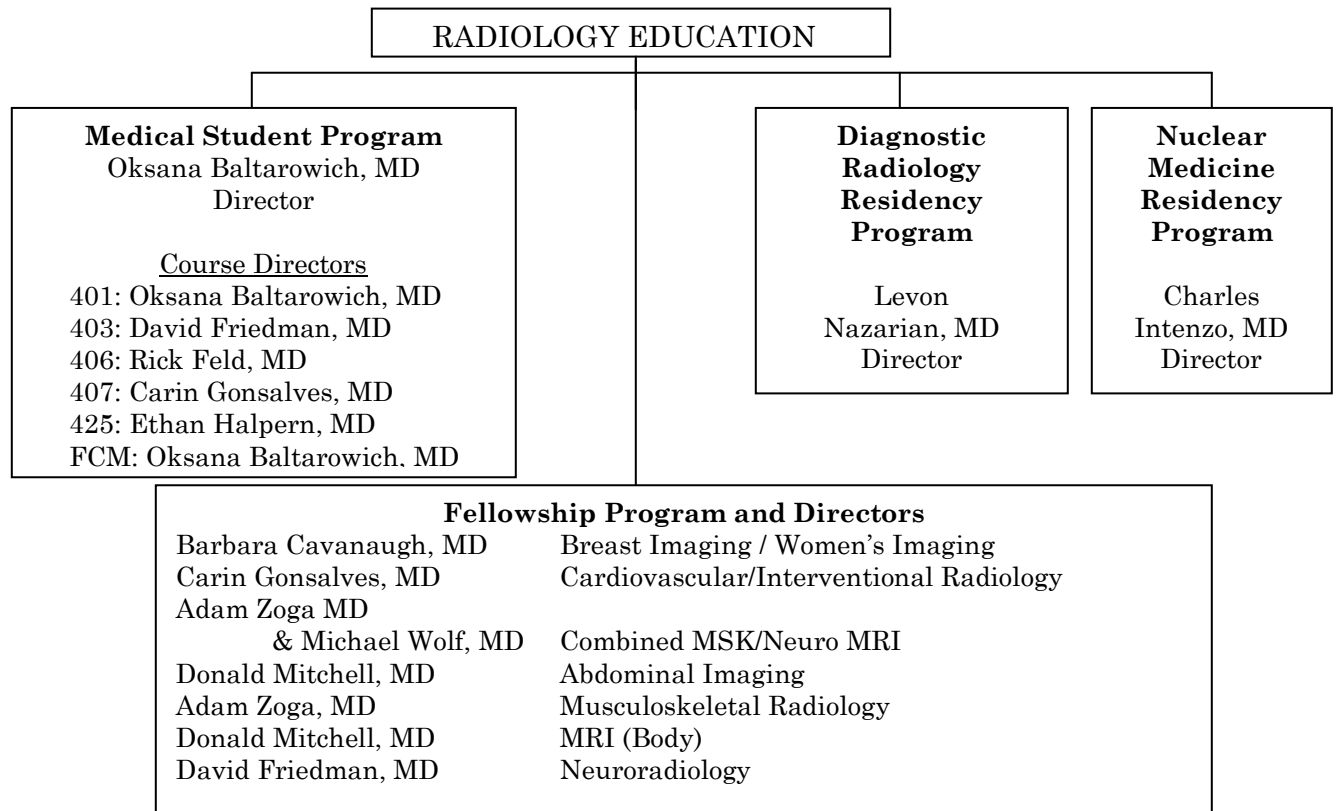
The Information Technology section of the Department of Radiology continues to support the clinical needs and mission of the department. Primordial Instant Messaging system has been implemented to improve the communication between technologists, residents, and the faculty members at Methodist campus. An Emergency Department communication

module has also been piloted at Methodist Emergency Department and has been quite successful in communicating the results to the Emergency Department in a timely fashion.

Other accomplishments involve rolling out of the new Windows 7 machines to replace the existing old reading stations to make them 4-monitor capable. Home reading PACS stations were installed for faculty which allowed them to review and sign off on cases resulting in improved turnaround time. Life Image was integrated with Philips iSite to improve the efficiency of CD imports for referring physicians. Testing for Terrarecon 3D reconstruction software was begun. Additionally, the rollout of the GE Advantage Windows workstation, which performs 3D reconstruction, was initiated.

Future planned initiatives include installation of Critical Results Communications Module and Physician Scheduling software.

EDUCATIONAL PROGRAMS



RESIDENCY TRAINING PROGRAM

The educational programs at Thomas Jefferson University Hospital continue to be one of the major strengths of our department. Our residency program is approved for 40 residents and fully accredited by the ACGME.

The Radiology residency program is nationally recognized as one of the top programs in the country. Our faculty are committed to a high caliber of teaching in spite of increased clinical workload. The goal of our residency program is to produce competent radiologists well trained in all aspects of diagnostic radiology.

Upon finishing their training, our residents will be able to pursue a career in either an academic or private practice environment. Nine out of ten of our senior residents passed the written boards and nine out of our ten senior residents took and passed the oral portions of the American Board of Radiology Examination. We have a reputation for the highest caliber fellowship programs and we are extremely pleased that this year five of the nine residents have chosen to stay on at Jefferson for additional fellowship training. Many thanks go to Levon Nazarian, M.D., for his outstanding leadership as the program director. Many thanks to Pamela Coyle, Residency Coordinator, for providing outstanding assistance throughout the year.

Residency Selection: This year we received 713 applications for ten positions and interviewed 75 candidates. We matched all of our positions from among our top candidates under the leadership of Dr. Sandeep Deshmukh, Chairman of the Residency Selection Committee. We also accepted another candidate outside the match. The teaching and research reputation, as well availability of cutting edge technology such as 256 multidetector CT, PET scanning and 3T MR keeps us competitive with other top institutions in the country.

Resident research is actively encouraged. All residents are required to complete at least one project by the end of their third year, though many do more. Many of our residents presented papers at national meetings. One of our residents, Vahe Zohrabian, M.D., received the RSNA Research and Education Foundation Roentgen Resident Research Award which was presented to him at the resident's graduation dinner.

In order to facilitate clinical research among radiology residents, each resident attends a monthly seminar series to review the basics of clinical research study design and implementation prior to presenting his/her own research plan. The seminar series includes eight lectures on hypothesis generation and testing, power analysis, study design, measures of association (sensitivity/specificity/likelihood ratios/predictive value/ROC analysis), bias & confounding, IRB/HIPPA issues, research ethics and health services research. These sessions are structured to comply with the core curriculum on research and statistics for radiology residents developed by the Association of University Radiologists. Additional sessions are devoted to allow second year residents to present their proposed projects in a small group session for comments prior to their required presentations to the entire department of Radiology. The series was conducted jointly by Dr. Ethan Halpern and Ms. Andrea Frangos.

Residents receive extensive clinical training in all areas of Diagnostic Radiology. Clinical rotations are in compliance with guidelines required by the ACGME and/or recommended by the Association of Program Directors in Radiology (APDR). Almost all training takes place on the Jefferson campus, save pediatric radiology. Residents spend a total of 3 months at A.I. DuPont and get an outstanding education in pediatric radiology.

Residents Ian P. Hayden, M.D., Hassan Irshad, M.D., Matthew Morgan, M.D., Richard E. Sharpe, M.D., Amelia Wnorowski, M.D., and Zombor Zoltani, M.D. received recognition for excellence in medical student teaching.

TRAINING PROGRAMS FOR FELLOWS

Our fellowship programs had another successful year. There is an increasing number of extremely well qualified applicants in most of the areas offered by our department including: interventional radiology, body MRI, breast imaging, combined musculoskeletal and neuro MRI, neuroradiology/ENT, US/CT/MRI, and musculoskeletal radiology. All of the above programs received very positive year-end critiques from the graduating fellows.

The **Abdominal Imaging Fellowship**, under the direction of Dr. Donald Mitchell is an ACGME accredited program. Six fellows graduated: Dr. Aaron Burns will be on staff at Our Lady of Lourdes in Camden; Dr. Jihad Fataftah will be returning to Jordan and will be an attending at Hashimite University; Dr. Peter Ghobrial will become an attending in Abdominal Imaging at UH Geneva Medical Center; Dr. Cyrus Golsaz will be taking a second fellowship in musculoskeletal radiology at Johns Hopkins Medical Institution; Dr. Bhishak Kamat accepted a fellowship position in Nuclear Medicine and Molecular Imaging at the University of Pennsylvania; and Dr. Arash Radparvar went on to a private practice located in California.

The **Vascular and Interventional (VIR) Fellowship**, under the direction of Carin Gonsalves, M.D., is an ACGME accredited one year program. We currently match two fellows per year. The program graduated Dr. Andrew Maleson, who will become staff at Diagnostic Imaging, Inc. located in Trevese, Pennsylvania; Dr. Michael Petroziello accepted a staff position in Interventional Radiology at Roswell Park Cancer Institute, Buffalo, New York; and Dr. Mark Werley went on to a private practice in interventional and diagnostic radiology.

The **Body MRI Fellowship**, under the direction of Donald Mitchell, M.D., has remained popular because of the quality of faculty, the large and diverse case volume, and because Body MRI continues to be one of the most rapidly expanding areas of clinical practice. This fellowship includes training in all areas of body MRI, including cardiac, thoracic, vascular, abdominal, pelvic, and breast applications. The graduating fellow, Dr. Hugh White, joined the Abdominal Imaging faculty at the University of Texas Health Science Center in San Antonio.

The **Musculoskeletal Fellowship**, under the direction of Adam Zoga, M.D., graduated three outstanding fellows: Dr. Waseem Khan will join Rush Copley Memorial Hospital as a general radiologist; Dr. Andrew Palisch accepted a position as an assistant professor in Diagnostic Radiology, Musculoskeletal at Baylor College of Medicine in Houston, Texas; and Dr. Pranshu Sharma will join our faculty and work in the newly formed Emergency Radiology section. This was a very strong clinical team with academic productivity as well. The musculoskeletal fellowship positions remain highly coveted as we received more than 70 applications for the 2012-2013 positions.

The **Neuroradiology/ENT Radiology Fellowship**, under the direction of David Friedman, M.D., graduated one-year fellows, Dr. Ashish Gandhe completed his advanced

neuroradiology fellowship and will continue his training with a fellowship in Abdominal Imaging; Dr. Jawaad Mohiuddin accepted a position as a general radiologist; Dr. Falguni Patel is pursuing a breast imaging fellowship at Mercy Medical Center in Baltimore; and Dr. Raj Patel will be completing a Musculoskeletal fellowship at the University of Cincinnati.

The **Breast Imaging Fellowship**, under the direction of Barbara C. Cavanaugh, M.D., offers training in screening and diagnostic mammography, breast ultrasound, breast MRI, image guided percutaneous needle localization and biopsy using mammography, ultrasound and MRI. We also participate in clinical trials for innovative imaging of the breast. Dr. Courtney Hoey will become staff in the specialty of Breast Imaging at Summit Radiological Associates in New Providence, New Jersey.

A combined **Musculoskeletal/ Neuro MRI Fellowship**, under the direction of Michael Wolf, M.D. and Adam Zoga, M.D., is a unique program. Fellows receive training in MRI of musculoskeletal diseases as well as in neuroradiology. This remains a very popular fellowship. Three strong clinical Combined Musculoskeletal/Neuro MRI fellows completed the program: Dr. Luke Maj will become staff at Physicians Imaging and Vein Care Clinic, El Paso, Texas; Dr. Ariel Prager will be joining a private practice in Jacksonville, Florida; and Dr. Michael Scanlan will become staff at Radiology Associates of the Mainline as a diagnostic radiologist.

TEACHING PROGRAMS FOR MEDICAL STUDENTS

I am pleased that radiology continues to be included in the core curriculum for sophomore students in the Foundations of Clinical Medicine Course. I wish to thank Oksana Baltarowich, M.D. and Terri Tuckman, M.D., who willingly contributed their time to this important teaching exercise for Jefferson medical students. The radiology topics presented were Introduction to Diagnostic Imaging, Introduction to Chest Radiology, Women's Imaging, and Abdominal Imaging. I am also pleased that the freshman Neurology Block continues to include radiology and wish to thank Dr. Adam Flanders for continuing to teach Neuroradiological Imaging as part of the curriculum.

I especially wish to acknowledge contributions of Dr. Oksana Baltarowich who continues in the role of Director of Medical Student Education. She is a gifted educator and receives glowing evaluations from medical students and several students send her personal thank you notes. She has done a spectacular job of restructuring the course and developing new content material. As a result, the RAD 401 course has received rave reviews and has become one of the most desirable electives for senior medical students.

Five subspecialty electives are offered by our department, which include Diagnostic Radiology, Interventional Radiology, Neuroradiology, Cross-Sectional Imaging (Ultrasound/CT/MRI), and Research in Radiology. The radiology electives remained quite popular and were completed by 167 members of the senior class, either here or at an outside institution. The senior students can choose to attend one or more of the five separate electives

The Neuroradiology elective was completed by 7 senior medical students. Electives in Cross-Sectional Imaging and Interventional Radiology were each completed by 4 students.

All of these courses received outstanding reviews from the students. I wish to thank all the course coordinators for their stellar effort in enhancing medical student education – Oksana Baltarowich, M.D., for General Radiology, David Friedman, M.D., for Neuroradiology, Rick Feld, M.D., for Cross-Sectional Imaging, Carin Gonsalves, M.D., for Interventional Radiology, and Ethan Halpern, M.D., for Research in Radiology.

This past year we continued to collaborate with other departments in the education of Jefferson Medical College medical students. Once again, Oksana Baltarowich, M.D. taught two radiology sessions in the “Gateway to Internship” fourth year medical student, which is designed to prepare medical students for the transition to internship. Dr. Baltarowich’s lecture on Abdominal Imaging has been videotaped and is available for viewing by third year medical students during their Surgery Clerkship. We continue to give monthly Chest Radiology lecture to third year medical students rotating through the Internal Medicine Clerkship at Thomas Jefferson University Hospital and radiology residents have been most helpful in teaching these monthly sessions. We continue to place our efforts into teaching medical students because we believe that every graduating medical student should have a working knowledge of Diagnostic Imaging, which is a vital aspect of patient management in virtually all primary and specialty areas of medicine.

