2005

Department of Radiology-Annual Executive Summary Report-July 1, 2004 to June 30, 2005

Vijay M. Rao M.D.

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3D volume renderings of coronary CT angiograms

Normal coronary arteries

Coronary artery with stents in the left anterior descending and left circumflex arteries
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 stay at the cutting edge of imaging research
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DEPARTMENT OF RADIOLOGY

Vijay M. Rao, M.D.
Professor and Chairman

Barry B. Goldberg, M.D. Vice Chair for Strategic Planning
Ethan J. Halpern, M.D. Vice Chair for Research
Chris R.B. Merritt, M.D. Vice Chair for Information Technology
Levon N. Nazarian, M.D. Vice Chair for Education

2004-2005

DEPARTMENT CLINICAL DIVISIONS AND DIRECTORS

BODY COMPUTED TOMOGRAPHY/ABDOMINAL IMAGING
Laurence Needleman, M.D.

BREAST IMAGING/AMBULATORY RADIOLOGY
Catherine W. Piccoli, M.D.

CARDIOVASCULAR/INTERVENTIONAL RADIOLOGY
Kevin L. Sullivan, M.D.

MAGNETIC RESONANCE IMAGING
Donald G. Mitchell, M.D.

MUSCULOSKELETAL AND GENERAL DIAGNOSTIC RADIOLOGY
William B. Morrison, M.D.

NEURORADIOLOGY/HEAD AND NECK RADIOLOGY
Adam E. Flanders, M.D.
David P. Friedman, M.D.

NUCLEAR MEDICINE
Charles M. Intenzo, M.D.

THORACIC RADIOLOGY
Narainder Gupta, M.D.

ULTRASOUND
Barry B. Goldberg, M.D.

METHODIST HOSPITAL DIVISION
Larry A. Caputo, M.D.

DEPARTMENTAL COMMITTEES AND CHAIRMEN

ADVISORY COMMITTEE
Alfred B. Kurtz, M.D.

CONTRAST COMMITTEE
Laurence Needleman, M.D.

EDUCATION COMMITTEE
Levon N. Nazarian, M.D.

INFORMATICS COMMITTEE
Christopher R.B. Merritt, M.D.

PERFORMANCE IMPROVEMENT COMMITTEE
Stephen Karasick, M.D.

SCIENTIFIC ADVISORY FOR IMAGING RESEARCH
Barry B. Goldberg, M.D.
Ethan J. Halpern, M.D.

RESIDENCY SELECTION COMMITTEE
Levon N. Nazarian, M.D.
RADIOLOGY DEPARTMENT FACULTY RANK
2004-2005

PROFESSORS
Rick I. Feld, M.D.
Adam E. Flanders, M.D.
Flemming Forsberg, Ph.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.
Anna S. Lev-Toaff, M.D.
Donald G. Mitchell, M.D.
Levon N. Nazarian, M.D.
Vijay M. Rao, M.D.
Kevin L. Sullivan, M.D.
Mathew L. Thakur, Ph.D.

ASSISTANT PROFESSORS
Diane C. Bergin, M.D.
Diane Deely, M.D.
W. Scott Enochs, M.D., Ph.D.
Eric Gingold, Ph.D.
Carin F. Gonsalves, M.D.
Narainder Gupta, M.D.
Sung M. Kim, M.D.
Patrick L. O'Kane, M.D.
Sharon R. Segal, D.O.
Zsuzsanna Therien, M.D.
Shaoxiong Zhang, M.D., Ph.D.
Adam C. Zoga, M.D.

RESEARCH PROFESSOR
Christopher R.B. Merritt, M.D.

ASSOCIATE PROFESSORS
Oksana H. Baltarowich, M.D.
Joseph Bonn, M.D.
David J. Eschelman, M.D.
David P. Friedman, M.D.
Song Lai, Ph.D.
William B. Morrison, M.D.
Laurence Needleman, M.D.
Lisa M. Tartaglino, M.D.
Pamela Van Tassel, M.D.

CLINICAL ASSOCIATE PROFESSOR
Catherine W. Piccoli, M.D.

RESEARCH ASSOCIATE PROFESSORS
Ji-Bin Liu, M.D.

CLINICAL ASSISTANT PROFESSORS
Haroon Durrani, M.D.
Valerie Gilliam, M.D.
Patti J. Herling, M.D.
Bentley Hollinger, M.D.
Cindy Isaacson, M.D.
Lynn Lucas-Fehm, M.D.
Dinesh Sharma, M.D.
Terri Tuckman, M.D.
Annina N. Wilkes, M.D.

RESEARCH ASSISTANT PROFESSOR
Laurence Parker, Ph.D.

INSTRUCTORS
Susan DeWyngaert, M.D.
Joshua Mamelak, 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]

Ralph A. Carabasi, M.D., Professor of Surgery [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]

Paul Walinsky, M.D., Professor of Medicine [primary]
Assistant Professor of Radiology [secondary]
DEPARTMENT OF RADIOLOGY
Vijay M. Rao, M.D., Chairman

CLINICAL DIVISIONS 2004-2005

Body Computed Tomography/Abdominal Imaging
Directed by Laurence Needleman, M.D.
Drs. Oksana Baltarowich, Haroon Durrani, Rick Feld, Ethan Halpern, Patti Herling, Stephen Karasick, Alfred Kurtz, Anna Lev-Toaff, Levon Nazarian, Patrick O’Kane

Breast Imaging/Ambulatory Radiology
Directed by Catherine W. Piccoli, M.D.
Drs. Susan DeWyngaert, Valerie Gilliam, Bentley Hollander, Cindy Isaacson, Lynn Lucas-Fehm, Zeuzsanna Therien, Annina Wilkes

Cardiovascular/Interventional Radiology
Directed by Kevin L. Sullivan, M.D.
Drs. Joseph Bonn, David Eschelman, Carin Gonsalves

Magnetic Resonance Imaging
Directed by Donald G. Mitchell, M.D.
Drs. Diane Bergin, Diane Deely, Joshua Memelak, William Morrison, Patrick O’Kane, Catherine Piccoli, Adam Zoga

Musculoskeletal and General Diagnostic Radiology
Directed by William B. Morrison, M.D.
Drs. Diane Bergin, Diane Deely, Narainder Gupta, Patti Herling, Cindy Isaacson, David Karasick, Stephen Karasick, Donald Mitchell, Joshua Mamelak, Dinesh Sharma, Adam Zoga

Neuroradiology/ENT Radiology
Directed by Adam Flanders, M.D., David Friedman, M.D.
Drs. W. Scott Enochs, Vijay Rao, Dinesh Sharma, Lisa Tartaglino, Pamela Van Tassel

Nuclear Medicine
Directed by Charles M. Intenzo, M.D.
Drs. Narainder Gupta, Sung Kim

Thoracic Radiology
Directed by Narainder Gupta, M.D.
Drs. Dinesh Sharma, Patti Herling, Charles Intenzo, David Karasick, Stephen Karasick, William Morrison

Ultrasound
Directed by Barry B. Goldberg, M.D.
Drs. Oksana Baltarowich, Diane Bergin, Haroon Durrani, Rick Feld, Ethan Halpern, Patti Herling, Alfred Kurtz, Anna Lev-Toaff, Christopher Merritt, Donald Mitchell, Levon Nazarian, Laurence Needleman, Patrick O’Kane, Catherine Piccoli, Sharon Segal, Terri Tuckman, Annina Wilkes

Research
Drs. Flemming Forsberg, Eric Gingold, Song Lai, Ji-Bin Liu, Laurence Parker, Mathew Thakur, Shaoxiong Zhang
DEPARTMENT OF RADIOLOGY
HOUSESTAFF ROSTER
2004-2005

RESIDENTS

FIRST YEAR RESIDENTS

Nitesh Bhagat, M.D.
Garen Boghosian, M.D.
Jennifer Hubert, M.D.
Rashi I. Mehta, M.D.
Ketan Naran, M.D.
Neeta Rao, M.D.
Sudhir Vora, M.D.
Peter Wahba, M.D.