CONTINUING MEDICAL EDUCATION PROGRAMS

Radiology Grand Rounds and Radiology Research Conferences: Twenty weekly conferences were held during the 2012-2013 in Radiology, alternating between Grand Rounds, Radiology Research Conferences and Journal Clubs. Grand Round speakers covered a wide range of interesting topics in all areas of radiology. The Radiology Research Conferences allowed faculty, residents, and fellows in the department the opportunity to present the results of their research activities. Additionally, after each presentation, a discussion of the study design and methodology provided a useful learning session for all.

Fifth Annual David C. Levin Lecture: The Department was pleased to present the endowed lecture in honor of Dr. David Levin, Professor Emeritus and former chair of the department on September 20, 2012. The lecture titled: “Building a Better Mousetrap” was given by Dr. N. Reed Dunnick, Fred Jenner Hodges Professor and Chair, Department of Radiology, University of Michigan Health System.

Jefferson Ultrasound Research and Education Institute (JUREI): The Jefferson Ultrasound Research and Education Institute, under the leadership of Barry B. Goldberg, M.D., continued its educational programs with 30 courses offered in many aspects of ultrasound. The annual Leading Edge meeting, which was held at the Golden Nugget in Atlantic City, was a success with attendance of greater than 900 people. The program was supported by a wide variety of exhibitors and lecturers from this country and abroad providing symposia on Ob/Gyn, vascular ultrasound imaging, ultrasound physics, sonomammography, musculoskeletal, pediatric ultrasound, and ultrasound contrast agents. JUREI also offers clinical visiting fellowships and academic fellowships, with visiting fellows from various countries. There is an emphasis on assisting those physicians from less advantaged areas of the world. Through funded education grants, both from government and foundations, our center has established over 70 ultrasound education centers in emerging and underdeveloped countries.

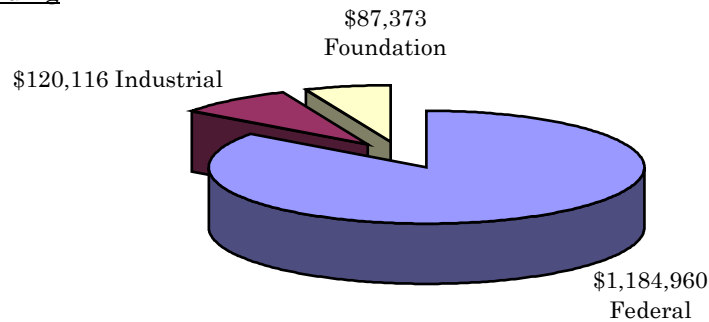
RESEARCH ACTIVITIES

Although the demands of clinical activities continue to increase, as indicated in our clinical productivity, the department's research productivity remained strong. There were 16 NIH or other federal grants active during the year, in addition to 1 foundation/medical society grant, and another 11 industrial grants. As a group, these grants brought in total current year funding of \$1,392,449 including \$1,015,061 in direct support and \$377,388 in indirect support. This decrease in funding represents the incredibly tough climate in federal funding we are facing in an academic institution. However, this is not for lack of trying, as shown in Appendix 2 – Submitted Grants. During the fiscal year, there were 10 federal grants and 2 foundation grants submitted, as well as initiation of contracts for 2 industrial grants. We had 209 publications in the medical literature (including journal articles, books and book chapters, and published abstracts).

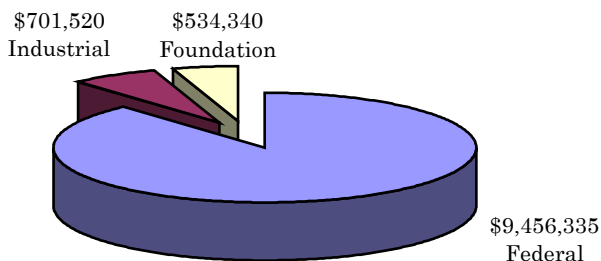
Two Judy Dubbs Memorial Research Awards were presented; one to a junior faculty member for outstanding scholarly work and one to a post-doctoral fellow who excelled in independent research. The awards were presented to Richard Gorniak, M.D., whose expertise and research interests are in neuroimaging and informatics, and Jaydev Dave, Ph.D., a staff physicist whose research concentrates on radiation dose and contrast-enhanced ultrasound.

Research accomplishments of two faculty members were acknowledged by journals. Dr. Paras Lakhani received the Most Downloaded Paper in 2012 Award for the *Journal of Digital Imaging* for a manuscript entitled, "Is Android or iPhone the platform for innovation in imaging informatics." Dr. David Levin received the Best Article, Health Services Research and Policy Category, *Journal of the American College of Radiology*.

2012-2013 Fiscal Year Funding



Total Funding (all budget years)



The **Jefferson Molecular and Biomedical Imaging Core Facility**, under the direction of Mathew Thakur, Ph.D., has had another productive year continuing to expand its role in pre-clinical research on campus. In addition to the existing grants utilizing the facility, two new grants, one NIH and one industrial, were obtained in which animal imaging shall play a vital role. The work carried out in the imaging facility resulted in at least 4 peer-reviewed publications and 12 abstracts at national and international conferences. While the current MicroCAT II CT unit is outdated, Dr. Mathew Thakur has submitted an S10 NIH grant to acquire a new SPECT/CT that will dock into the current Siemens PET Inveon. Addition of a new CT system will greatly enhance the capabilities of the facility. Two new grants with animal imaging components will be submitted to NIH in the fall. Two new provisional patent applications were submitted based on animal imaging work. Lastly, the animal imaging facility was included in the Kimmel Cancer Center core grant resubmission and received high scores.

The **radiopharmaceutical research/molecular imaging program**, under the leadership of Mathew Thakur, Ph.D., continues to be extremely productive. During the past year, Dr. Thakur published a manuscript in the *Journal of Nuclear Medicine* that is drawing considerable attention and is based on the findings of his NIH study evaluating a novel Cu-64 tracer developed in his laboratory with Positron Emission Mammography (PEM) imaging. NuView Life Sciences which has licensed the technology is seeking a partnership with a big Pharma for commercially sponsored clinical trials. FDA approval for a new eIND was obtained in May 2013 to perform a new clinical feasibility trial for PET imaging of prostate cancer. Three new projects, at least two of which may lead to new grants, were initiated in collaboration with the Department of Urology and Radiation Oncology. The study with urology involved gene based detection of genitourinary cancer cells, while the project with radiation oncology hypothesized that a VPAC1 specific biomolecule labeled with a near infrared fluorophore can be targeted for detection of tumor cells in urine from prostate and bladder cancer. Collaborations with other departments in the university, including Biochemistry and Cell Biology, Pediatric Medicine, Pathology and Cell Biology, Urology, as well as Molecular Engineering at Delaware University and NuView Inc. and Molecular Targeted Therapy, Inc. remain strong. These collaborations have been very productive and have potential to lead to grant funding.

The main thrust of the **ultrasound physics research program**, under the direction of Dr. Flemming Forsberg, continues to be in the use of microbubble-based ultrasound contrast agents. Dr. Forsberg continued his study of subharmonic pressure estimation to

monitor neoadjuvant therapy of breast cancer in an animal model and is now transitioning this project into a human pilot study (both projects funded by the DoD). Dr. Forsberg also received an R01 from the NIDDK on pressure estimation in portal hypertension and the human clinical trial (involving 300 subjects) is expected to commence in the new year. We also continued our NCI sponsored clinical trial of 3D subharmonic breast imaging in 450 patients together with Dr. Wilkes and associated funding from the DOD for a post-doctoral training grant (John Eisenbrey, PhD). Several smaller clinical trials on contrast ultrasound treatment monitoring are underway and we have continued our collaboration with industry exploring new ultrasound image processing techniques. Finally we received a small animal, high-frequency ultrasound system (the Vevo 2100, Visualsonics, Toronto, Canada), which includes photoacoustic imaging, with funding from the NIH (an S10 grant) and we are exploring the capabilities of this new scanner in collaboration with Translational Medicine. There were five master's students and three doctoral students mentored by Dr. Forsberg last year. Amongst these Jaydev Dave obtained his PhD and Khoa Nguyen his MSc from Drexel University in 2012. Finally there are two post-doctoral students continuing their training in the laboratory: John Eisenbrey, Ph.D. and Priscilla Machado, M.D.

Our division of **diagnostic ultrasound**, under the leadership of Dr. Barry Goldberg, continued to be highly productive. A variety of basic science, animal, and clinical research studies were underway for the development and evaluation of ultrasound contrast agents and novel imaging techniques to improve the detection of diseases. Dr. Goldberg's Phase III clinical trial of SonoVue (an ultrasound contrast agent) for liver lesion characterization funded by Bracco has been completed. Thomas Jefferson was one of the highest recruiting sites in the country for this multi-center trial. Dr. Ji-Bin Liu continued to collaborate with the Department of Anesthesiology in both human and clinical trials investigating the use of a new glucose system. Dr. Nazarian continued his work in musculoskeletal ultrasound diagnosis and therapy.

In **breast imaging**, recruitment continued on several clinical trials led by Dr. Flemming Forsberg. These federally funded studies include subharmonic ultrasound breast imaging for detection of breast cancer, and to monitor neoadjuvant chemotherapy. Toshiba is also providing funding to examine a new ultrasound imaging, MicroPure imaging, for detecting and characterizing breast calcification. The division is also collaborating in the CALBG DCIS trial.

In **nuclear** medicine, Dr. Intenzo completed a PET trial sponsored by the American College of Radiology Imaging Network examining the use of 18-Fluorothymidine (FLT) PET for monitoring response of invasive ductal breast carcinoma to neoadjuvant therapy. A second trial sponsored by the American College of Radiology Imaging Network for FDG-PET/CT staging of head and neck cancer and its impact on the N0 neck surgical treatment in head and neck cancer continued. Finally, the division plays a key role in industry-funded clinical trials using combinations of chemotherapy and a radiolabeled therapeutic monoclonal antibody in patients

In **body MRI**, the division continued to evaluate the new internal radiology system for reporting hepatocellular carcinoma on MRI. The division has also been evaluating methods to optimize MR imaging, examining the use of MR for imaging uterine leiomyomas before and after embolization, defining appropriate gadolinium contrast agent selection, and

studying the use of cine MR enterography to assess bowel segments. Additionally, the division has begun collaboration with medical oncology and interventional radiology to assess liver metastases from uveal melanoma.

The main thrust of the research in **interventional radiology** continues to be examining outcomes associated with various treatments for liver and renal lesions. The group has had a very strong collaborative effort with Dr. Takami Sato's group for research on metastatic uveal melanoma, as well as gastroenterology for hepatocellular cancer. The division was involved in a registry study initiated by Memorial Sloan Kettering Cancer Center to collect information on patients undergoing ablation of renal lesions. In the upcoming year, a prospective registry of collection of information on these patients will be initiated. Additionally, Dr. Daniel Brown began enrollment in a phase III multicenter trial of intra-arterial TheraSphere for patients with unresectable hepatocellular carcinoma.

As in past years, **musculoskeletal imaging** was extensively published and presented research projects internationally on all aspects of orthopedic injury imaging. These areas include meniscal tears, the importance of meniscal biomechanics in the evolution of the osteoarthritis and the need for joint replacements in our society, MR imaging appearance of fractures, and discrimination of benign and malignant vertebral fractures. Orthopedic surgery collaborated on many of these projects. Dr. Adam Zoga continues to work with Dr. William Meyers at Drexel to research imaging of athletic pubalgia and core muscle injuries. Dr. Zoga has become a leading expert on this difficult topic.

Dr. Adam Flanders, in **neuroradiology**, continued his study funded by the Department of Defense to evaluate the use of novel MR biomarkers to predict outcome in spinal cord injury. Additionally, Dr. Flanders continued his work on a grant funded by the NIH to create an integrated biomedical informatics infrastructure for cancer research imaging. Additionally, imaging markers in glioma are being assessed to determine outcomes..

Dr. Gorniak continued his investigation into a technique logger to streamline image quality. Studies examining variability of neuroimaging utilization in a utilization management program were performed by Dr. David Friedman.

In **body CT**, Dr. Ethan Halpern continues his research in coronary CT angiography as a triple-rule-out exam and ventricular outflow. Given the concerns of radiation dose, research involving dose information and reduction in dose were performed by Dr. Eric Gingold and Dr. Jaydev Dave. Additionally, an investigation into the implications of reported results for preoperative imaging for resectable periampullary cancer was performed.

The **Methodist division** research initiatives focused on non-interpretive aspects of radiology, including workflow and efficiency issues and informatics tools. Included in these projects are assessments of productivity, structured reporting, and protocoling systems to improve technologist compliance. Additionally, the faculty in the division continued to collaborate with other faculty in the department on their respective areas of imaging expertise. **Methodist division** continues to undergo the gradual transformation from a community radiology practice to a hybrid community/academic model. Whereas research had been impractical in the past, with recent workflow and workload balancing changes implemented July 2012, research has become more highly prioritized and will continue to improve.

Our **health services research** group (Drs. Vijay Rao, David Levin, Laurence Parker, Richard Sharpe, Jr., and Ms. Andrea Frangos) continued to be highly productive in studying practice patterns and utilization trends in diagnostic imaging and interventions. We received continued funding from the American College of Radiology and additionally entered into a contractual arrangement with them for ad hoc analysis.

OPPORTUNITIES FOR EXTRAMURAL FUNDING

Although federal funding continues to be increasingly competitive, our department continued to strive to actively seek funding. Overall, the department submitted 10 federal grant proposals in FY'13, which are listed in Table 2 of the appendix. The proposals cover a broad spectrum of radiology research.

The American College of Radiology Imaging Network (ACRIN), an NCI- funded cooperative group, which has always remained a good source of extramural funding for the department, was incorporated with Eastern Cooperative Oncology Group (ECOG) to form ECOG-ACRIN. There are projects under development, which we hope to participate in and advance the mission of Thomas Jefferson University. While we will continue to pursue grant funds through the NIH and radiology foundations, many of which provide seed grants to gather pilot data for larger grant submissions, we also plan on pursuing funding from industry to sponsor our investigator initiated projects.

Partnerships with industry can also be a rich source of funding and research support. Additionally, research partnerships allow us to serve as beta sites for equipment and bring attention to our research endeavors. We have formed a collaborative relationship with Philips Medical Systems North America for evaluation and optimization of imaging equipment and techniques. The partnership has allowed us to optimize many of our imaging techniques with improvements in imaging protocols and analysis, thereby improving patient care. Faculty in ultrasound received several pilot grants awarded by Toshiba America Medical Systems, Lantheus Medical and GE Healthcare to study expanded use of modified ultrasound systems and ultrasound contrast agents.

Looking forward, many opportunities for grant funding in health services, population health and quality and safety have emerged which promote a multidisciplinary team approach. Our department will be exploring such opportunities in collaboration with other departments in the institution.

APPENDIX I

PUBLICATIONS

Journal Articles:

1. Ali MS, Amenta PS, Starke RM, Jabbour PM, Gonzalez LF, Tjounmakaris SI, Flanders AE, Rosenwasser RH, Dumont AS: Intracranial vertebral artery dissections: Evolving perspectives. *Interv Neuroradiol* 2012; 18(4):469-483.
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4. Burns AS, Marino RJ, Flanders AE, Flett H: Clinical diagnosis and prognosis following spinal cord injury. *Handb Clin Neurol* 2012; 109:47-62.
5. Chalouhi N, McMahon JF, Moukarzel LA, Starke RM, Jabbour P, Dumont AS, Tjounmakaris S, Gingold EL, Rosenwasser R, Gonzalez LF: Flow diversion versus traditional aneurysm embolization strategies: Analysis of fluoroscopy and procedure times. *J Neurointerv Surg* 2013; May 25 [Epub ahead of print].
6. Claudon M, Dietrich CF, Choi BI, Cosgrove DO, Kudo M, Nolsøe CP, Piscaglia F, Wilson SR, Barr RG, Chammas MC, Chaubal NG, Chen MH, Clevert DA, Correas JM, Ding H, Forsberg F, Fowlkes JB, Gibson RN, Goldberg BB, Lassau N, Leen EL, Mattrey RF, Moriyasu F, Solbiati L, Weskott HP, Xu HX; World Federation for Ultrasound in Medicine; European Federation for Societies for Ultrasound: Guidelines and good clinical practice recommendations for contrast enhanced ultrasound (CEUS) in the liver - Update 2012: A WFUMB-EFSUMB initiative in cooperation with representatives of AFSUMB, AIUM, ASUM, FLAUS and ICUS. *Ultraschall Med* 2013; 34(1):11-29.
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8. Dave JK, Gingold EL: Extraction of CT dose information from DICOM metadata: Automated Matlab-based approach. *Am J Roentgenol* 2013; 200(1):142-145.
9. Dave JK, Halldorsdottir VG, Eisenbrey JR, Merton DA, Liu JB, Machado P, Zhao H, Park S, Dianis S, Chalek CL, Thomenius KE, Brown DB, Forsberg F: On the implementation of an automated acoustic output optimization algorithm for subharmonic aided pressure estimation. *Ultrasonics* 2013; 53(4):880-888.

10. Dave JK, Halldorsdottir VG, Eisenbrey JR, Merton DA, Liu JB, Zhou JH, Wang HK, Park S, Dianis S, Chalek CL, Lin F, Thomenius KE, Brown DB, Forsberg F: Investigating the efficacy of subharmonic aided pressures estimation for portal vein pressures and portal hypertension monitoring. *Ultrasound Med Biol* 2012; 38(10):1784-1798.
11. Dave JK, Halldorsdottir VG, Eisenbrey JR, Raichlen JS, Liu JB, McDonald ME, Dickie K, Wang S, Leung C, Forsberg F: Subharmonic microbubble emissions for noninvasively tracking right ventricular pressures. *Am J Physiol Heart Circ Physiol* 2012; 303(1):H126-H132.
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APPENDIX II

FORMAL SCIENTIFIC PRESENTATIONS

OKSANA BALTAROWICH, M.D.

- February 28-29, 2013 Visiting Professor, Department of Radiology, St. Joseph Mercy Oakland, Pontiac, MI
- “Sonography of pelvic emergencies (includes Gyn and OB)”
 - “Most common fetal anomalies”
 - “Case review for senior residents”
- April 14-19, 2013 2013 American Roentgen Ray Annual Meeting, Washington, DC
- “Ectopic pregnancy: Usual and unusual”
- May 1, 2013 Department of Radiology Grand Rounds, Mount Sinai Hospital, New York, NY
- “First trimester sonography: Another look”
 - “Obstetrical case review”
- May 21-23, 2013 The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
- “Is it really pelvic pain? (Non-GI, Non-GU, Non-GYN causes)”

DANIEL BROWN, M.D.

- October 3, 2012 Webinar, sponsored by the Society of Interventional Radiology
- “Drug eluting beads: Hepatocellular carcinoma with colorectal on the side”
 - “Current status of locoregional liver therapy: An evidence based review”
- November 9-11, 2012 Synergy 2012: A Multidisciplinary Approach to Interventional Oncology, sponsored by the University of Miami Miller School of Medicine, Miami, FL
- “Hepatocellular carcinoma”
 - “Conventional TACE: Still relevant”
 - “Y90 in metastatic colorectal carcinoma”
 - “Cone-beam CT: Pros and cons”
- November 14-16, 2012 Advanced International Management (AIM) Symposium, New York, NY
- “TACE or ablation: What’s best or is there a role for both?”
 - “Metastatic disease: When should you use TACE, Y90 or chemosaturatation?”
 - “Radioembolization, chemoembolization and chemosaturatation”
- November 25-30, 2012 98th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- “Radiofrequency ablation”
 - “Complications in interventional oncology – Avoidance, recognition, and management”

- January 18-19, 2013 International Symposium on Endovascular Therapy, The 5th Annual Symposium on Clinical Interventional Oncology, Miami, FL
- “Tumor board colorectal cancer case-based review”
 - “Smooth operator: Case-based techniques in the treatment of renal cell carcinoma”
 - “Yearbook in interventional oncology: Modality and technology transcatheter arterial chemoembolization (TACE)”
 - “I’ll have the combo plate: Cases of combination therapies”
- February 8-9, 2013 Cancer Imaging and Radiation Therapy Symposium, sponsored by the American Society for Radiation Oncology and the Radiological Society of North America, Orlando, FL
- “Interventional oncology”
 - “Cancer imaging and radiation therapy symposium: A multidisciplinary approach”
- April 13-18, 2013 38th Annual Scientific Meeting of the Society of Interventional Radiology, New Orleans, LA
- “Interventional oncology”
 - “Practice development: Keys to success”

SANDEEP DESHMUKH, M.D.

- August 23, 2012 Department of Radiology Grand Rounds, Pocono Medical Center Tumor Board, East Stroudsburg, PA
- “Effect of new trends in imaging on clinical response evaluation for oncology patients”
- November 25-30, 2012 98th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- “Decreased peristalsis of inflamed small bowel segments identified using cine MR enterography”
 - “Inside out: Revisiting prostate MR without an endorectal coil - Technical aspects and imaging findings” (exhibit)
- November 27, 2012 Department of Radiology Grand Rounds, Our Lady of Lourdes Medical Center, Camden, NJ
- “Current role of MRI in management of hepatocellular carcinoma and the liver imaging and reporting data system (LI-RADS)”
- February 24-
March 1, 2013 Abdominal Radiology Course 2013, sponsored by the Society of Gastrointestinal Radiologists, Maui, HI
- “Functional MR imaging Biomarkers to predict therapeutic response in prostate cancer
- May 21-23, 2013 The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
- “Case studies: Emphasis on multimodality”
 - “Multimodality approach to vascular disease”

DAVID ESCHELMAN, M.D.

- May 9, 2013 Webinar, sponsored by the Melanoma Research Foundation
- “Liver directed therapies”

ADAM FLANDERS, M.D.

- November 25-30, 2012 98th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- “Case-based review of magnetic resonance: Neuroradiology: Spine”
 - “So many images, so little time: Advanced imaging techniques”
 - “Quantitative imaging: A revolution in evolution”
 - “Peer-to-Peer: An integrated PACS based solution for improving compliance with the radiology peer review process”
- February 21-24, 2013 American Society of Spine Radiology 2013 Annual Symposium, Scottsdale, AZ
- “MR grading system of disc degeneration: Useful or just extra work?”
- May 17, 2013 4th Annual Navigating Spinal Care Symposium: management of Thoracolumbar Spine Diseases, sponsored by Thomas Jefferson University Hospital, Philadelphia, PA
- “Controversies in imaging of the thoracolumbar spine”
- May 20-23, 2013 American Society of Neuroradiology 51st Annual Meeting & the Foundation of the ASNR Symposium 2013, San Diego, CA
- “RSNA MIRC teaching files on tablets”
- June 6-9, 2013 The Society for Imaging Informatics in Medicine 2013 Annual Meeting, Dallas, TX
- “Hot topic session. Quantitative imaging: A revolution in evolution”
 - “Reinventing the radiologist educational session: From imaging requisition to image acquisition”
 - “Reinventing the radiologist educational session: From workflow management to adding value through informatics”
 - “Reinventing the radiologist educational session – Town hall session”
 - “Improving compliance with radiology peer-review in the academic setting through point-of-care integration”

FLEMMING FORSBERG, PH.D.

- September 20-21, 2012 27th Annual Advances in Contrast Ultrasound: ICUS Bubble Conference, Chicago, IL
- “4D subharmonic imaging: Initial results”

- October 7-10, 2012 IEEE International Ultrasonics Symposium 2012, Dresden, Germany
- “On the utility of subharmonic microbubble signals to detect portal hypertension” (poster)
 - “Noninvasive right ventricular pressure estimation *in vivo* using the subharmonic emissions from ultrasound contrast agents”
- October 17, 2012 Webinar, sponsored by the North American Center for Continuing Medical Education
- “Utilizing advanced ultrasound technology in women’s health”
 - “Evaluating breast microcalcifications using advanced ultrasound technologies”
- November 25-30, 2012 98th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- “*In vivo* perfusion estimation using 3D subharmonic imaging”
 - “Subharmonic aided pressure estimation in patients with chronic liver disease for the noninvasive estimation of portal pressure”
- April 6-10, 2013 2013 American Institute of Ultrasound in Medicine Annual Convention, New York, NY
- “Effect of targeted ultrasound contrast agent attachment on nonlinear frequency emissions” (eposter)
 - “Correlation of ultrasound contrast agent derived blood flow parameters with immunohistochemical markers in two murine xenografts: Influence of imaging mode, tumor model and subcutaneous location” (eposter)
- May 21-23, 2013 The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
- “2D and 3D CEUS perfusion estimation”
 - “CEUS for liver lesion characterization – A phase III clinical trial in the United States”
 - “Monitoring neoadjuvant chemotherapy with subharmonic pressure estimates”

DAVID FRIEDMAN, M.D.

- October 25-28, 2012 Comprehensive Neuroradiology Review, sponsored by Hospital of the University of Pennsylvania, Philadelphia, PA
- “Infectious diseases of the brain and meninges”
- April 14-19, 2013 2013 American Roentgen Ray Annual Meeting, Washington, DC
- “Variability in study withdrawal rates among academic subspecialty radiologists and general radiologists participating in a utilization management program directed by a radiology benefit management company”

BARRY GOLDBERG, M.D.

- September 20-21, 2012 27th Annual Advances in Contrast Ultrasound: ICUS Bubble Conference, Chicago, IL
- “Phase III liver trials”

CARIN GONSALVES, M.D.

- May 9, 2013 Webinar, sponsored by the Melanoma Research Foundation
- “Radioembolization and chemoembolization for the treatment of uveal melanoma hepatic metastases”

FLAVIUS GUGLIELMO, M.D.

- October 6-10, 2012 Society of Computed Body Tomography & Magnetic Resonance 35th Annual Meeting, Boston, MA
- “Gadolinium contrast agent selection and optimal use for body MR imaging”
- November 25-30, 2012 98th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- “Appropriate gadolinium contrast agent selection for body MR imaging”
- April 28, 2013 Annual Spring Patient Education Day, Philadelphia/Delaware Valley Chapter, Crohn’s and Colitis Foundation of America, Philadelphia, PA
- “Radiology in inflammatory bowel disease”

ETHAN HALPERN, M.D.

- September 5, 2012 Department of Medicine Grand Rounds, Methodist Hospital, Philadelphia, PA
- “Clinical indications for cardiac CT”
- October 11-14, 2012 70th Annual Meeting of the Mid-Atlantic Section of the American Urological Association, Philadelphia, PA
- “Pretreatment with contrast-enhanced transrectal ultrasound for prostate cancer detection: A randomized, double blinded trial”
 - “Shear-wave elastography detection of prostate cancer as compared to conventional transrectal ultrasound”
- October 16, 2012 Department of Radiology Grand Rounds, Bryn Mawr Hospital, Bryn Mawr, PA
- “Renal ultrasound and Doppler”

- October 24-27, 2012 Department of Medicine Grand Rounds, Methodist Hospital, Philadelphia, PA
- “Clinical indications for cardiac CT”
- November 25-30, 2012 98th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- “Contrast-enhanced transrectal ultrasound for the detection of prostate cancer: A randomized, double-blinded trial of dutasteride pretreatment – Final report”
 - “Medical professionalism as it relates to the practice of radiology: Education of medical students and radiology residents”
- March 13, 2013 Department of Radiology Grand Rounds, Hahnemann University Hospital – Drexel University College of Medicine, Philadelphia, PA
- “CTA of coronary anomalies”
- April 30, 2013 Visiting Lecturer, Divisions of Urology and Imaging Sciences, National Institutes of Health, Bethesda, MD
- “Advanced ultrasound for prostate cancer detection and characterization”

CHARLES INTENZO, M.D.

- January 24-27, 2013 American College of Nuclear Medicine 2012 Annual Meeting and SNMMI Mid-Winter Meeting, New Orleans, LA
- “Interobserver agreement of nuclear medicine residents following implementation of the 3-year duration in residency training”
 - “The molecular imaging of invasive breast cancer in nuclear medicine: A pictorial essay” (scientific exhibit)
 - “The spectrum of FDG-PET/CT imaging of adrenal malignancies” (poster)
 - “Utility of FDG-PET/CT in orbital malignancies” (poster)

ALFRED KURTZ, M.D.

- January 11, 2013 Visiting Professor, Department of Radiology, Bryn Mawr Hospital, Bryn Mawr, PA
- “Ultrasound and CT of the Pelvis”
- May 21-23, 2013 The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
- “Ultrasound and CT of the pelvis”

PARAS LAKHANI, M.D.

- November 25-30, 2012 98th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- “Extracting critical test results and communications from reports: Validation and results”
 - “Automatic creation of structured radiology reports using a custom natural language processing solution: Application and feasibility with chest x-ray interpretations” (exhibit)

DAVID LEVIN, M.D.