SECOND YEAR RESIDENTS

Joseph O. DeJesus, M.D.
Michael V. Dutka, M.D.
Alan R. Hammond, M.D.
Hilary M. Hochberg, M.D.
Bradley G. Leypold, M.D.
Susan Sung, M.D.
John D. York, M.D.

THIRD YEAR RESIDENTS

Lauren W. Averill, M.D.
Sachin Dheer, M.D.
Ronald J. Dolin, M.D.
Elizabeth H. Hau, M.D.
Christopher T. Kirkpatrick, M.D.
Dayna Levin, M.D.

FOURTH YEAR RESIDENTS

Justin T. Blum, M.D.
John S. Farrell, M.D.
Candace M. Howard-Claudio, M.D.
Laura A. Klein, M.D.
Geoffrey L. Manton, M.D.
Imran M. Omar, M.D.
Suken H. Shah, M.D.

ABDOMINAL IMAGING

Felipe Arias, M.D.
Kristin Edwards, M.D.
Thomas Gallagher, D.O.
Craig Michael Logan, II, M.D.
James Park, M.D.
Angel Premkumar, M.D.
Shujing Shang, M.D.

CARdiovascular/INTERVENTIONAL

Wayne Hwang, M.D.
Gautam Jagoo, M.D.
Prashant Patel, M.D.
Steven Wagner, M.D.
James Traiforos, M.D.

BODY MRI

Sandra L. Santiago, M.D.

MUSCULOSKELETAL

Laura Lee, M.D.
George Koulouris, M.D.
Gary Oxfeld, M.D.

BODY/NEURO MRI

Steven G. Finden, M.D.
Mudassir A. Shafi, M.D.
Tejas S. Shinde, M.D.
Ronald D. Waters, M.D.

NEURO/ENT

John Matthews, M.D.
Kavin D. Mistry, M.D.
Vipul Shah, M.D.
Department of Radiology Administration

Radiology Chairman
V.M. Rao, M.D.

Assoc Admin for Clin Operations
R. Blob
185 Staff

CT/MR JHN  FRC/KOP
26 Staff  49 Staff  5 Staff

Manager, Comp Facility
C. Lockard

Manager, US Educ
L. Waldroup

Admin Manager for Informatics
Tech Advisor
Adv MRI/CT/3D
P. Natale

Supply Coordinator
D. Guidi

JUREI

Manager, Rad Budget
L. Torres

2 Staff

Physicist

Manager, Admin Serv
J. Kott

47.3 Staff

Secretarial Support
L. Massanova

Billing Prof./Tech.

Coord Pt Registrars
D. Dimeo

Coordinator
Nuc. Med
D. Ramos

2 Staff

Timekeeper
L. Friedenberg

Special Projects

Manager, Film Library
B. Rowe

PAC Systems

PACS Admin
Y. Young

Coord Speech
Recog / WPC
L. Massanova

Coordinator
Film Library
B. Rowe

• Research

Chief Tech
J. Patel
Nuc. Med

Coord Satellite/Gen. Radiology
E. Smith

Coord Tech Serv
BIC / D. Snell

Coord Tech
2nd Shift
P. McCarthy

Coord Coordinator
Weekend Shift
M. Armstrong

Chief Tech
Sono
J. Darby

Coordinator
CVIR/Neuro
J. Botthof

Chief Tech
Gen. Rad/BIC
C. Slovak

Coordinator
Nurse Serv
L. Simmons

Chief Tech
Coord Sonography
E. Smith

Chief Tech
Coord Radiography
E. Smith

Chief Tech
Coord CT
E. Smith

Chief Tech
Coord Nuclear Medicine
E. Smith

Total # of Staff: 229

- Includes 16 FTEs funded by University (special purpose, overage, and college)
- Includes 8 FTEs funded by Hospital special purpose account
This past year has been unique in many respects. First, we proudly celebrated the centennial anniversary of our department — 100 years of excellence in clinical care, education, and research. Second, our campus has been filled with vibrant energy, new vision, renewed enthusiasm and perhaps some anxiety for the entire institution with the arrival of Robert Barchi, M.D., Ph.D., new President of Thomas Jefferson University.

I am pleased to report that we have had a very good year. We were able to successfully recruit new faculty members in several divisions, putting us in an enviable position for an academic department. The faculty morale remained positive. Our clinical practice remained strong. Our faculty has maintained strong and successful with research and educational programs.

I would like to extend my thanks to many individuals for our continued success. I would like to thank JoAnn Gardner for her loyalty and outstanding assistance, Victor Sarro for his hard work and knowledge of the business and operations of radiology and Andrea Frangos, for her hard work and her ability to multitask, including outstanding assistance in compiling this report. I would also like to acknowledge the assistance of Chris Merritt, M.D. for successfully completing challenging initiatives in clinical informatics, Barry Goldberg, M.D. and Ethan Halpern, M.D. for advancing the research mission of the department, and Levon Nazarian, M.D. for his commitment to advancing the educational mission of the department.

I also wish to acknowledge all of our division heads for their leadership and furthering the department mission. Thanks to each and every member of the faculty for their hard work, commitment, dedication and team spirit. It is gratifying to note that residents and fellow trainees emulate professionalism demonstrated by our faculty. We are excited about new growth opportunities in the coming year, both in South Philadelphia at Methodist and at our satellite locations. New technological advances in radiology continued to keep us intellectually stimulated. Reflections of the key events of the past year and upcoming planned initiatives reveal a promising bright future for the department. This report will address the key events of the past year in the following areas.

1) Department Organization
2) Clinical Activities
3) Planned New Clinical Programs
4) Clinical Weaknesses
5) Clinical Informatics
6) Educational Programs
7) Research Accomplishments
8) Research Weaknesses
9) Opportunities for Extramural Funding
10) Affiliations and Interdepartmental Activities
11) Department Administration
12) Department Goals
13) Issues for the College, University and Hospital
DEPARTMENT ORGANIZATION

During the past year, the department continued to function effectively with the hybrid structure combining modality-oriented and organ system-oriented divisions. Senior leadership of the department was reorganized with the appointment of two new Vice Chairs to increase efficiency and effectiveness of the clinical practice. Dr. Ethan Halpern was appointed Vice Chair for Research and Dr. Levon Nazarian was named Vice Chair for Education. Dr. Barry Goldberg assumed the position of Vice Chair for Strategic Planning, while Dr. Christopher Merritt continued to serve as Vice Chair for Information Technology. Dr. Narainder Gupta was recruited as Director, Division of Thoracic Radiology. Dr. Kevin Sullivan was recruited as Director of the Division of Cardiovascular/Interventional Radiology and Dr. Patti Herling was appointed as Medical Director of Jefferson Center City Imaging Center.