- September 8, 2012 Visiting Lecturer, Pennsylvania Radiological Society, Philadelphia, PA
- “New radiology practice models that may be in your future – Hospital employment, group mergers, corporate buyouts, buyouts by insurance carriers, bundling and ACOs”
- October 5, 2012 Visiting Lecturer, Society of Chairs of Academic Radiology Departments, Vancouver, BC, Canada
- “Building a radiology research program without relying on NIH funding”
- October 21, 2012 Visiting Lecturer, Ontario Association of Radiologists, Toronto, Ontario, Canada
- “The tendering or outsourcing of diagnostic imaging: Good or bad health care policy?”
- October 25-28, 2012 27th Annual Economics of Diagnostic Imaging 2012: National Symposium, Arlington, VA
- “Threats to the future of radiology and how to respond to them”
 - “Accreditation programs in imaging: Can they work?”
 - “The controversy over the influence of the teleradiology companies on radiologic practice?”
 - “New radiology practice models that may be in your future”
- November 25-30, 2012 98th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- “Coronary CT angiography (CCTA): A strikingly underutilized test in relation to radionuclide myocardial perfusion imaging (MPI)”
 - “How entrepreneurial are radiologists?” (poster)
 - “The sharp reductions in Medicare payments for noninvasive diagnostic imaging in recent years – Will they satisfy the federal policymakers?”
 - “The effect of the U.S. Preventive Services Task Force recommendations on use of screening mammography”
 - “The future of radiology: What are the threats and how to respond to them?”
 - “The effect of code bundling on volumes and rates of cardiac imaging by cardiologists and other nonradiologist physicians: Implications for health policy planning”

- “Did the utilization of percutaneous coronary interventions by cardiologists decrease after publication of the influential COURAGE trial?”
 - “Utilization patterns in chest radiography in the U.S.: 2000-2010” (poster)
 - “The sharp increase in utilization of invasive treatment of peripheral arterial disease attributable to self-referral by surgeons and cardiologists”
 - “Radiologist-hospital relationships: Value-added services of hospital-based radiology groups”
- March 7, 2013 Visiting Lecturer, Philadelphia Roentgen Ray Society, Philadelphia, PA
- “What must radiologists do to preserve and protect the future of the specialty?” (annual oration)
- May 22, 2013 Webinar, sponsored by the American College of Radiology Leadership Institute
- “Self-referral: Scope and implications”
- June 27, 2013 Webinar, sponsored by the American College of Radiology Leadership Institute
- “Changing the culture: How to assure a good future for radiology (and radiologists)”

JI-BIN LIU, M.D.

- November 25-30, 2012 98th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- “Detection of secondary lymph nodes with contrast-enhanced ultrasound imaging (CEUS)”
- December 1, 2012 Visiting Lecturer, Shanxi Ultrasound Doctor Association, Taiyuan, Shanxi, China
- “Breast ultrasound imaging: Present and future”
- February 23, 2013 The Drexel-Jefferson Academic Alliance Course for Biomedical Engineering, Philadelphia, PA
- “Interventional and intraoperative ultrasound: A review”
 - “Laparoscopic ultrasound”
- April 5-7, 2013 The 7th Chinese Academic Ultrasound Congress, Beijing, China
- “Intraoperative ultrasound: Present and future”
 - “Sonohysterography: Technique and applications”
- May 31, 2013 Ultrasound Symposium, Suzhou, China
- “Intraoperative ultrasound: Present and future”
- June 1, 2013 Visiting Professor, Department of Radiology, First Affiliated Hospital of Zhejiang University, Hongzhou, China
- “Present and prospect of ultrasound technology”
 - “Sonohysterography: A review”

SUZANNE LONG, M.D.

- March 20-24, 2013 Fundamentals of Musculoskeletal Ultrasound, sponsored by University of Michigan Health System, San Diego, CA
- “Elbow ultrasound“
 - “Interventions in the elbow, wrist and hand”
- April 6-10, 2013 2013 American Institute of Ultrasound in Medicine Annual Convention, New York, NY
- “Ultrasound guided procedures in the hand and wrist”
- May 21-23, 2013 The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
- “Musculoskeletal ultrasound: Foot and ankle”
 - “Musculoskeletal ultrasound: Elbow”

ANDREJ LYSHCHIK, M.D., PH.D.

- April 6-10, 2013 2013 American Institute of Ultrasound in Medicine Annual Convention, New York, NY
- “Contrast ultrasound evaluation of tumor response”
 - “Thyroid elastography”
- May 21-23, 2013 The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
- “Contrast ultrasound evaluation of tumor response”

CHRISTOPHER MERRITT, M.D.

- April 6-10, 2013 2013 American Institute of Ultrasound in Medicine Annual Convention, New York, NY
- “Understanding Doppler images”
- May 21-23, 2013 The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
- “Physics”
 - “BIRADS lexicon – Diagnostic criteria”
 - “Vascular injuries”
 - “Safety and risk management”

DONALD MITCHELL, M.D.

- October 6-10, 2012 Society of Computed Body Tomography & Magnetic Resonance 35th Annual Meeting, Boston, MA
- “Incorporating multiple MRI contrast agents into clinical practice – Roundtable table discussion”
 - “Cirrhosis and HCC: Reporting using LIRADS”

- March 21, 2013 Visiting Professor, Department of Radiology, University of Texas at Galveston, Galveston, TX
- “Body MRI cases”
 - “Cirrhosis and HCC: Reporting using LIRADS”
- April 14-19, 2013 2013 American Roentgen Ray Annual Meeting, Washington, DC
- “MRI of cirrhosis, including liver imaging reporting and data system
- April 20-26, 2013 ISMRM 2013: International Society for Magnetic Resonance in Medicine 21st Scientific Meeting & Exhibition, Salt Lake City, UT
- “Body MRI artifacts: A game show – Case-based teaching”

WILLIAM MORRISON, M.D.

- August 26-29, 2012 21st Annual Current Issues of Magnetic Resonance Imaging in Orthopaedics and Sports Medicine, San Francisco, CA
- “How I approach the upper extremity”
 - “Lower extremity osteomyelitis”
 - “Ankle and foot” (panel discussion)
 - “How I approach the lower extremity – Knee”
- September 12-15, 2012 2012 International Skeletal Society Annual Meeting, Rome, Italy
- “Unifying principles in MSK radiology”
- October 4, 2012 American Institute for Radiologic Pathology, Silver Spring, MD
- “MRI imaging of the elbow”
- October 18-20, 2012 7th Annual Musculoskeletal MRI in Clinical Practice 2012, Las Vegas, NV
- “MR arthrography”
 - “Ulnar-sided wrist pain – Radiologist perspective”
 - “Wrist instability – Radiologist perspective”
 - “Osteonecrosis and marrow diseases – Radiologist perspective”
 - “Introduction to MRI of the hips: Protocols, bone trauma, AVN, labral tears, FAI”
 - “Athletic injuries of the foot and ankle”
- February 22-24, 2013 Musculoskeletal MR, American College of Radiology, Reston, VA
- “Cruciate and collateral ligaments”
 - “Ankle: Tendons and ligaments”
 - “Ankle: Bones and joints”
- April 2-6, 2013 45th International Diagnostic Course Davos (IDKD), Davos, Switzerland
- “MRI of the hip and groin”
- April 9, 2013 American Institute for Radiologic Pathology, Silver Spring, MD
- “MRI imaging of the elbow”

- April 20-26, 2013 ISMRM 2013: International Society for Magnetic Resonance in Medicine 21st Scientific Meeting & Exhibition, Salt Lake City, UT
- “Use of dynamic contrast-enhanced MRI in musculoskeletal imaging”
- May 9-11, 2013 Musculoskeletal MR, Education Center Course, American College of Radiology, Reston, VA
- “Cruciate and collateral ligaments”
 - “Ankle: Tendons and ligaments”
 - “Ankle: Bones and joints”
- May 13-15, 2013 Imaging Update Hawaii 2013, Honolulu, HI
- “Unifying principles in MSK radiology”
 - “MRI of the hip”
 - “MRI of spine infection and differential diagnosis”
 - “Post-operative shoulder – A multimodality approach”
 - “MRI of cartilage”
 - “MDCT of the MSK system”
- June 20-22, 2013 American College of Radiology Annual MRI Conference 2013 – MRI from Head to Toe, San Francisco, CA
- “Shoulder impingement syndromes”
 - “Cruciate and collateral ligaments of the knee”
 - “Ankle ligament and impingement syndromes”

LEVON N. NAZARIAN, M.D.

- July 19-21, 2012 Diagnostic and Interventional Musculoskeletal Ultrasound, American Institute of Ultrasound in Medicine and Mayo Clinic, Rochester, MN
- “Introduction to MSK US: Normal, abnormal and common artifacts”
 - “Problem solving in the postoperative hip”
- September 24, 2012 Department of Physical Medicine and Rehabilitation Grand Rounds, John Hopkins University School of Medicine, Baltimore, MD
- “Overview of musculoskeletal ultrasound”
- October 3-5, 2012 New York Roentgen Society 2012 “100th Anniversary” Annual Meeting, New York, NY
- “Practical applications of musculoskeletal ultrasound”
- October 26-28, 2012 22nd Annual Meeting and Postgraduate Course, Society of Radiologists in Ultrasound, Baltimore, MD
- “Sonography of lateral hip pain and the myth of greater trochanteric bursitis”
- November 9, 2012 Visiting Lecturer, New England Roentgen Ray Society, Boston, MA
- “US-guided musculoskeletal interventions”

- November 11-12, 2012 Ultrasound First Forum, American Institute of Ultrasound in Medicine, New York, NY
- “Ultrasound first in sports medicine”
- November 25-30, 2012 98th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- “Image Interpretation” (expert panel)
- December 6-7, 2012 Visiting Professor, Department of Radiology, University of Texas Southwestern Medical Center, Dallas, TX
- “Diagnostic and interventional musculoskeletal ultrasound”
 - “Ultrasound of liver and kidney transplants”
- January 17-20, 2013 Advanced Musculoskeletal Ultrasound/Cadaver Course and Inaugural RMSk Board Review, Andrews Research and Education Institute, Gulf Breeze, FL
- “Sonography of the post-operative rotator cuff”
 - “Sonography of tendinopathy of the ankle”
 - “Sonography of Morton’s neuroma”
 - “Interventional sonography of the foot and ankle”
 - “Dynamic sonographic imaging of the elbow”
 - “Sonographic anatomy of the shoulder”
 - “Sonography of soft tissue pathology”
 - “Ultrasound-guided musculoskeletal treatments”
- February 27-
March 1, 2013 40th Annual Course in Electrodiagnostic Medicine, sponsored by Thomas Jefferson University Hospital, Philadelphia, PA
- “Ultrasound in neuropathies: Showing how it explains the symptoms and signs”
- April 6-10, 2013 2013 American Institute of Ultrasound in Medicine Annual Convention, New York, NY
- “Dry needling of tendons”
 - “How to be an effective manuscript reviewer for the *Journal of Ultrasound in Medicine*”
 - “Sonography of abdominal wall hernias”
- April 14-19, 2013 2013 American Roentgen Ray Annual Meeting, Washington, DC
- “Musculoskeletal ultrasound applications in the upper extremity”
- April 18, 2013 2013 American Chiropractic Board of Sports Physicians Chiropractic Sports Sciences Symposium, Colorado Springs, CO
- “The role of diagnostic ultrasound in the identification, evaluation, and treatment of sports-related injuries”
- May 21-23, 2013 The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
- “Musculoskeletal Ultrasound Course” (director)
 - “Overview of musculoskeletal ultrasound”
 - “Ultrasound of the shoulder: Pathology”
 - “Ultrasound of the hand and wrist”
 - “Ultrasound of soft tissue masses”

- “Interventional MSK ultrasound”

LAURENCE NEEDLEMAN, M.D.

- September 7-8, 2012 Registered Physician in Vascular Interpretation Exam Review Course, Society of Vascular Ultrasound and the University of Cincinnati, Dallas, TX
- “Interpretation guidelines: Arterial duplex ultrasound”
 - “Case interpretation: Arterial duplex ultrasound”
 - “Interpretation guidelines: Arterial physiologic testing”
 - “Case interpretation: Arterial physiologic testing”
 - “Interpretation guidelines: Extracranial cerebrovascular”
 - “Case interpretation: Cerebrovascular”
- October 26-28, 2012 22nd Annual Meeting & Postgraduate Course of the Society of Radiologists in Ultrasound, Chicago, IL
- “The future of ultrasound contrast in the USA, or why I love the FDA”
 - “Sonographic evaluation of lower extremity pain – Beyond DVT”
- November 16-17, 2012 Advances in Vascular Imaging and Diagnosis 23rd Annual Symposium and Workshop on Management and Clinical Issues, sponsored by Cleveland Clinic, New York, NY
- “AAA screening: Who should be screened and how to do it”
 - “Advanced venous, arterial and physiologic testing interpretation”
 - “More on report writing”
 - “Key words at key times: Report writing strategies: What’s the best way to say what needs to be said: 4 case study presentations”
 - “Evidence based venous ultrasound”
 - “Venous thrombosis: Acute, chronic, recurrent”
- January 20-24, 2013 2013 International Symposium on Endovascular Therapy, Miami, FL
- “Carotid artery stenosis commentary: Are any criteria good enough”
 - “QA panel on carotid duplex”
 - “Controversial topics in venous Duplex evaluation: Current ACCP recommendations and value of bilateral exams in patients with unilateral symptoms”
 - “Commentary on venous controversies”
- March 8-9, 2013 Registered Physician in Vascular Interpretation Exam Review Course, Society of Vascular Ultrasound and the University of Cincinnati, Tampa, FL
- “Case interpretation guidelines: Arterial duplex ultrasound”
 - “Interpretation guidelines: Arterial physiologic testing”
 - “Case interpretation guidelines: Arterial physiologic testing”
 - “Interpretation guidelines abdominal vascular: Aortic, visceral, renal, hepato-portal”
 - “Case interpretation examples abdominal vascular: Aortic, visceral, renal, hepato-portal”

- March 16-17, 2013 22nd Annual State of the Art Vascular Ultrasound, Medical Technology Management Institute, Milwaukee, WI
- “Doppler waveforms and artifacts”
 - “Carotid arteries: Stenoses and stents”
 - “Doppler of the lower extremity veins”
 - “Doppler jeopardy”
 - “Doppler of the lower extremity arteries”
- April 6-10, 2013 2013 American Institute of Ultrasound in Medicine Annual Convention, New York, NY
- “Understanding Doppler images and quality control of image acquisition”
- April 10-13, 2013 St. Louis Vascular Symposium, The 18th Edition, sponsored by Mercer Heart and Vascular Hospital, St. Louis, MO
- “Carotid duplex criteria: Consensus or chaos”
 - “From worksheet to report”
- May 21-23, 2013 The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
- “The best diagnostic criteria ever: A review”
 - “Q&A and carotid case analysis emphasizing quality assurance and diagnostic criteria”
 - “Vascular ultrasound case studies review”

VIJAY RAO, M.D.

- November 25-30, 2012 98th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- “Teaching leadership strategies to residents for future health care challenges”
 - “Health service, policy & research (economic analyses/utilities) the future of radiology: What are the threats and how to respond to them”
 - “The future of radiology: what are the threats and how to respond to them”
- March 14, 2013 Visiting Professor, Department of Radiology, State University College of Human Medicine for Spectrum Health Butterworth Hospital, Grand Rapids, MI
- Case presentations
- March 14, 2013 77th Annual Preston M. Hickey Lecturer, Michigan Radiological Society, Novi, MI
- “Hospital-radiologist relations”
- April 9-12, 2013 Association of University Radiologists 61st Annual Meetomg, Los Angeles, CA
- “Value based leadership”

- April 10-11, 2013 AUR-AGFA Radiology Management Program, Los Angeles, CA
- “RBMs – How do they control utilization: The Jefferson experience”
- May 2-5, 2013 14th Congress of the World Congress of Ultrasound in Medicine and Biology and 16th Congress of the Latin American Federation of Ultrasound 43rd Sao Paulo Radiology Meeting, Sao Paulo, Brazil
- “Sinus inflammatory and FESS”
 - “Postoperative sinus imaging”

CHRISOPHER ROTH, M.D.

- April 14-19, 2013 2013 American Roentgen Ray Annual Meeting, Washington, DC
- “RVU productivity comparison between private practice radiology workflow and academic radiology workflow models”

DINESH SHARMA, M.D.

- January 4-7, 2013 66th Annual Conference of Indian Radiological & Imaging Association, Indore, India
- “Identifying ischemic strokes in non-contrast CT, CTA and CTP”
 - “Quantifying strokes for therapy and ASPECT scoring”
- April 3, 2013 Department of Medicine Grand Rounds, Methodist ospital, Philadelphia, PA
- “Imaging evaluation of acute ischemic strokes

LISA TARTAGLINO, M.D.

- March 7-8, 2013 12th Annual Cerebrovascular Update, sponsored by Thomas Jefferson University Hospital, Philadelphia, PA
- “Modern imaging approaches in stroke management

MATHEW THAKUR, PH.D

- August 27-29, 2012 Visiting Lecturer, NuView, Inc., Salt Lake City, UT
- “Targeting VPAC1 genomic biomarkers for PET/PEM imaging of breast cancer”
- September 5-8, 2012 2012 World Molecular Imaging Congress, Dublin, Ireland
- “Synthesis and critical evaluation of a peptide – NIR fluorophore – conjugate biomarker for imaging breast cancer”
- September 15, 2012 Visiting Lecturer, United Pharmacy Partners, Inc. ,Philadelphia, PA
- “Targeting genomic biomarkers for oncologic imaging”

- September 27, 2012 Visiting Lecturer, National Institutes of Health, Bethesda, MD
- “Radiolabeled blood cells: imaging infection”
- November 1, 2012 Visiting Lecturer, Department of Pathology, Yale University, New Haven, CT
- “Molecular imaging: From bench to bedside”
- November 8, 2012 Visiting Lecturer, ImaginAb, Inc., Los Angeles, CA
- “Targeting CD 15 receptors for imaging infection”
- February 28-
March 2, 2013 2nd World Congress on Ga-68 (Generators and Novel Radiopharmaceuticals), Molecular Imaging (PET/CT), Targeted Radionuclide Therapy and Dosimetry: On the Way to Personalized Medicine, Chandigarh, India
- “Can Ga-68 contribute to the welfare of women suspected to have breast cancer?”
- March 11, 2013 Visiting Lecturer, Bruckner, Inc. Training Course at Princeton University, Princeton, NJ
- “Molecular imaging: From bench to bedside”
- March 21-23, 2013 16th Biannual International Society of Radiolabeled Blood Elements Conference, Pretoria, South Africa
- “Stem cells; a regenerative pharmaceutical”
 - “Highlights of the 14th International Conference of International Society of Radiolabeled Blood Elements (ISORBE)”
- March 22, 2013 Visiting Lecturer, University City Science Center, Philadelphia, PA
- “Imaging genomic biomarkers for diagnosis and therapy”
- June 8-12, 2013 Society of Nuclear Medicine and Molecular Imaging 2013 Annual Meeting, Vancouver, BC, Canada
- “Gene based detection of genitourinary cancer cells”
 - “Imaging of KRAS2-activated early onset lung cancer in transgenic mice”
 - “Ex vivo evaluation of Cu-64-TP3805 for imaging prostate cancer”
 - “Remembering Henry Wagner, Jr.”

ANNINA WILKES, M.D.

- May 21-23, 2013 The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
- “Breast ultrasound –Technique and normal anatomy”
 - “Ultrasound guided percutaneous breast biopsy”

ADAM ZOGA, M.D.

- August 24-25, 2012 Musculoskeletal Cross Sectional Imaging 2012, Heidelberg Summer School, Heidelberg, Germany
- “MRI of athletic pubalgia”
- August 26-29, 2012 21st Annual Current Issues of Magnetic Resonance Imaging in Orthopaedics and Sports Medicine, San Francisco, CA
- “MR of the hip: AVN, muscle, tendon and labrum”
 - “Imaging of athletic pubalgia and sports hernias”
 - “How I take a hip MRI”
 - “Hip” (panel discussion)
- October 6, 2012 Rothman Institute’s 3rd Annual Evidence Based Orthopaedics Imaging Evaluation of Orthopaedic Lesions, Philadelphia, PA
- “State of the art orthopaedic imaging in 2012”
- February 15, 2013 Department of Radiology Grand Rounds, Fletcher Allen Healthcare, University of Vermont Medical Center, Burlington, VT
- “Hip imaging in 2013” (resident conference)
 - “Knee MRI nuances and nuisances”
- February 24-27, 2013 Edusymp Musculoskeletal MRI, Snowmass, CO
- “SLAP happy: When and how to call a SLAP lesion on MRI”
 - “MRI of the hip”
 - “Knee MR nuances and nuisances”
 - “Pre and post-op cruciates”
- March 17-20, 2013 2013 Society of Skeletal Radiology Annual Meeting, San Antonio, TX
- “Imaging and postoperative lower extremity” (SAM coordinator and moderator)
 - “Imaging the postoperative hip and pelvis”
 - “Is there an association between psoas atrophy and prior hip surgery in patients with recurrent groin pain?” (poster)
- April 14-19, 2013 2013 American Roentgen Ray Annual Meeting, Washington, DC
- “Sports specific imaging considerations” (instructional course)
- April 20-26, 2013 ISMRM 2013: International Society for Magnetic Resonance in Medicine 21st Scientific Meeting & Exhibition, Salt Lake City, UT
- “Athletic pubalgia: The sportsman’s ‘non-hernia’”

APPENDIX III

HONORS, EDITORIAL ACTIVITIES, SERVICE TO REGIONAL OR NATIONAL ORGANIZATIONS

OKSANA BALTAROWICH, M.D.

- Vice President, Ukrainian Medical Association of North America, Pennsylvania Chapter
- Member, Committee for Revision of American College of Radiology Guidelines on Pelvic Sonography, Society of Radiologists in Ultrasound and American College of Radiology
- Member, Training and Outreach Committee, Society of Radiologists in Ultrasound
- Member, Human Resources Committee, Ultrasound, American College of Radiology
- Member, Advisory Board, Health Help/Rad Consult)

DANIEL BROWN, M.D.

- Chair, Workshop Program, Annual Meeting Committee, Society of Interventional Radiology
- Chair, Endorsement/Joint-Sponsorship Subcommittee, Society of Interventional Radiology
- Scientific Chair, Annual Scientific Meeting Committee, Society of Interventional Radiology
- Member, Editorial Board, *Seminars in Interventional Radiology*
- Guest Editor, Liver Malignancies Edition, *Seminars in Interventional Radiology*
- Reviewer, Abstracts/Posters, The 5th Annual Symposium on Clinical Interventional Oncology
- Honorary Member, Alpha Omega Alpha, Alpha, Philadelphia Chapter
- Named as one of the “America’s Best Doctors”
- Named as one of the “America’s Top Doctors for Cancer”

MARK COOPER, M.D.

- Member, Managed Care Committee, American College of Radiology

SANDEEP DESHMUKH, M.D.

- Member, Board of Directors, Pennsylvania Radiological Society
- Reviewer, *Journal of Magnetic Resonance Imaging*
- Reviewer, *Academic Radiology*
- Reviewer, *European Radiology*
- Editor’s Certificate of Recognition, Distinguished Reviewer, *Journal of Magnetic Resonance Imaging*

DAVID ESCHELMAN, M.D.

- Dr. David J. Eschelman Grant for Ocular Melanoma Research, Melanoma Research Foundation
- Faculty Team Achievement Award for Collaborative Work as a Member of the Metastatic Uveal Melanoma Team, Jefferson Medical College

RICK FELD, M.D.

- Member, Ultrasound Committee, Core Certifying Examination, American Board of Radiology
- Member, Education Program Committee, Philadelphia Roentgen Ray Society
- Subspecialty Editor, *Journal of Ultrasound in Medicine*
- Reviewer, *Clinical Imaging*
- Reviewer, *Journal of American Medical Association*
- Reviewer, *Journal of Ultrasound in Medicine*
- Reviewer, *Journal of Ultrasound in Medicine and Biology*

ADAM FLANDERS, M.D.

- President Elect, American Society of Spine Radiology
- Fellow Elect, College of Fellows, Society of Imaging Informatics in Medicine
- Chair, Subcommittee for Digital Outreach, Informatics Committee, American College of Radiology
- Chair, Neuroradiology Subcommittee, Reporting Committee, Radiological Society of North America
- Chair, Rules Committee, American Society of Neuroradiology
- Chair, Radiology Informatics Committee, Radiological Society of North America
- Chair, Neuroradiology/ENT Subcommittee, RadLex Committee, Radiological Society of North America
- Chair, Ad Hoc Informatics Committee, American Society of Spine Radiology\
- Member, Informatics Committee, American College of Radiology
- Member, Educational Council, Radiological Society of North America
- Member, Publications Council, Radiological Society of North America
- Member, Radiology Informatics Subcommittee for Educational Exhibits, Radiological Society of North America
- Member, Program Committee, Society for Imaging Informatics in Medicine
- Member, Program Committee, American Society of Neuroradiology
- Member, Nominating Committee, American Society of Spine Radiology
- Member, Computer Sciences and Information Committee, American Society of Neuroradiology
- Member, Education Committee, American Society of Neuroradiology
- Member, Synaptic Junction Education Subcommittee, American Society of Neuroradiology
- Member, Evidence Based Medicine Committee, American Society of Neuroradiology
- Member, Executive Committee, American Society of Neuroradiology
- Member, Technical Exhibits Committee, American Society of Neuroradiology
- Associate Editor, *Neurographics*
- Reviewer, Grants, Craig H. Nielsen Foundation for Spinal Cord Injury
- Imaging Co-Editor, *Yearbook in Ophthalmology*

- Reviewer, Abstracts, Annual Meeting, Radiological Society of North America
- Reviewer, Abstracts, Annual Meeting, American Society of Neuroradiology
- Reviewer, Abstracts, Annual Symposium, American Society of Spine Radiology
- Reviewer, *American Journal of Neuroradiology*
- Reviewer, *Journal of Digital Imaging*
- Reviewer, *The New England Journal of Medicine*
- Reviewer, *Radiographics*
- Reviewer, *Radiology*

FLEMMING FORSBERG, PH.D.

- Deputy Editor, Basic Science, *Journal of Ultrasound in Medicine*
- Senior Member, Institute of Electrical and Electronics Engineers
- Member, Advisory Editorial Board, *Ultrasound in Medicine and Biology*
- Member, Advisory Editorial Board, *Journal of Ultrasound in Medicine*
- Member, Editorial Board, *Ultrasound Imaging*
- Reviewer, Grants, National Institutes of Health
- Reviewer, Grants, Research & Education Foundation, Radiological Society of North America
- Reviewer, *Acoustic Research Letters Online*
- Reviewer, *Circulation*
- Reviewer, *IEEE Transactions on Ultrasonics, Ferroelectrics & Frequency Control*
- Reviewer, *IEEE Transactions on Medical Imaging*
- Reviewer, *International Journal of Cancer*
- Reviewer, *Journal of Ultrasound in Medicine*
- Reviewer, *Medical Engineering & Physics*
- Reviewer, *Medical Physics*
- Reviewer, *Radiology*
- Reviewer, *Ultrasonics*
- Reviewer, *Ultrasonic Imaging*
- Reviewer, *Ultrasound in Medicine and Biology*
- Reviewer, *Veterinary Radiology & Ultrasound*

DAVID FRIEDMAN, M.D.

- Reviewer, *American Journal of Neuroradiology*
- Reviewer, *American Journal of Roentgenology*
- Reviewer, *Journal of the American College of Radiology*

GEOFFREY GARDINER, JR, M.D.

- Reviewer, *American Journal of Neuroradiology*
- Named as one of the “America’s Best Doctors”

ERIC GINGOLD, PH.D.

- Chair, Radiography/Fluoroscopy Subcommittee, American Association of Physicists in Medicine
- Co-chair, Physics Education Task Force, Radiological Society of North America/ American Association of Physicists in Medicine
- Co-chair, Physics Education Task Force Subcommittee, American Association of Physicists in Medicine
- Co-Chair, Pennsylvania State Unit of Medical Physics Licensure and Regulatory Recognition Subcommittee, American Association of Physicists in Medicine
- Director, Imaging Education Program, Annual Meeting, American Association of Physicists in Medicine
- Member, Imaging Physics Committee, American Association of Physicists in Medicine
- Leader, Task Group 150, Imaging Receptor Subgroup, Acceptance Testing and Quality Control of Digital Radiograph Systems, American Association of Physicists in Medicine
- Member, Medical Physics Education of Physicians Committee, American Association of Physicists in Medicine
- Member, Medical Physics Education of Allied Health Professionals Committee, American Association of Physicists in Medicine
- Member, Limited Scope X-ray Operator Exam Committee, American Registry of Radiologic Technologists
- Member, Committee on Government Relations – Medical Physics, American College of Radiology
- Member, Certifying Exam Committee, American Board of Radiology
- Ad hoc Associate Editor, *Medical Physics*
- Reviewer, *Medical Physics*
- Reviewer, *Radiology*

BARRY GOLDBERG, M.D.