CLINICAL ACTIVITIES

The past year was a strong year, with the results of the hard work and dedication of the department continuing to show. We performed 272,520 procedures in hospital facilities and showed a 2% growth in the practice as compared with last fiscal year. Our total procedure volume including the caseload at satellite centers was 344,274 examinations, representing an overall growth of 3.7%. More complex types of imaging studies, such as MRI, CT, and nuclear medicine, continue to replace conventional radiography procedures. In general radiology, chest x-rays increased by 1% and bone and abdominal radiography increased by 4%, while fluoroscopic studies decreased by 12%. There was substantial growth in body CT, including chest CT, with a 14% growth in both inpatient and outpatient activity. In neuroradiology/ head and neck radiology there was an 17% increase in CT, but neuro MRI revealed a 1% decrease. Myelography and lumbar punctures under fluoroscopy remained stable. There was an 8% increase in body MR and a 1% increase in musculoskeletal MRI. Breast imaging showed a 7% decrease in diagnostic mammography procedure volume, but a 1% increase in screening mammography volume. There was an overall growth of 10% in nuclear medicine, primarily inpatient cardiovascular nuclear studies. Endocrine, GI, GU, brain and abscess imaging revealed nearly a 10% drop. Both ultrasound and cardiovascular interventional radiology remained stable with a slight increase in inpatient activity. Jefferson Center City Imaging (JCCI), our outpatient-imaging center, had an extremely successful year with 25,840 procedures being performed compared with 20,460 in the previous year, a 26% growth. The center is well managed by Outpatient Imaging Affiliates, LLC, with their aggressive marketing efforts producing positive results. Targets have been exceeded in PET, CT, MRI, and ultrasound, although conventional radiography and DEXA scanning remained below projection.

In body CT, 16 channel multi-detector CT scanners on the 3rd floor of the Gibbon Building have allowed us to enhance the coronary CT angiography, cardiac CT, and calcium scoring program. Drs. Ethan Halpern, David Levin, and Shaoxiong Zhang are leaders in the field of cardiac imaging and have been exploring state-of-the-art cardiac CT imaging procedures, resulting in the cardiac CT clinical service growing rapidly with over 250 exams performed to date and a completely full clinical schedule. Additionally, CT colonography is offered as a standard
examination, although we are awaiting clarification on payment from insurance carriers. With the increased activity, the CT service at the COB has been reestablished to alleviate overflow issues. The Brilliance 16 with CT fluoroscopy has facilitated throughput; the number of chest biopsies performed daily has increased and the musculoskeletal interventional program has expanded within the musculoskeletal and general radiology division, which performs procedures such as radiofrequency ablation of bone metastases, biopsies, vertebroplasty, and spinal and paraspinal therapeutic injections.

The musculoskeletal division is the official consultant for the Philadelphia Eagles, Phillies, Flyers and Sixers – no other musculoskeletal division in the country covers all four major sports teams. Additionally, the division serves as consult for various local college teams as well as the Kixx (professional soccer), Phantoms (minor league hockey), the Pennsylvania Ballet, and various sporting events held in Philadelphia such as the X-games.

In body MR, new 3 Tesla and 1.5 Tesla MR units were installed on the 3rd floor of the Gibbon building to replace the outdated unit currently on 10 Main. This equipment will reduce the waiting time for exams, as well as allow us to provide state-of-the-art examinations such as MR colonography and cardiac MR to the Jefferson community. New workstations have been acquired which will facilitate post-processing of images and image interpretation. The enhanced post-processing has enabled the neuroradiology/ head and neck radiology services to begin to explore functional MR imaging and other novel techniques including diffusion tensor imaging. The new MR systems will also improve our breast MR program in the breast imaging center for evaluating breast abnormalities and performing MRI guided breast biopsies.

The Philips Forte dual-headed gamma camera was installed in the nuclear medicine division during the past year. This system has the capability of both planar imaging of renal, hepatobiliary, lung, and total body bone scans, and SPECT imaging of all non-cardiac nuclear medicine examinations including bone, parathyroid, liver and somatostatin tumor imaging. The division has also developed a cardiac PET service, offering pharmacologic stress myocardial perfusion imaging with Rubidium-82, a PET tracer. PET imaging allows for higher sensitivity and specificity compared to myocardial SPECT imaging for myocardial ischemia.

Great strides have been made with the development of drug-eluding stent grafts, which are now routinely used in CVIR for transjugular intrahepatic portosystemic shunts and have a much lower restenosis rate than bare metal stents. Utilization of procedures such as chemoembolization, immunoembolization, and uterine fibroid embolization continued to grow and new procedures such as percutaneous pulmonary embolectomy provide our patients with state-of-the-art treatment options.

In ultrasound, Hitachi has provided their top of the line ultrasound system with unique elastography capabilities to evaluate abnormalities of the prostate, thyroid and musculoskeletal system by measuring the hardness of tissue. Two GE Logic Book portable ultrasound units have been acquired. One is housed in CVIR to aid needle guidance into vessels and abscesses, while also improving the efficiency of ultrasound physicians who no longer have to transfer a machine to the
interventional suites. The second is located in the Emergency Department for educational training of the residents. Levon Nazarian, MD, has continued to expand both diagnostic and therapeutic musculoskeletal applications of ultrasound. There has also been an increase in the clinical use of 3D ultrasound imaging in obstetrics and gynecology under the guidance of Anna Lev-Toaff, MD.

The pediatric radiology practice at A.I. duPont is strong with over 72,000 procedures performed annually. Over the past year, several of the centers of excellence clinical programs have created the need for more cardiac MRI, as well as broader interventional support of the solid organ transplant and spine surgery programs. In response to clinical needs, the interventional radiology section of DuPont has expanded to offer transcatheter venous thrombolysis and radiofrequency ablation. A.I. DuPont Radiology provides an excellent opportunity for Jefferson medical students, radiology, and pediatric residents to experience pediatric radiology.

Our satellite centers represent an important component of our clinical practice. They provide a large volume of interesting case material, which benefits our training programs as well as generating significant additional revenue. Doylestown MRI stabilized after facing increasing competition and regained its market share. InSight Health has acquired Langhorne MRI and Bala MRI centers; further expansion at Langhorne is anticipated. Overall, our practice at Academy Imaging Center remained strong.

Department performance metrics are measured and trended in three main categories: Faculty performance, Operations performance, and Financial performance. Faculty performance metrics include clinical productivity measured by work RVU’s, examination volume, report turnaround time, and academic productivity. Work RVU’s for clinical faculty are above the national median for academic radiologists as determined by the MGMA. Our average report turnaround time is now under 10 hours. A report is distributed to the faculty showing their individual performance compared with that of their colleagues. Academic productivity includes peer-reviewed publications, funded grants, grant applications submitted, books, book chapters, published abstracts, invited lectures, regional and international presentations. Faculty engage in one-on-one teaching activity on a daily basis, which is difficult to quantify. However residents’ evaluations of faculty effort and quality are given serious consideration. For clinical operations, performance metrics monitored include patient access, patient satisfaction surveys, and referring physician satisfaction.

PLANNED NEW CLINICAL FACILITIES AND PROGRAMS

After unexpected delays, the renovations of the 3rd floor of the Gibbon building and the 10th floor of the Main building continue and are expected to be completed in the fall of the upcoming year. The 3 Tesla and 1.5 Tesla magnets have been installed and the initial phases of construction are complete. The renovations in the Gibbon building will improve and expand the outpatient registration and waiting area to provide a warmer, more patient-friendly environment. The space in the inpatient waiting area will be increased to optimize nursing supervision of critical patients and patients recovering from invasive procedures. Additionally, consolidated
reading rooms will be created, allowing us to provide a more efficient service to our referring physicians. The renovations on 10 Main will increase the effectiveness of Radiology administration by providing a consolidated area for all administrative functions of the department, as well as physician offices.

In **body MRI**, MR colonography, coronary MR angiography, and cardiac MR services for evaluation of ischemic heart disease, wall motion abnormalities, myocardial viability, and ejection fraction will be offered once the new magnets are fully functional. We will also be able to greatly expand our MRA capabilities, particularly for peripheral vascular disease, improving the quality of the studies and reducing the examination time. In the **musculoskeletal and general diagnostic radiology division**, referrals for musculoskeletal CT are expected to increase for new imaging procedures such as arthroplasty and CT arthrography. In the **thoracic radiology division**, growth is anticipated in interventional procedures that include lung biopsies and RF ablation services for chest.

At the **breast imaging center**, Thomas Jefferson University Hospital leadership has targeted expansion of the breast cancer program with support through fundraising. The Development Committee of the TJUH board has endorsed the concept and preliminary plans have been proposed, including consolidation of the diagnostic and screening mammography services in renovated space at the medical office building. Additionally, expansion of screening mammography procedures is planned with increased digital mammography throughput and the addition of a new faculty member. In **CVIR**, the interventional group will institute an outpatient consultation service and introduce new techniques such as endovenous laser therapy for varicose vein ablation and radioactive microsphere treatment of hepatic malignancies. A Vascular Center is also planned and is in early phases of negotiations with multiple other departments at TJUH.

In **nuclear medicine**, a PET-CT will be installed in JCCI, which will provide far superior diagnostic information in oncologic imaging by combining metabolic information with anatomic detail. The demand for oncologic PET imaging will increase with CMS' approval expected in the upcoming year for evaluation of gynecologic malignancies. Additionally, referrals for neurologic PET will continue to increase with CMS' approval of reimbursement for imaging of patient with Alzheimer's dementia.

In **ultrasound**, the utilization of diagnostic and therapeutic musculoskeletal ultrasound is expected to grow from the increasing recognition throughout the greater Delaware Valley of our department as being a leader in the field under the leadership of Dr. Nazarian. The expanded clinical practice will be enhanced with the renovation of a designated musculoskeletal interventional room. In addition, efforts will continue to be made to increase the efficiency of the ultrasound interventional area, which has increased the number of thyroid biopsy procedures performed over the past year, decreasing the backlog. It is our hope that in the upcoming year, ultrasound contrast agents will be approved for clinical use. We should be able to rapidly integrate the contrast-enhanced procedures into our clinical activities based on our strong research efforts in this area.

In the **body CT division**, CT imaging continues to supplant radiographs and
other tests for an increasing number of indications, including pulmonary embolism. While the number of CT scans performed for inpatient follow-up continues to grow, the division will work with clinical services to design imaging algorithms for follow-up of common conditions such as pneumonia, abscess, and pancreatitis. A new 40 slice multidetector CT has been installed on 3 Gibbon and will continue to increase patient throughput and increase the volume of outpatients seen. The new CT will also improve our cardiac CT capabilities and continue to expand this clinical service.

In neuroradiology/head and neck radiology, increased volume of CT perfusion imaging, CT angiography, and advanced MR imaging techniques is expected with the arrival of the new MR and CT scanners. Additionally, the planned placement of a 16 slice CT unit in the Emergency Department and a 3T MR unit in the Jefferson Hospital for Neuroscience will improve our capabilities in imaging critical neurotrauma patients.

**CLINICAL WEAKNESSES**

We face several challenges in our clinical operation. Although we have acquired and installed the replacement of the only in-house MRI and the new 3T, installation was delayed and the units are not yet ready for clinical use. The CT and MR scanners in the Jefferson Hospital for Neurosciences scanners are outdated and will not be replaced until the upcoming fiscal year. As a result, we have continued to be limited in our clinical and research capabilities during the past year.

With ongoing advancements in CT and MRI technology, the on-line image processing needs to be improved in order to demonstrate images in an optimal manner. There remains to be inadequate technologist support for the post-processing of complex CT and MR datasets. The burden of time consuming and complex post-processing has been the responsibility of radiologists. Technologists need to be provided training to become superusers, ensuring the radiologists don’t become the limiting factor in delivery of timely service. There are also information technology issues such as software incompatibilities and PowerScribe limitations that have resulted in inefficiencies. Our PACS continues to be a limiting factor in optimal utilization of a computed radiology system.

We are delighted about the renovations that have begun on 3 Gibbon and 10 Main, yet similar efforts are needed in other areas of the department. There remains a lack of space in nuclear medicine on 8 Thompson. The space occupied by nuclear medicine is suboptimal with no holding area for inpatients. Patients are in wheelchairs and stretchers in the hallway around the reception desk, making the area chaotic. This is a particular problem for the cardiac inpatients, whose stretchers span the hallway of 8 Thompson. This area is in dire need of facility expansion to improve the patient’s experience, thereby maintaining the strong outpatient practice in this hospital setting. On 7 Main in ultrasound, the waiting room for outpatients is in dire need of expansion. In the breast imaging center, there is limited, cramped space, which adversely impacts the effectiveness of the staff and faculty. Plans for consolidating the screening and diagnostic mammography services in renovated space are underway, but leaves the center inefficient for the present time.

There continues to be a nationwide manpower shortage in radiology. Recruitment of new faculty has become
increasingly difficult, as we cannot compete with the higher paying academic institutions and privately owned outpatient centers. We have been able to recruit a number of part-time personnel, but this leaves shortages in weekend and evening coverage. The vacancies in CVIR, neuroradiology, and breast imaging have increased physician workload. The demand for 24 hours a day, 7 days a week radiology services are challenging while also providing interpretation by subspecialty experts to meet the expectations of the referring physicians. In addition, the faculty has less academic time to learn new procedures resulting in only a few faculty members who are relied upon for particular procedures, such as interpreting breast MR, performing MRI guided breast biopsies, sonohysterography, and US-guided RF ablation.

Pediatric radiology continues to be a challenge at Jefferson. Because of the low volume of pediatric cases, we cannot support a pediatric radiologist. Currently, we are utilizing senior conventional radiologists who have sharpened their skills to provide this service. However, this still leaves a void for emergency service for complicated neonatal procedures. These cases must be transferred to duPont or Children’s Hospital of Philadelphia. We welcome collaboration from A.I. duPont pediatric radiologists, and are continuing to have discussions with Dr. Roy Proujansky to find creative solutions. We need to avoid overburdening the pediatric radiologists at duPont, but fully appreciate the need to provide optimal patient care at Jefferson.