- Co-President, International Contrast Ultrasound Society
- Chairman, Archives Committee, American Institute of Ultrasound in Medicine
- Chairman, Archives Committee, World Federation for Ultrasound in Medicine and Biology
- Chairman, Committee on Ultrasound, American College of Radiology Imaging Network
- Chair, Education Committee, World Federation for Ultrasound in Medicine and Biology
- Chair, Ultrasound Working Group, American College of Radiology Imaging Network
- Councilor, World Federation for Ultrasound in Medicine and Biology
- Member, Administrative Council, World Federation for Ultrasound in Medicine and Biology
- Member, Awards Committee, American Institute of Ultrasound in Medicine
- Member, Public Information Advisory Board, Radiological Society of North America
- Member, Outstanding Researcher Award Review Panel, Research and Education Foundation, Radiological Society of North America
- Member, Past Presidents Committee, American Institute of Ultrasound in Medicine
- Member, Outstanding Researcher Award Review Panel, Research and Education Foundation, Radiological Society of North America
- Member, Public Information Advisors Network, Radiological Society of North America
- Member, Corporate Advisory Council, Radiological Society of North America
- Member, Presidential Advisory Council, American Institute of Ultrasound in Medicine
- Member, Education Council, Radiological Society of North America

- Member, Endowment for Education and Research Committee, American Institute of Ultrasound in Medicine
- Member, Committee on International Service, American College of Radiology
- Member, Contrast Agents Panel, American Institute of Ultrasound in Medicine
- Member, Advisory Committee on Ultrasound in Developing Countries, Society of Radiologists in Ultrasound
- Member, International Outreach Committee, American College of Radiology Foundation
- Member, Administrative Council, World Federation for Ultrasound in Medicine and Biology
- Member, Research and Education Fund Committee, American Institute of Ultrasound in Medicine
- Member, Ultrasound Shear Wave Speed Technical Committee, Quantitative Imaging Biomarker Alliance, Radiological Society of North America
- Member, Ultrasound Shear Wave Speed Clinical Application Subcommittee, Quantitative Imaging Biomarker Alliance, Radiological Society of North America
- Founding Member, International Contrast Ultrasound Society
- Honorary Member, Mexican Association of Ultrasound in Medicine
- Honorary Member, Australasian Society for Ultrasound in Medicine
- Honorary Member, America Nepal Medical Foundation
- Medical Advisor, Ultrasonic Procedures, Blue Shield of Pennsylvania
- Consultant, United States – Israel Binational Science Foundation
- Consultant, Ultrasound, Philadelphia Zoo, Philadelphia, Pennsylvania
- Professional Consultant, Medicare, Pennsylvania Blue Shield
- Medical Advisor, Ultrasound, World Health Organization
- Coordinator, Ultrasonography, Topics in Radiology, *Journal of American Medical Association*
- Associate Editor, *Journal of Ultrasound in Medicine*
- Associate Editor, *Surgical Endoscopy, Ultrasound, and Interventional Techniques*
- Editorial Advisor, *Journal d'Echographie et de Medecine par Ultrasons*
- Overseas Editorial Adviser, *Borno Medical Journal*
- Editorial Consultant, *Applied Radiology*
- Editorial Consultant, *Chest*
- Editorial Consultant, *Medcom Faculty of Medicine*
- Editorial Consultant, *Pediatrics*
- Member, Advisory Committee, *Ultrasonidos en Medicina*
- Member, Editorial Advisory Board, *West African Journal of Ultrasound*
- Member, Advisory Editorial Board, *Ultrasound in Medicine and Biology*
- Member, Editorial Committee, *Journal Ultrasonido*
- Member, Editorial Board, *Advances in Echo Enhancement*
- Member, Editorial Board, *Archives of Clinical Imaging*
- Member, Editorial Board, *Clinics in Diagnostic Ultrasound*
- Member, Editorial Board, *Journal d'Echographie et de Medecine Ultrasonore*
- Member, Editorial Board, *Journal of Clinical Ultrasound in Medicine*
- Member, Editorial Board, *Journal of Surgical Ultrasonology*
- Member, Editorial Board, *Journal of Ultrasound in Medicine*
- Member, Editorial Board, *Journal of Ultrasound in Medicine and Biology*
- Member, Editorial Board, *Radiologia*
- Member, Editorial Board, *Ultrasound International*
- Member, Editorial Board, *Ultrasound International Journal*
- Member, Editorial Board Committee, *Acta Clinica Croatica*
- Member, International Advisory Editorial Board, *Hungarian Radiology*
- Member, International Editorial Board, *Giornale Italiano di Ecografia Journal*
- Member, International Editorial Board, *Brazilian Radiology Journal*

- Member, International Consultant Committee, *Revista Argentina de Radiologia*
- Member, International Advisory Board, *Indian Journal of Medical Ultrasound*
- Member, International Advisory Board, *Turkish Journal of Diagnostic and Interventional Radiology*
- Member, International Liaison Committee, *Ultrasound in Medicine and Biology*
- Reviewer, *American Journal of Roentgenology*
- Reviewer, *Cancer*
- Reviewer, *Gastroenterology*
- Reviewer, *Gastrointestinal Endoscopy*
- Reviewer, *Health Devices*
- Reviewer, *Journal of the National Cancer Institute*
- Reviewer, *Radiology*
- Reviewer, *The New England Journal of Medicine*
- Expert Panelist, AuntMinnie.com

CARIN GONSALVES, M.D.

- Reviewer, *Journal of Vascular and Interventional Radiology*
- Faculty Team Achievement Award for Collaborative Work as a Member of the Metastatic Uveal Melanoma Team, Jefferson Medical College

RICHARD GORNIK, M.D.

- Reviewer, *Radiographics*
- Reviewer, *Epilepsia*

ETHAN HALPERN, M.D.

- Member, Task Force to Update Guidelines for Prostate Sonography, American College of Radiology
- Member, Public Information Advisors Network, Radiological Society of North America
- Associate Editor, *Academic Radiology*
- Associate Editor, *Radiology*
- Reviewer, *Academic Radiology*
- Reviewer, *American Journal of Roentgenology*
- Reviewer, *Annals of Internal Medicine*
- Reviewer, *Radiology*

ELIZABETH HSU, M.D.

- Dean's Award for Excellence in Education, Jefferson Medical College, 2013

CHARLES INTENZO, M.D.

- Member, Academic Council, Society of Nuclear Medicine
- Member, Nuclear Medicine Program Directors, Society of Nuclear Medicine
- Member, Oncology Council, Society of Nuclear Medicine

- Member, Therapy Council, Society of Nuclear Medicine
- Reviewer, *International Journal of Molecular Imaging*
- Reviewer, *Journal of the American Roentgen Ray Society*
- Reviewer, *Journal of Gastrointestinal Cancer*
- Reviewer, *Radiographics*
- Reviewer, *Radiology*

DAVID KARASICK, M.D.

- Reviewer, *American Journal of Roentgenology*
- Reviewer, *Skeletal Radiology*
- Reviewer, *Radiology*

STEPHEN KARASICK, M.D.

- Reviewer, *American Journal of Roentgenology*

SUNG KIM, M.D.

- Member, Executive Council, Program Development Education Funding, Society of Nuclear Medicine
- Member, Computer and Instrument Council, Society of Nuclear Medicine
- Member, Brain Imaging Council, Society of Nuclear Medicine
- Member, Correlative Imaging Council, Society Nuclear Medicine
- Member, Membership Committee, Society of Nuclear Medicine
- Reviewer, Nuclear Medicine Subcommittee, Education Exhibit Committee, Radiological Society of North America
- Reviewer, *Journal of Nuclear Medicine*

ALFRED KURTZ, M.D.

- Member, Research Committee, Society of Radiologists in Ultrasound
- Member, Editorial Advisory Board, *Diagnostico Journal*
- Reviewer, *Radiographics*

PARAS LAKHANI, M.D.

- Member, Structured Reporting Subcommittee, Radiology Society of North America
- Reviewer, *Journal of Digital Imaging*
- Reviewer, *Radiographics*
- Most Downloaded Paper in 2012 Award, *Journal of Digital Imaging*: Shih G, Lakhani P, Nagy P: Is Android or iPhone the platform for innovation in imaging informatics. *J Digit Imaging* 2012; 23(1).

DAVID LEVIN, M.D.

- Annual Oration Lecture, Philadelphia Roentgen Ray Society
- Campaign Chair, Research and Education Foundation Centennial Campaign, Radiological Society of North America
- Co-Chair, Future Trends Committee, American College of Radiology
- Member, Commission on Economics, American College of Radiology
- Member, Committee on Radiologist Resources, American College of Radiology
- Member, Media Spokesperson Group, American College of Radiology
- Member, Committee on Evidence-Based Benefits Design, National Business Group on Health
- Member, Public Information Advisory Network, Radiological Society of North America
- Member, Committee on Radiology Integrated Care Networks, American College of Radiology
- Member, Health Services Policy & Research Subcommittee, Scientific Program Committee, Radiological Society of North America
- Reviewer, *Journal of the American College of Radiology*
- Reviewer, *American Journal of Roentgenology*
- Reviewer, *Radiology*
- Best Article Award, Health Services Research and Policy Category, *Journal of the American College of Radiology*
- Exceptional Manuscript Reviewer Award, *Journal of the American College of Radiology*

JI-BIN LIU, M.D.

- Member, Medical Advisory Board, International Certification and Education Accreditation Foundation
- Member, Editorial Board, *Chinese Journal of Medical Imaging Technology*
- Member, Editorial Board, *Journal of Ultrasound in Clinical Medicine*
- Reviewer, Grants, National Natural Science Foundation of China
- Reviewer, *Academic Radiology*
- Reviewer, *CardioVascular and Interventional Radiology*
- Reviewer, *Chinese Journal of Ultrasonography*
- Reviewer, *Journal of Clinical Ultrasound*
- Reviewer, *Journal of Ultrasound in Medicine*
- Reviewer, *Ultrasonics*
- Reviewer, *Ultrasound in Medicine and Biology*
- Distinguished Reviewer Award, *Journal of Ultrasound in Medicine*
- Contribution Award, Chinese Ultrasound Doctor Association

SUZANNE LONG, M.D.

- Reviewer, *Clinical Radiology*
- Reviewer, *Journal of Ultrasound in Medicine*
- Distinguished Reviewer Award, *Journal of Ultrasound in Medicine*, 2013

ANDREJ LYSHCHIK, M.D., PH.D.

- Secretary, Contrast-Enhanced Ultrasound Community, American Institute of Ultrasound in Medicine.
- Member, Advisory Editorial Board, *Journal of Ultrasound in Medicine*
- Reviewer, *Ultrasound in Medicine and Biology*
- Reviewer, *Journal of Ultrasound in Medicine*
- Reviewer, *European Radiology*
- Reviewer, *European Journal of Nuclear Medicine and Molecular Imaging*
- Reviewer, *European Journal of Radiology*

CHRISTOPHER MERRITT, M.D.

- Member, Strategic Planning Committee, College of Physicians
- Member, Committee on Administration, College of Physicians
- Member, Ultrasound Curriculum Committee, Society of Radiologists in Ultrasound
- Contributing Editor, *Breast Diseases Quarterly*
- Member, International Advisory Board, *Turkish Journal of Diagnostic and Interventional Radiology*
- Reviewer, *American Journal of Roentgenology*

DONALD MITCHELL, M.D.

- Chair, Abdominal Structured Reporting Subcommittee, Radiological Society of North America
- Chair, MRI Committee, RadLex, Radiological Society of North America
- Member, Liver Imaging Reporting and Data System (LIRADS) Steering Committee, American College of Radiology
- Chair, Liver Imaging Reporting and Data System (LIRADS) Management Working Group, American College of Radiology
- Member, Liver Imaging Reporting and Data System (LIRADS) Radiology-Pathology Correlation Working Group, American College of Radiology
- Member, Liver Imaging Reporting and Data System (LIRADS) Hepatobiliary Contrast Agent Working Group, American College of Radiology
- Member, Committee on Clinical Growth, International Society for Magnetic Resonance in Medicine
- Member, Governance Committee, International Society for Magnetic Resonance in Medicine
- Member, Expert Panel on Women's Imaging, American College of Radiology Appropriateness Criteria, American College of Radiology
- Member, Childhood Liver Disease Research and Education Network Data and Safety Monitoring Board, National Institute of Diabetes and Digestive and Kidney Diseases
- Director, MR Refresher Course Track, Annual Meeting, Radiological Society of North America
- Abstract Reviewer, Annual Meeting, International Society for Magnetic Resonance in Medicine
- Managing Editor, MRI Teaching File Resident and Fellow Section, American College of Radiology
- Associate Editor, *Journal of Magnetic Resonance Imaging*
- Member, Editorial Board, *Abdominal Imaging*
- Member, Editorial Board, *Radiology*

- Reviewer, *Academic Radiology*
- Reviewer, *American Journal of Roentgenology*
- Reviewer, *Investigational Radiology*
- Reviewer, *Radiographics*

WILLIAM MORRISON, M.D.

- President-elect, Society of Skeletal Radiology
- Chairman, Program Committee, Society of Skeletal Radiology
- Chairman, Corporate Liaison ad hoc Committee, Society of Skeletal Radiology
- Chairman, Sponsorship Committee, International Skeletal Society
- Chairman, Musculoskeletal Section Program Committee, International Society of Magnetic Resonance in Medicine
- Member, Expert Panel on Musculoskeletal Radiology, Bone Tumors, American College of Radiology Appropriateness Criteria, American College of Radiology
- Member, Arthritis Advisory Committee, Food and Drug Administration
- Member, Expert Panel on Musculoskeletal Radiology, Continuous Professional Improvement Series, American College of Radiology
- Member, Board of Directors, BalletX Dance Company
- Member, Program Committee, International Skeletal Society
- Member, Musculoskeletal Maintenance of Certificate Cognitive Exam Committee, American Board of Radiology
- Member, Annual Meeting Promotion Committee, International Skeletal Society
- Medical Consultant, Philadelphia Eagles
- Medical Consultant, Philadelphia Phillies
- Medical Consultant, Philadelphia Flyers
- Medical Consultant, Pennsylvania Ballet
- Medical Consultant, BalletX Dance Company
- Member, Consulting Editorial Board, *Skeletal Radiology*
- Reviewer, Abstracts, Annual Meeting, Society of Skeletal Radiology
- Reviewer, Abstracts, Annual Meeting, International Society of Magnetic Resonance in Medicine
- Reviewer, *American Journal of Roentgenology*
- Reviewer, *Diabetic Medicine*
- Reviewer, *Journal of Magnetic Resonance Imaging*
- Reviewer, *Osteoarthritis and Cartilage*
- Reviewer, *Radiology*
- Reviewer, *Skeletal Radiology*

LEVON NAZARIAN, M.D.