CLINICAL INFORMATICS

In addition to the performance and interpretation of imaging examinations, an important responsibility of the Department of Radiology is the management of the large quantity of information generated by the department. The department must provide rapid and convenient access to images and reports for both radiologists and referring physicians, as well as manage the scheduling, performance, billing, and quality control of its services.

During the academic year 2004-2005, informatics initiatives centered on three major projects:

(1) Radiology Information System (RIS) – Installation, testing, and implementation of IDX Imagecast.

(2) Picture Archiving & Communications (PACS) – Development of a detailed specifications and an RFP for a new PACS to replace our ageing Canon PACS, evaluation of PCAS vendors and products, identification of preferred vendors, and negotiations for PACS acquisition.

(3) Development and initial implementation of a strategy to reduce film usage.

These activities were managed by the Radiology Informatics Committee under the leadership of Christopher Merritt, M.D., in concert with the Informatics Technical Team.

Implementation of IDX Imagecast RIS
The Radiology Information System (RIS) is a critical application in the management of scheduling, patient registration, reporting, billing, and workflow. For many years the department has used an internally-developed RIS. In 2003 the Department selected IDX Imagecast as a replacement for our existing RIS. Much of 2004 was spent in preparation for implementation of the new RIS, including detailed workflow evaluation, creation of new data
dictionaries, preparation of data for conversion, interface programming, and user training. Imagecast was successfully implemented at the end of March 2005. Imagecast eventually will interface with our new PACS application, moving the department to a largely paperless workflow, and improving efficiency for clerical personnel, technologists, and physicians. The successful implementation of Imagecast was accomplished with a great deal of effort and cooperation at all levels of the department, requiring major operational and cultural changes, all of which should lead to improved services and better integration of radiology functions with hospital and clinical needs.

PACS replacement
Currently the department relies on a Canon PACS system for digital image management and archiving. This system is no longer supported by the vendor, is unstable, and is inadequate in handling the image loads of our new multidetector CT scanners. In 2003 a process was begun to identify a new PACS vendor. A series of vendor presentations and site visits were performed in late 2003 and throughout the winter and early spring of 2004. As a result of this research, five potential vendors were identified and an RFP for PACS was created. The RFP was unique and was heavily focused on end-user needs rather than technical specifications. This document was presented to selected vendors in August 2004 and responses were evaluated and ranked by the Informatics Committee. In January 2005 the committee identified preferred vendors and submitted its recommendations. Negotiations with the selected vendor are currently in progress, having been delayed by a change in the ownership of the vendor. It is anticipated that a final agreement for acquisition of the new PACS will be completed in the 4th quarter of 2005 with installation to begin in the 1st quarter of 2006.

Reduction of film usage
Of the imaging procedures offered by the Department of Radiology, all but mammography now involve digital data acquisition, display, and storage. Despite the fact that almost all imaging studies are acquired, displayed, and stored digitally, the department continues to print large quantities of film, primarily at the request of patients and referring physicians. Many of the studies requested are cross sectional imaging (CT or MRI) examinations and involve studies consisting of several hundreds of images, requiring not only large amounts of film to reproduce, but also being impractical for viewing. The department has therefore begun transition to the elimination of film copies by replacing these with digital images on CDs. A CD burner has been installed in the radiology film library and procedures are under development to complete the transition from film to digital media in 2005-2006.

In summary, 2004-2005 has been a busy and productive year for the radiology clinical informatics team. We have made progress in several key areas and established an excellent working relationship with the hospital IT team.
EDUCATIONAL PROGRAMS

RADIOLOGY EDUCATION

Medical Student Program
Alfred Kurtz, MD
Director

Course Directors
401: Dinesh Sharma, MD
403: David Friedman, MD
406: Rick Feld, MD
407: Carin Gonsalves, MD
ICM: Terri Tuckman, MD

Diagnostic Radiology Residency Program
Lisa Tartaglino, MD
Director

Nuclear Medicine Residency Program
Charles Intenzo, MD
Director

Fellowship Program and Directors
Catherine Piccoli, MD
Breast Imaging / Women’s Imaging
Joseph Bonn, MD
Cardiovascular/Interventional Radiology
Donald Mitchell, MD
Combined Body MRI/Neuro
Ethan Halpern, MD
Abdominal Imaging
Adam Zoga, MD
Musculoskeletal Radiology
Donald Mitchell, MD
MRI (Body)
David Friedman, MD
Neuroradiology

RESIDENCY TRAINING PROGRAM

The educational programs at Thomas Jefferson University Hospital continue to be one of the major strengths of our department. The Radiology residency program is nationally recognized as one of the top programs in the country. This is indeed a major accomplishment and a tribute to our faculty who remain committed to a high caliber of teaching in spite of faculty shortages and increased clinical workload.

The goal of our residency program is to produce quality radiologists well trained in all aspects of diagnostic radiology. Upon finishing their training, they will be able to comfortably pursue a career in either an academic or private practice environment. All seven of our senior residents passed both the written and 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 all seven have chosen to stay on at Jefferson for additional fellowship training. Our Program Director, Lisa Tartaglino, M.D. has continued to do an outstanding job running the residency program.

Residency Selection: This year we received approximately 550 applications for seven positions and interviewed approximately 75 candidates. We matched all of our positions from among our top candidates. The teaching and research reputation, as well availability of cutting edge technology such as Multidetector CT, PET scanning and imminent 3T MR was crucial for recruitment of our top candidates and made us competitive with other top institutions in the country. Thanks to Dr.
Levon Nazarian, Chairman of the Residency Selection Committee, for these continued outstanding results.

**Resident Research:** 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. A few of our residents deserve special mention. Candace Howard-Claudio M.D., Ph.D. who graduated this year and has demonstrated excellent research capabilities though out her residency, was nominated this year by our department to receive the RSNA Research and Education Foundation Roentgen Resident Research Award which was presented to her at graduation. Her most notable achievement this year was to be the only resident in the country to win the prestigious International Society for Magnetic Resonance in Medicine (ISMRM)/GE Health MRI Fellowship Award. This brought national attention to our Department and clearly spotlighted Dr. Howard as one of the research stars of tomorrow. Another resident, Dr. Bradley Leypold was nominated to participate in the RSNA/ARRS/AUR Introduction to Research Program.

**Clinical Training:** 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. Residents get an outstanding education spending a total of 3 months at A.I. duPont. This rotation enhances the educational experience in pediatric radiology. The addition of cutting edge multidetector CT scanners, an on campus PET scanner and continued upgrades to existing MR’s and Ultrasound units combined with the subspecialty expertise of our faculty ensures up-to-date experience for our residents and fellows. Academy Imaging provides a brief two month exposure to the world of private practice with selected faculty while participating in conventional radiography, mammography and ultrasound.

**Excellence in Teaching Award:** Every year the residents recognize one faculty member for their excellence in teaching. This year’s A. Edward O’Hara award went to Dr. Lisa M. Tartaglino, who is not only Program Director but a member of the Division of Neuroradiology.

**TRAINING PROGRAMS FOR FELLOWS**

Our fellowship programs continued to enjoy another year of excellence. There is an increasing number of extremely well qualified applicants in most of the areas offered by our department including: cardiovascular/interventional radiology, body MRI, breast imaging, combined body 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 is coordinated by Dr. Ethan Halpern with Dr. Alfred Kurtz responsible for the fellow selection process. Fellows are trained in advanced, multi-modality imaging of the abdomen and pelvis, including sonohysterography, virtual colonoscopy and CT/MR urography while continuing to receive training in chest imaging (including cardiac imaging). There is one month of elective time available for additional training in abdominal imaging or training in extra-abdominal cross-sectional work. The program offers seven positions each year.
The Vascular and Interventional Fellowship, under the direction of Joseph Bonn, M.D., is an accredited program and remains very popular. Five choice candidates were selected with three position filled through the fellowship match and two positions filled internally with former Jefferson residents.

The MRI Fellowships, under the direction of Donald Mitchell, M.D., remain popular because of the quality of faculty, the large and diverse case volume, and because this is one of the most rapidly expanding areas of clinical practice. One fellowship position is offered in body/musculoskeletal MRI and four positions in neuro/body/musculoskeletal MRI. In the most recent NRMP match, all of these positions were filled by candidates ranked within the top 10 of the match list from a pool of over one hundred applicants to our programs.

The Musculoskeletal Fellowship program, under the direction of Adam Zoga, M.D., graduated two strong fellows including Laura Zeiller, a former Jefferson resident who accepted a private practice position in Tucson, Arizona, and Gary Oxfeld, who accepted a private practice position in Easton, Pennsylvania. Laura Zeiller presented an original scientific paper at the American Roentgen Ray Society meeting in May, which will be submitted for publication in the *American Journal of Roentgenology*. Additionally, former Jefferson body imaging fellow, Josh Mamelak, completed a subsequent mini-fellowship in musculoskeletal imaging this year. He has joined a private practice in Toronto, Ontario.

The musculoskeletal fellowship positions remain highly coveted as we received more than 35 applications for a single position to be filled through the fellowship match. We filled our remaining positions prior to the match with Jefferson resident Imran Omar. Additionally, we had two externally funded candidates from Ohio and Pennsylvania.

The Neuroradiology/ENT Radiology Fellowship, under the direction of David Friedman, M.D., filled three positions for 2005-2006 through the NRMP match. The division has expanded the training provided to fellows in advanced CT and MR imaging and reconstruction techniques, and will introduce training in 3 Tesla MR imaging in the near future.

The Breast Imaging Fellowship, under the direction of Cathy Piccoli, M.D., offers training in screening and diagnostic mammography, breast ultrasound, breast MRI, and image guided percutaneous needle localization and biopsy using mammography, ultrasound and MRI. Fellows participate in twice monthly Multidisciplinary Breast Cancer Conference and they are responsible for several resident and medical student conferences. Additionally, participation in a research project is encouraged. There were no breast imaging fellows during the 2004-2005 academic year.

Our visiting fellowships remain very popular in the various subspecialty areas; these programs allow practicing radiologists to learn new techniques and sharpen their traditional skills. Because of our international reputation, several physicians from overseas have chosen to pursue their research theses in our department in the divisions of MRI, Neuroradiology/ENT, Ultrasound, etc.

**TEACHING PROGRAMS FOR MEDICAL STUDENTS**

I am pleased that radiology continues to be included in the core curriculum for sophomore students. I wish to thank Terri Tuckman, M.D. and Oksana Baltarowich, M.D. who willingly
contributed their time to this important teaching exercise for Jefferson medical students. Dr. Tuckman continued to serve as the coordinator of this course and has done an outstanding job. The radiology topics presented were Women's Imaging and Abdominal Imaging.

The junior and senior students can choose to attend one or more of the four separate electives offered by our department, which include general radiology, CVIR, neuroradiology/ENT radiology, and ultrasound/CT/MRI. The radiology electives remain quite popular and were completed by 154 members (68%) of the senior class, either here or at an outside institution. Our radiology elective courses are also popular with medical students from other institutions, with 2 students in attendance this year.

The neuroradiology elective was completed by 15 senior medical students. Electives in cross-sectional imaging and CVIR were completed by 9 and 6 students respectively. All of these courses received rave reviews from the students. I wish to thank all the course coordinators for a fine job – Dinesh Sharma, M.D. for general radiology, David Friedman, M.D. for neuroradiology, Rick Feld, M.D. for cross-sectional imaging and Carin Gonslaves, M.D. for CVIR.

CONTINUING MEDICAL EDUCATION PROGRAMS

In spite of all the added pressures of increasing clinical responsibilities, our faculty devote an enormous amount of energy and time to educational activities.

Division of Musculoskeletal and General Radiology: The Jefferson Upper Extremity Advanced Imaging Symposium, directed by Diane Bergin, M.D. was held in February 2005 with 118 attendees.

18th Annual Philip J. Hodes Lecture: In honor of Philip J. Hodes, M.D., the Eighteenth Annual Philip J. Hodes lecture was very successful. The guest speaker was Ronald Arenson, M.D., Alexander R. Margulis Distinguished Professor and Chair of Radiology University of California San Francisco. He gave an outstanding presentation titled “The Future of Academic Radiology”. The lecture was followed by the celebration reception of the Department of Radiology's “100 Years of Excellence”.

Radiology Grand Rounds and Radiology Research Conferences: Thirty-three weekly conferences were held during the 2004-2005 in Radiology, alternating between Grand Rounds and Radiology Research Conference. 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.

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 more than 40 courses offered in all aspects of ultrasound. The annual Leading Edge meeting, which was held at the Taj Mahal Casino Resort in Atlantic City was a success with attendance of greater than 1,300 people. The program was supported by a wide variety of exhibitors and there were lecturers from this country and abroad providing symposia on Ob/Gyn, vascular ultrasound imaging, ultrasound physics, sonomammography, and a
symposium on ultrasound contrast agents.

Educational activities of the division will continue in the coming year to support the training of medical students, residents, and fellows under the leadership of various members of the staff including Ethan Halpern, M.D. A series of conferences in all aspects of ultrasound have been arranged for fellows and residents similar to the past year. Our programs for physicians and paramedical personnel, as well as scientists from around the world continue. Efforts are being made to reduce costs and to expand income.

A grant awarded by the RSNA Research and Education Foundation, "Teaching the Teachers" initiative for Latin America, continues to provide funding for the training of radiologists from the Caribbean, Central and South America at JUREI. Upon completion of the program these radiologists will return to their native countries to establish affiliated ultrasound education centers supported by educational materials and donated ultrasound equipment.

We are also in the process of significantly reducing printing costs by providing education materials on CD-ROM and by reorganizing how we advertise our programs.

**RESEARCH ACCOMPLISHMENTS**

### 2004-2005 Fiscal Year Funding

- **Foundation**: $239,205
- **Industrial**: $129,459
- **Federal**: $1,849,718

### Total Funding (all budget years)

- **Foundation**: $635,208
- **Industrial**: $3,146,046
- **Federal**: $10,995,175
Although the demands of clinical activities continue to increase, with less academic time provided to faculty members, the department’s research productivity remained strong. There were 29 NIH or other federal grants active during the year, in addition to 6 foundation or medical society grants, and another 23 industrial grants. As a group, these grants brought in total current year funding of $2,218,382, including $1,515,651 in direct support and $702,731 in indirect. This represents a 39% increase compared to my first year as chair 3 years ago. We had 193 publications in the medical literature (including journal articles, books and book chapters, and published abstracts) compared with 181 the previous year. Dr. Adam Zoga was awarded the annual Judy Dubbs Memorial Research Award, given to the junior faculty member deemed to be the most productive in research. Additionally, our trainees continued to be productive in quality research, evidenced by Dr. Howard-Claudio being the sole resident in the country to be awarded the prestigious International Society for Magnetic Resonance in Medicine (ISMRM)/GE Health MRI Fellowship Award.