- Chair, Corporate Affairs Committee, Society of Radiologists in Ultrasound
- Member, Public Information Advisory Network, Radiological Society of North America
- Member, Program Committee, Society of Radiologists in Ultrasound
- Editor-in-Chief, *Journal Ultrasound in Medicine*
- Member, Advisory Editorial Board, *Ultrasound in Medicine and Biology*
- Medical Advisor, Public Web Site, Radiological Society of North America and American College of Radiology
- Consultant to the Editor, *Radiology*
- Distinguished Reviewer, *American Journal of Roentgenology*

- Reviewer, *Arthritis and Rheumatism*
- Reviewer, *Journal of Clinical Ultrasound*
- Reviewer, *Clinical Orthopaedics and Related Research*
- Named as one of the “Best Doctors in America”
- Dean’s Award for Excellence in Education, Jefferson Medical College, 2013
- Robert H. Condon, MD Teaching Award, Thomas Jefferson University Hospital
- Jefferson Medical College Outstanding Clinician Award – Hospital Based Medicine Category, Jefferson Medical College

LAURENCE NEEDLEMAN, M.D.

- President, Board of Directors, Intersocietal Commission on Accreditation of Vascular Laboratories
- Member, Guidelines and Standards Committee on Drug and Contrast, American College of Radiology
- Member, Collaborative Committee, Practice Guideline for the Performance of Renal Artery Duplex Sonography, American College of Radiology/American Institute of Ultrasound in Medicine/Society of Pediatric Radiology/Society of Radiologists in Ultrasound
- Chair, Collaborative Committee, Practice Guideline for the Performance of Peripheral Arterial Ultrasound Using Color and Spectral Doppler, American College of Radiology and Society of Radiologists in Ultrasound
- Member, Endowment for Education and Research Committee, American Institute of Ultrasound in Medicine
- Member, Continuous Professional Improvement Panel, Ultrasound, American College of Radiology
- Member, Public Information Advisors Network, Radiological Society of North America
- Member, Editorial Board, *Journal of Ultrasound in Medicine*
- Subspecialty Editor, Vascular Ultrasound, *Journal of Ultrasound in Medicine*
- Reviewer, *Journal of Ultrasound in Medicine*
- Reviewer, *Radiology*

PATRICK O’KANE, M.D.

- Reviewer, *Radiographics*

LAURENCE PARKER, PH.D.

- Reviewer, *Journal of the American College of Radiology*

VIJAY RAO, M.D.

- Member, Board of Directors, Radiological Society of North America
- Member, Board of Directors, Pennsylvania Radiological Society
- Member, Board of Directors, American Board of Radiology Foundation
- President, Research & Education Foundation, American Association for Women Radiologists

- Alternate Councilor to the American College of Radiology, Pennsylvania Radiological Society
- Member, Executive Board, The Philadelphia Roentgen Ray Society
- Member, Finance Committee, American Association for Women Radiologists
- Member, Bylaws Committee, American Association for Women Radiologists
- Member, Future Trends Committee, American College of Radiology
- Member, Utilization Management Committee, American College of Radiology
- Member, Practice and Leadership Development Committee, American College of Radiology
- Member, Government & Regulatory Issues in Academic Radiology, American College of Radiology
- Member, Clinical Practice Committee, American Society of Neuroradiology
- Member, Committee on Radiological Practice and Management, Pennsylvania Radiological Society
- Member, Appropriateness Criteria, Utilization & Quality Subcommittee, American Society of Neuroradiology
- Member, Economic Committee and Hospital Advisory Committee, Philadelphia Roentgen Ray Society
- Member, Committee on Diagnostic Radiology, Pennsylvania Radiological Society
- Member, Editorial Board, *American Journal of Radiology*
- Member, Editorial Board, *Journal of the American College of Radiology*
- Reviewer, Abstracts, Annual Meeting, American Society of Head and Neck Radiology
- Reviewer, Scientific Exhibits, Radiographics Annual Meeting, Radiological Society of North America
- Reviewer, *Academic Radiology*
- Reviewer, *American Journal of Neuroradiology*
- Reviewer, *Radiographics*
- Reviewer, *Radiology*
- Named as one of the “America’s Top Doctors for Cancer”, Castle Connolly Medical Ltd.
- Named as one of the “America’s Best Doctors”
- Named as one of “Philadelphia SuperDocs”
- Named as one of the “Top 10 Doctors”, Vitals™
- Named as one of the “Best Physicians for Women”, *Philadelphialife*
- Named as one of the “Top Docs”, *Philadelphia Magazine*

CHRISTOPHER ROTH, M.D.

- Distinguished Reviewer, *Journal of Magnetic Resonance Imaging*

ALEXANDER SEVRUKOV, M.D.

- Reviewer, *American Journal of Roentgenology*

COLETTE SHAW, M.D.

- Member, Appropriateness Criteria Expert Panel, American College of Radiology
- Peer Reviewer, National Peer Review Council
- Reviewer, *Journal of Vascular and Interventional Radiology*

KIRAN TALEKAR, M.D.

- Guest Editor, *Year Book of Ophthalmology*

LISA TARTAGLINO, M.D.

- Reviewer, *Radiographics*
- Reviewer, *Radiology*

MATHEW THAKUR, PH.D.

- Member, Past-Presidents Committee, Society of Nuclear Medicine
- Member, Board of Governors, Greater New York Chapter, Society of Nuclear Medicine
- Member, Advisory Committee, US Pharmacopeia
- Member, Advisory Committee, Kuwait Medical Research Council
- Member, Advisory Committee, International Atomic Energy Agency
- Member, Publication Committee, Society of Nuclear Medicine
- Member, Public Relations Committee, Society of Nuclear Medicine
- Member, Grant Review Service, Foundation for Medical Research, Vienna, Austria
- Member, Wagner-Terruzuka Fellowship Committee, Society of Nuclear Medicine
- Reviewer, Grants, NExT Study Section, National Institutes of Health
- Ad hoc Member, Grant Review Service, National Institutes of Health
- Member, Advisory Committee, Annual Meeting, Society of Nuclear Medicine India
- Member, Editorial Board, *Current Molecular Imaging*
- Member, Editorial Board, *European Journal of Nuclear Medicine and Molecular Imaging*
- Member, Editorial Board, *Journal of the Association of Latin American Societies of Nuclear Medicine and Biology*
- Member, Editorial Board, *Journal of the Indian Association of Clinical Medicine*
- Member, Editorial Board, *Journal of Labeled Compounds and Radiopharmaceuticals*
- Member, Editorial Board, *Journal of Nuclear Medicine*
- Member, Editorial Board, *Journal of Nuclear Medicine and Biology*
- Member, Editorial Board, *Nuclear Medicine Communications*
- Member, Editorial Board, *Turkish Journal of Molecular Imaging and Radionuclide Therapy*
- Reviewer, *American Journal of Pathology*
- Reviewer, *Applied Organometallic Chemistry*
- Reviewer, *Bioconjugate Chemistry*
- Reviewer, *Bioorganic and Medicinal Chemistry*
- Reviewer, *Bioorganic and Medicinal Chemistry Letters*
- Reviewer, *Breast Cancer Research*
- Reviewer, *Cancer Biotherapy & Radiopharmaceuticals*
- Reviewer, Cardiovascular Imaging, *Journal of the American College of Cardiology*
- Reviewer, *Circulation*
- Reviewer, *Current Molecular Imaging*
- Reviewer, *European Journal of Nuclear Medicine*
- Reviewer, *European Journal of Nuclear Medicine and Molecular Imaging*
- Reviewer, *Journal of Labeled Compounds and Radiopharmaceuticals*
- Reviewer, *Journal of Nuclear Medicine and Biology*
- Reviewer, *Metabolites*
- Reviewer, *Molecular Imaging & Biology*

- Reviewer, *Molecular Pharmaceutics*
- Reviewer, *Netherland Government Grant*
- Reviewer, *Nuclear Medicine and Biology*
- Reviewer, *Nuclear Medicine Communications*
- Reviewer, *Oncology*
- Reviewer, *Separation Science*
- Reviewer, *The Open Medical Imaging Journal*
- Reviewer, *Veterinarian Journal of Pharmaceuticals and Therapy*

NYLAH WASTI, M.D.

- Director, Communications and Public Relations, Board of Directors, Imamia Medics International
- Representative, United Nations Commission on the Status of Women, Imamia Medics International

MICHAEL WOLF, M.D.

- Reviewer, *Journal of Neurographics*

ADAM ZOGA, M.D.

- Member, Practice Guidelines and Clinical Standards Committee, Society of Skeletal Radiology
- Member, Musculoskeletal Appropriateness Criteria Committee, American College of Radiology
- Poster Reviewer, Radiographics Annual Meeting, Radiological Society of North America
- Member, Editorial Board, *Seminars in Musculoskeletal Radiology*
- Distinguished Reviewer, International Society of Magnetic Resonance in Imaging
- Reviewer, *Archives in Physical Medicine and Rehabilitation*
- Reviewer, *American Journal of Sports Medicine*
- Reviewer, *Radiographics*
- Reviewer, *Radiology*
- Reviewer, *American Journal of Radiology*
- Reviewer, *Clinical Orthopaedics and Related Research*
- Reviewer, *Journal of Magnetic Resonance Imaging*
- Reviewer, *Osteoarthritis and Cartilage*
- Reviewer, *Scandinavian Journal of Medicine and Science in Sports*

APPENDIX IV - ACTIVE GRANTS

07/01/12 - 06/30/13

(Report reflects entire project period awarded and TJU fiscal year expensed)

NIH/OTHER FEDERAL GRANTS

PRINCIPAL INVESTIGATOR	TITLE OF PROJECT	FUNDING SOURCE	FUNDING DATES	DIRECT COSTS	INDIRECT COSTS	TOTAL COSTS FUNDED
Flanders, A. X13001	Value of MRI and DTI as Biomarkers for Classifying Acute Spinal Cord Injury	U.S. Army Medical Research Acq. W81XWH-10-1-0935	09/30/10 - 10/31/13	\$488,255	\$268,175	\$756,430
				----- \$76,241 (current fiscal yr)	----- \$42,033 (current fiscal yr)	----- \$118,274 (current fiscal yr)
Flanders, A. Z55301 (subcontract)	In Silico Research Center for Excellence	NIH (SAIC-Frederick) thru Emory University Contract #29XS193	08/24/09 - 08/23/13	\$55,117	\$30,181	\$85,299
				----- \$0 (current fiscal yr)	----- \$0 (current fiscal yr)	----- \$0 (current fiscal yr)
Flanders, A. Z63101 (subcontract)	Contract HHSN261200800001E	NIH (NCI) thru SAIC-Frederick	02/24/12-02/23/15	\$6,968	\$3,832	\$10,800
				----- \$6,465 (current fiscal yr)	----- \$0 (current fiscal yr)	----- \$6,465 (current fiscal yr)
Flanders, A. Z66001 (subcontract)	Contract HHSN2600800001E	NIH (SAIC-Frederick) thru Emory University	10/31/12-09/30/13	\$18,400	\$10,120	\$28,520
				----- \$11,388 (current fiscal yr)	----- \$6,264 (current fiscal yr)	----- \$17,652 (current fiscal yr)
Forsberg, F. AI0206	Health Research Formula Fund	PA Department of Health	01/01/12-12/31/15	\$50,000	\$0	\$50,000
				----- \$0 (current fiscal yr)	----- \$0 (current fiscal yr)	----- \$0 (current fiscal yr)
Forsberg, F. R99001	Quantitative Subharmonic Breast Imaging	NIH R01 CA140338	05/01/10-02/28/15	\$1,651,250	\$419,678	\$2,070,928
				----- \$259,177 (current fiscal yr)	----- \$99,642 (current fiscal yr)	----- \$358,819 (current fiscal yr)
Forsberg, F. S09201	Noninvasive Subharmonic Aided Pressure Estimation of Portal Hypertension	NIH R01 DK098526	04/01/13-03/31/17	\$1,744,158	\$445,985	\$2,190,143
				----- \$16,802 (current fiscal yr)	----- \$9,157 (current fiscal yr)	----- \$25,959 (current fiscal yr)

Forsberg, F. X12301	Noninvasive Pressure Estimation for Monitoring Breast Cancer Lesion Differentiation	U.S. Army Medical Research Acq. W81XWH-08-1-0503	09/01/08-01/31/13	\$297,357 ----- \$16,399 (current fiscal yr)	\$162,060 ----- \$7,919 (current fiscal yr)	\$459,417 ----- \$24,318 (current fiscal yr)
Forsberg, F. X13601 (Post-Doc Award) (Eisenbrey, J.)	Analysis of 3D subharmonic Ultrasound Signals from Patients with Known Breast Masses for Lesion Differentiation	U.S. Army Medical Research Acq. W81XWH-11-1-0630	09/30/11 - 09/29/14	\$183,793 ----- \$59,795 (current fiscal yr)	\$14,704 ----- \$4,794 (current fiscal yr)	\$198,497 ----- \$64,589 (current fiscal yr)
Forsberg, F. X13901	Subharmonic Imaging and Pressure Estimation for Monitoring Neoadjuvant Chemotherapy	U.S. Army Medical Research Acq. W81XWH-12-1-006	08/01/12-08/31/14	\$373,326 ----- \$128,945 (current fiscal yr)	\$186,111 ----- \$69,206 (current fiscal yr)	\$559,437 ----- \$198,151 (current fiscal yr)
Intenzo, C. Z56501	ACRIN 6685: FDG-PET of Head and Neck Cancer	NIH thru ACRIN (cooperative group)	01/01/10 - 12/31/13	\$21,667 ----- \$0 (current fiscal yr)	\$4,333 ----- \$0 (current fiscal yr)	\$26,000 ----- \$0 (current fiscal yr)
Intenzo, C. Z56701	ACRIN 6688: Phase II Study of 3'-deoxy-3'18F Fluorothymidine (FLT) in Invasive Breast Cancer	NIH thru ACRIN (cooperative group)	04/01/10 - 03/31/13	\$98,967 ----- \$0 (current fiscal yr)	\$19,793 ----- \$0 (current fiscal yr)	\$118,760 ----- \$0 (current fiscal yr)
Thakur, M. AG0205	Health Research Formula Fund	PA Department of Health	01/01/10 - 12/31/13	\$83,000 ----- \$0 (current fiscal yr)	\$0 ----- \$0 (current fiscal yr)	\$83,000 ----- \$0 (current fiscal yr)
Thakur, M. AH0203	Health Research Formula Fund	PA Department of Health	01/01/11 - 12/31/14	\$83,000 ----- \$83,000 (current fiscal yr)	\$0 ----- \$0 (current fiscal yr)	\$83,000 ----- \$83,000 (current fiscal yr)
Thakur, M. AI0207	Health Research Formula Fund	PA Department of Health	01/01/12-12/31/15	\$83,000 ----- \$0 (current fiscal yr)	\$0 ----- \$0 (current fiscal yr)	\$83,000 ----- \$0 (current fiscal yr)