The Jefferson Molecular and Biomedical Imaging Core Facility experienced an increase in the utilization of the small animal PET and CT imaging system, the first state-of-the-art animal molecular imaging equipment on campus. Jefferson investigators studying animal models of neurological diseases, cardiac disorders, and malignant and benign tumors worked with the facility’s expert faculty to address their research questions. Additionally, two Jefferson investigators received federal funding for grants utilizing animal PET imaging were funded during the past year.

The MR physics program, under the leadership of Song Lai, Ph.D., continued to investigate novel MR imaging techniques that provide a new, non-invasive approach to evaluate normal and diseased brain characteristics and functioning. Although working with outdated MR units, the program has been productive and begun to investigate multiple sclerosis, epilepsy, and brain tumor imaging. Jefferson has recently been chosen to participate in the multicenter NIH-funded Alzheimer disease neuroimaging initiative with Dr. Sam Gandy serving as principal investigator, a significant accomplishment that indicates the high level of MR neuroimaging performed within our program.

Our division of diagnostic ultrasound, under the leadership of Dr. Barry Goldberg, continued its exceptional research productivity. A variety of basic science, animal, and clinical research were underway for the development and evaluation of ultrasound contrast agents. Several basic science and animals studies were conducted by Drs. Goldberg, Forsberg, and Liu, all of whom have received federal funding to advance their research interests. Dr. Goldberg’s study is investigating the use of ultrasound contrast agents for imaging lymphatic channels and sentinel lymph nodes in a swine model, while Dr. Forsberg’s is evaluating techniques for the detection of angiogenesis. Dr. Liu is studying contrast ultrasound guided radiofrequency ablation of prostate cancer in a dog model. Dr. Merritt completed animal studies of elastography for his NIH project. The faculty also continued their advances in clinical research with evaluation of traumatic injuries in the liver and spleen by Dr. Patrick O’Kane, an investigation into the diagnosis of breast lesions with
contrast-enhanced ultrasound imaging by Dr. Flemming Forsberg, an examination of prostate cancer diagnosis by Dr. Halpern, and assessment of the use of elastography for thyroid nodule abnormalities.

In breast imaging, Dr. Piccoli continues her efforts on NCI funded cooperative group clinical trials to define the most effective modalities for breast cancer screening. She completed enrollment on a study to examine the efficacy of contralateral breast MRI in women recently diagnosed with breast cancer. Dr. Piccoli also continued recruitment on a trial of the utilization of screening breast ultrasound in a high risk population, as well as a Department of Defense (Army) study to examine the benefits of pendant mammography. Additionally, an industrially funded study to evaluate breast cancer diagnosis with the use of optical imaging, a novel technology which has received a great deal of attention, was initiated.

In nuclear medicine, Dr. Thakur was awarded an NIH grant for a translation study to examine Cu-64 PET imaging of breast cancer using oncogene expression. He continued his work as a co-principal investigator on a DOE-supported project on tumor imaging using gene expression (not listed among our grants because the PI is from another department). Dr. Thakur also began work on the thermo-ablation of colorectal tumors with receptor-targeted nanoshells. Drs. Intenzo and Kim published an article evaluating the role that nuclear imaging plays in the work-up and management of patients with complex regional pain syndrome type I, involving the use of dual-phase total body bone scans, as well as brain SPECT.

In body MRI, Dr. Mitchell continued his efforts on his NIH grant to study the use of MR to evaluate patients with Hepatitis C and enrollment is near completion. Dr. Mitchell, along with other cooperative group investigators, has begun analysis of the ACRIN multicenter trial on early cervical cancer staging. Additionally, Dr. Mitchell has prepared several studies investigating cardiac MR and is anxious to begin those when the 3 Tesla MR unit is ready.

In neuroradiology/ head and neck radiology, Dr. Flanders completed his work on a multicenter trial comparing CT perfusion and MR perfusion in predicting stroke outcomes. Additionally, Dr. Flanders continued his studies of information technology, evaluating the impact of speech recognition and becoming involved in studies to develop nationwide shared health information networks. The division conducted studies on spinal cord injury, function MRI for evaluation of lyrical and nonlyrical music processing, and temporomandibular joint disc derangement.

In body CT, Drs. Halpern, Levin, and Zhang have been investigating coronary CT angiography to diagnose coronary disease and for surgical planning. They have expanded their work to include calcium scoring, ejection fraction analysis, and valvular function. A study to investigate CT findings that are diagnostic of appendicitis was conducted by Drs. Sung, Halpern, and Durrani, while Dr. O’Kane evaluated cardiovascular findings on CT pulmonary angiography.

The cardiovascular interventional radiology division became active in two federally-funded clinical trials. Drs. Sullivan and Eschelman are co-investigators on Dr. Sato’s NIH randomized controlled comparison of immunoembolization and bland embolization in the treatment of uveal
melanoma metastatic to the liver; Dr. Sullivan presented the results of the Phase I trial at the Society of Interventional Radiology annual meeting. Dr. Gonsalves was selected to serve as principal investigator of a multicenter NIH-funded study which examines patient outcomes in renal artery stenting with medical therapy compared to medical therapy alone.

Our musculoskeletal group continued their investigation of a new weight-bearing device to evaluate static and dynamic images of lower extremity joints has provided important clinical information to better understand and more accurately diagnose musculoskeletal abnormalities. Studies examining early detection of osteoarthritis and diabetic foot are underway and if successful could dramatically change patient management. Dr. Morrison deserves special recognition for publishing 10 papers in literature, 9 book chapters, and 10 abstracts.

Our health services research group (Dr. Levin, Dr. Parker, Andrea Frangos and I) continued to be highly productive in studying practice patterns and utilization trends in diagnostic imaging and interventions. With continued funding from the American College of Radiology and the National Coalition for Quality Diagnostic Imaging Services (NCQDIS) our Center for Research on Utilization of Imaging Services (CRUISE) has had nine abstract published and 12 papers either published or accepted for publication. Over the past year we have increased the depth of our research, utilizing more comprehensive administrative datasets. We plan to continue the expansion of our research efforts by examining outcomes as well as utilization. There is no doubt that this work will further enhance the national reputation of our department.

RESEARCH WEAKNESSES

Although we manage to remain successful in our research endeavors, proper research infrastructure (funds and personnel) is necessary to be successful in research today. Continued governmental budgetary restraints makes obtaining federal support increasingly difficult, with the majority of projects requiring two resubmissions to be awarded funding. Additionally, the government is beginning to question how fully-funded researchers can devote effort to pilot projects for new grant submissions when all of their effort is already supported by funded projects. There needs to be financial support to allow investigators to collect pilot data to be considered for funding, including support personnel to work on unfunded pilot clinical trials.