Thakur, M. S06401	VPAC1 Receptor-Targeted PET Imaging of Prostate Cancer	NIH S10 RR023709	04/19/12 - 03/31/17	\$1,916,916 ----- \$185,547 (current fiscal yr)	\$736,189 ----- \$102,186 (current fiscal yr)	\$2,653,105 ----- \$287,733 (current fiscal yr)
TOTAL NIH/FEDERAL FUNDING				\$7,155,174 -----	\$2,301,161 -----	\$9,456,335 -----
CURRENT TJU FY NIH/FEDERAL FUNDING				\$843,759 (current fiscal yr)	\$341,201 (current fiscal yr)	\$1,184,960 (current fiscal yr)

APPENDIX IV - ACTIVE GRANTS

07/01/12 - 06/30/13

(Report reflects entire project period awarded and TJU fiscal year expensed)

FOUNDATION/NON-PROFIT ORGANIZATION GRANTS

PRINCIPAL INVESTIGATOR	TITLE OF PROJECT	FUNDING SOURCE	FUNDING DATES	DIRECT COSTS	INDIRECT COSTS	TOTAL COSTS FUNDED
Rao, V. F65401	Center for Research on Utilization of Imaging Services	American College of Radiology	01/01/04 - 5/16/13	\$534,340	\$0	\$534,340
				----- \$87,373 (current fiscal yr)	----- \$0 (current fiscal yr)	----- \$87,373 (current fiscal yr)
			TOTAL NON-PROFIT FUNDING	\$534,340	\$0	\$534,340
			CURRENT TJU FY NON-PROFIT FUNDING	----- \$87,373 (current fiscal yr)	----- \$0 (current fiscal yr)	----- \$87,373 (current fiscal yr)

APPENDIX IV - ACTIVE GRANTS

07/01/12 - 06/30/13

(Report reflects entire project period awarded and TJU fiscal year expensed)

INDUSTRIAL GRANTS

PRINCIPAL INVESTIGATOR	TITLE OF PROJECT	FUNDING SOURCE	FUNDING DATES	DIRECT COSTS	INDIRECT COSTS	TOTAL COSTS FUNDED
Brown, D. J78501	A Phase III Clinical Trial of Intra-arterial TheraSphere® in the Treatment of Patients with Unresectable Hepatocellular Carcinoma (HCC)	Nordion, Inc.	08/11/12-09/10/15	\$56,090	\$11,785	\$67,875
				----- \$7,160 (current fiscal yr)	----- \$1,790 (current fiscal yr)	----- \$8,950 (current fiscal yr)
Flanders, A. A53601	ADCON-L MRI Research Project	GliaTech	09/01/01 - 12/31/50	\$25,000	\$6,250	\$31,250
				----- \$0 (current fiscal yr)	----- \$0 (current fiscal yr)	----- \$0 (current fiscal yr)
Forsberg, F. J75701	Improved Visualization and Identification of Breast Microcalcifications Identified with MicroPure Compared to Grayscale Ultrasound Using Mammography as the Reference Standard	Toshiba Medical Systems, Inc.	04/18/12-04/30/13	\$35,540	\$8,000	\$43,540
				----- \$0 (current fiscal yr)	----- \$0 (current fiscal yr)	----- \$0 (current fiscal yr)
Forsberg, F. J82601	Contrast-Enhanced Ultrasound for the Evaluation of Renal Cell Carcinoma Cryoablation	GE Healthcare, Inc.	01/15/13-01/14/14	\$9,731	\$2,769	\$12,500
				----- \$8,000 (current fiscal yr)	----- \$2,000 (current fiscal yr)	----- \$10,000 (current fiscal yr)
Goldberg, B. J56701	Characterization of Focal Liver Lesions	Bracco Diagnostics, Inc.	12/17/09-06/30/13	\$182,500	\$44,250	\$226,750
				----- \$2,240 (current fiscal yr)	----- \$560 (current fiscal yr)	----- \$2,800 (current fiscal yr)
Goldberg, B. J66701	Evaluation of the Aixplorer Ultrasound System for Abdominal, Gynecological, and Vascular Applications	SuperSonic Imagine, Inc.	04/14/11 - 10/13/12	\$1,496	\$500	\$1,996
				----- \$1,496 (current fiscal yr)	----- \$500 (current fiscal yr)	----- \$1,996 (current fiscal yr)

Halpern, E. J56801	Cost Benefit Analysis	Philips Healthcare	08/01/09-12/31/12	\$10,500 ----- \$0 (current fiscal yr)	\$0 ----- \$0 (current fiscal yr)	\$10,500 ----- \$0 (current fiscal yr)
Halpern, E. J69801	Evaluation of the Aixplorer Ultrasound System for Evaluation of the Prostate	SuperSonic Imagine, Inc.	09/15/11 - 09/14/12	\$10,500 ----- \$0 (current fiscal yr)	\$2,000 ----- \$0 (current fiscal yr)	\$12,500 ----- \$0 (current fiscal yr)
Mitchell, D. J47101	Evaluation of Hepatocellular Carcinoma Response	Philips Medical Systems America	01/08/09-01/31/13	\$12,500 ----- \$0 (current fiscal yr)	\$0 ----- \$0 (current fiscal yr)	\$12,500 ----- \$0 (current fiscal yr)
Sharma, D. N15401	Digital Imaging Research	AGFA Corporation	08/01/12-12/31/13	\$2,407 ----- \$2,407 (current fiscal yr)	\$963 ----- \$963 (current fiscal yr)	\$3,370 ----- \$3,370 (current fiscal yr)
Thakur, M. N14501	VPAC-1 Breast Biomarkers	NuView Radio- Pharmaceuticals	04/06/12 - 02/14/14	\$187,703 ----- \$62,626 (current fiscal yr)	\$91,036 ----- \$30,374 (current fiscal yr)	\$278,739 ----- \$93,000 (current fiscal yr)
				TOTAL INDUSTRIAL FUNDING	\$533,967 -----	\$167,553 -----
				CURRENT YEAR INDUSTRIAL FUNDING	\$83,929 (current fiscal yr)	\$36,187 (current fiscal yr)
				TOTAL FUNDING	\$8,223,481	\$2,468,714
				TOTAL CURRENT YEAR FUNDING	\$1,015,061 (current fiscal yr)	\$377,388 (current fiscal yr)
						\$10,692,195 ----- \$1,392,449 (current fiscal yr)

APPENDIX V - SUBMITTED GRANTS

07/01/12 - 06/30/13

(Report reflects entire award period and first year of award)

NIH/OTHER FEDERAL GRANTS

PRINCIPAL INVESTIGATOR	TITLE OF PROJECT	FUNDING SOURCE	POTENTIAL FUNDING DATES	DIRECT COSTS	INDIRECT COSTS	TOTAL COSTS FUNDED
Flanders, A.	In Silico Research Center	NIH thru Emory University	09/01/12 - 08/31/13	\$20,000	\$11,000	\$31,000
FUNDED				----- \$20,000 (-01 year)	----- \$11,000 (-01 year)	----- \$31,000 (-01 year)
Forsberg, F.	3D Subharmonic Pressure Maps of Vulnerable Plaques	NIH	07/01/13 - 06/30/15	\$306,429	\$145,137	\$451,566
JIT REQUESTED				----- \$150,000 (-01 year)	----- \$76,387 (-01 year)	----- \$226,387 (-01 year)
Forsberg, F.	Ultrasound Bubble Mediated Pancreatic Cancer Therapy with Subharmonic Monitoring	NIH	12/01/13 - 11/30/17	\$2,107,661	\$584,342	\$2,692,003
				----- \$464,246 (-01 year)	----- \$121,307 (-01 year)	----- \$585,553 (-01 year)
Halpern, E.	Active Surveillance of Prostate Cancer: Informed Decision Making with Contrast-Enhanced Sonography	PCORI	05/01/14 - 04/30/16	\$299,216	\$573,096	\$872,312
				----- \$173,400 (-01 year)	----- \$66,960 (-01 year)	----- \$240,360 (-01 year)
Halpern, E.	Chest Pain Evaluation in the Emergency Department: Improving the Patient Experience and Future Cardiovascular Health	PCORI	09/01/13 - 08/31/16	\$1,272,490	\$434,596	\$1,707,086
				----- \$414,181 (-01 year)	----- \$128,473 (-01 year)	----- \$542,654 (-01 year)
Halpern, E.	Detection of Clinically Significant Prostate Cancer: A Randomized Trial of CEUS	NIH	12/01/13 - 11/30/18	\$2,372,853	\$1,305,070	\$3,677,923
				----- \$472,974 (-01 year)	----- \$260,136 (-01 year)	----- \$733,110 (-01 year)
Lyshchik, A.	Molecular Lymphosonography for Sentinel Lymph Node Characterization	NIH	04/01/14 - 03/31/16	\$275,000	\$151,250	\$426,250
JIT REQUESTED				----- \$150,000 (-01 year)	----- \$82,500 (-01 year)	----- \$232,500 (-01 year)

Morrison, W.	Standardized T1rho and T2 Knee MRI	NIH thru University of Pennsylvania	04/01/13 - 03/31/18	\$125,000 ----- \$25,000 (-01 year)	\$68,750 ----- \$13,750 (-01 year)	\$193,750 ----- \$38,750 (-01 year)
Thakur, M.	PET Imaging of Breast Cancer Using Oncogene Expression	NIH	07/01/13 - 06/30/18	\$1,799,914 ----- \$323,919 (-01 year)	\$989,952 ----- \$178,155 (-01 year)	\$2,789,866 ----- \$502,074 (-01 year)
Thakur, M. JIT REQUESTED	SPECT/CT for Small Animal Imaging Facility at TJU	NIH	04/01/14 - 03/31/15	\$599,569 ----- \$599,569 (-01 year)	\$0 ----- \$0 (-01 year)	\$599,569 ----- \$599,569 (-01 year)
TOTAL FEDERAL GRANT FUNDING				\$9,178,132 -----	\$4,263,193 -----	\$13,441,325 -----
TOTAL FIRST YEAR FEDERAL FUNDING				\$2,793,289 (-01 year)	\$938,668 (-01 year)	\$3,731,957 (-01 year)

APPENDIX V - SUBMITTED GRANTS

07/01/12 - 06/30/13

(Report reflects entire award period and first year of award)

FOUNDATION/NON-PROFIT ORGANIZATION GRANTS

PRINCIPAL INVESTIGATOR	TITLE OF PROJECT	FUNDING SOURCE	POTENTIAL FUNDING DATES	DIRECT COSTS	INDIRECT COSTS	TOTAL COSTS FUNDED
Gorniak, R.	Resident Call Simulator (RCS): A System to Augment Resident Call Preparation	Radiological Society of North America	07/01/13 - 06/30/14	\$67,500	\$0	\$67,500
				-----	-----	-----
				\$67,500 (-01 year)	\$0 (-01 year)	\$67,500 (-01 year)
Lyshchik, A.	Contrast Enhanced Ultrasound Identification of Sentinel Lymph Nodes in Breast Cancer	American Cancer Society	07/01/13 - 06/30/14	\$12,800	\$0	\$12,800
				-----	-----	-----
				\$12,800 (-01 year)	\$0 (-01 year)	\$12,800 (-01 year)
TOTAL NON-PROFIT FUNDING				\$80,300	\$0	\$80,300
TOTAL FIRST YEAR NNO-PROFIT FUNDING				\$80,300 (-01 year)	\$0 (-01 year)	\$80,300 (-01 year)

APPENDIX V - SUBMITTED GRANTS

07/01/12 - 06/30/13

(Report reflects entire award period and first year of award)

INDUSTRIAL GRANTS

PRINCIPAL INVESTIGATOR	TITLE OF PROJECT	FUNDING SOURCE	POTENTIAL FUNDING DATES	DIRECT COSTS	INDIRECT COSTS	TOTAL COSTS FUNDED
Forsberg, F.	Evaluation of a New Ultrasound Image Processing Technique Designed to Improve Visualization of Flow Signals	Toshiba American Medical Systems	07/15/13 - 03/31/14	\$19,231 ----- \$19,231 (-01 year)	\$5,769 ----- \$5,769 (-01 year)	\$25,000 ----- \$25,000 (-01 year)
Intenzo, C.	A Retrospective Clinical Study to Compare the Rates of Agreement Between Clinical Diagnosis and Visual Assessment of DaTscan Images in Non-Caucasian and Caucasian Subjects with Parkinson's Disease or Essential Tremor	GE Healthcare, Inc.	01/28/14 - 01/27/15	\$21,696 ----- \$21,696 (-01 year)	\$6,074 ----- \$6,074 (-01 year)	\$27,770 ----- \$27,770 (-01 year)
				TOTAL INDUSTRIAL FUNDING	\$40,927 -----	\$11,843 -----
				TOTAL FIRST YEAR INDUSTRIAL FUNDING	\$40,927 (-01 year)	\$11,843 (-01 year)
				TOTAL PENDING FUNDING	\$9,299,359 -----	\$4,275,036 -----
				TOTAL FIRST YEAR PENDING FUNDING	\$2,914,516 (-01 year)	\$950,511 (-01 year)