The department has been productive in clinical research, but the research efforts are limited by the amount of time that can be committed by faculty. The clinical workload has been increasing, eroding the academic time to carry out research. The NIH and FDA are promoting the use of radiological endpoints for a wide range of clinical trials, such as oncology and neurology studies. Often the sponsors require complex image evaluations by radiologists, thereby adding research work on studies being conducted by investigators in other departments to our department's clinical workload. More financial support is required to increase the number of faculty members, thereby restoring time to perform our research and assist with the multitude of other studies being carried out at Jefferson.

Trained clinician-researchers are needed to attract both industrial and federal funding. Translational research is a major part of the new NIH roadmap and requires qualified, capable researchers to
carry out this research. With an overall shortage of radiologists nationwide, trained clinician-researchers are in great demand. In this competitive marketplace, we must be able to compete with other institutions to attract these specially trained clinicians.

**OPPORTUNITIES FOR EXTRAMURAL FUNDING**

The department has 20 pending grant proposals, which are listed in Table 2 of the appendix. There are 15 pending proposals for federal grants and/or subcontracts and 5 proposals to industry. The proposals cover a broad spectrum of radiology research. There are also several pending projects outside the department in which our faculty are listed as co-investigators. These are not listed in Table 2 as the principal investigators are faculty members from other TJU departments.

The American College of Radiology Imaging Network (ACRIN), an NCI funded cooperative group, remains a good source of extramural funding for the department. The department has been involved in six projects since the cooperative group’s inception, with one additional project pending. There are additional projects, which are under development at ACRIN, which we hope to participate in. Additionally, many radiology foundations such as the Society of Interventional Radiology Foundation and Radiological Society of North America Research & Education Foundation provide seed grants to gather pilot data for larger grant submissions. The radiology foundations also fund larger projects, such as Dr. Goldberg’s three-year initiative to development and implementation of a program on “Teaching the Teachers,” in the Caribbean, Central and South America.

With the NIH and FDA promoting the use of radiological endpoints for a wide range of clinical trials evaluation of new imaging technologies with outcome and cost-benefit analyses are areas of radiology research that need to be explored. State-of-the-art multi-slice CT systems and MR units are an added resource for obtaining industrial and federal research support. Investigations into the use of CT and MR for cardiac imaging and virtual colonoscopy show great promise. Additionally, our strategic partnership with Philips Medical Systems has been beneficial to departmental research. For example, Ivan Dimitrov Ph.D., an MRI scientist with Philips is stationed in our MRI physics laboratory. There may be an opportunity for our department to serve as a center for education for Philips, with our faculty training physicians and technologists on the latest imaging technique, such as cardiac CT and virtual colonoscopy.

**AFFILIATIONS AND INTERDEPARTMENTAL ACTIVITIES**

Virtually every clinical department utilizes imaging for clinical care of patients as well as research. Joint endeavors between departments build on the strengths of both the departments to produce mutually beneficial programs.

Our physicians continue to work with faculty in other departments across Jefferson campus for both clinical and research endeavors. In breast imaging, radiologists are collaborating with the behavioral epidemiology section of the Department of Medicine to preparing African American women for breast biopsy. Our physicians in CVIR and interventional ultrasound are working closely with several oncologists to investigate the use of hepatic...
chemoembolization, immunoembolization, and radiofrequency ablation in patients with primary and metastatic liver cancer. In musculoskeletal radiology, we are working closely with the Department of Orthopedic Surgery on projects including the shoulder, hip, foot, and spine imaging. Neuroradiologists continue to collaborate with researchers in the Departments of Neurosurgery, Orthopedic Surgery, Neurology, and the Farber Institute. In body MR, radiologists work extensively with the hepatology and transplant groups in the Department of Medicine, even assisting on the development of a new liver-slicing device to assure precise MRI-pathology correlation of explanted livers. The Division of Ultrasound continues to collaborate with investigators from the Departments of Pathology and Clinical Pharmacology in translational research. Dr. Halpern continues his joint effort with the Department of Urology and the Jefferson Prostate Center, while Dr. Nazarian's progress with Dr. McShane from Family Medicine continues to receive wide publicity. In ultrasound, the largest growth percentage of procedures is in vascular imaging, which is a joint service with Vascular Surgery. Cardiac CT and MR show great promise for future collaborations with the Department of Medicine Division of Cardiology.

The Department of Radiology's research collaborations also extend beyond Jefferson. Dr. Piccoli worked with researchers at Geisinger Medical Center, Fox Chase Cancer Center, and Drexel University to examine different aspects of breast disease and diagnosis. Dr. Mitchell continued to collaborate with the MR group at Mt. Sinai Hospital in New York to evaluate high risk individuals for atherosclerotic plaques. The ultrasound and nuclear medicine physics groups collaborated on several projects with investigators at the University of Pennsylvania. Additionally, we continue our close relationships with the engineering departments at both Drexel University and the University of Delaware for undergraduate and graduate training and research.

DEPARTMENT ADMINISTRATION

This past year the administrative infrastructure of our department was reorganized, although no additional manpower was added. While the reorganization helped to streamline some processes, the infrastructure remains extremely thin. The entire administrative team continues to strive to meet the daily challenges of clinical operations, information technology, renovations, new technology applications, and increasing regulations, while welcoming these new opportunities. As we continue to march forward to adopt new advancements in technology, we face many challenges. We must ensure support from our vendors in planning the implementation of our PACS and coordination with our Radiology Information System. It is necessary to have a smooth transition to a completely digital department to make sure patient care does not suffer.

We are very fortunate to have a strong administrative team lead by Victor Sarro. Both Richard Blob and Pete Natale are highly dedicated individuals with outstanding work ethics. As the chief technologist, Pete continues to oversee the advanced CT and MRI applications. However, the role of the administrative team in the functioning of a radiology department is not to be underestimated. They are not only the face of the department representing radiology in interactions with patients and referring physicians, but also critical to the success of our practice. They also perform the coding, billing, and revenue collections. As we continue to expand our clinical operations and move towards a state-of-
the-art department in both imaging applications and information technology, I am fortunate to have this administrative team. I am confident that they are up to the challenge and excited about the developments in progress, but additional resources must be made available for an endeavor of this magnitude.

DEPARTMENT GOALS

Retain and recruit faculty — To continue our success in clinical, research, and academic endeavors, the Department of Radiology must retain the motivated and dedicated faculty who have helped to build this department, as well as recruit enthusiastic young faculty who will uphold its success in the future. When new faculty are recruited, we must ensure there are enough faculty members to prevent burnout. With the current shortage of radiologists and the competitive salaries offered by private practice, as well as at some other academic centers, this is a challenging goal for an academic radiology department. Physicians who choose careers in academic medicine do so to be on the cutting edge of medicine and to advance their field through research and/or educational activities. With the continued budgetary constraints that the institution faces, faculty members are expected to increase their clinical productivity and accept less time to pursue their research and educational goals, thereby making private practice more attractive. One of the most essential goals of the department will be to continue to retain our current faculty and recruit new faculty with academic potential and skilled in newer imaging techniques, such as cardiac CT and breast MR. This will require providing competitive compensation, as well as adequate time and infrastructure for the faculty to pursue their academic endeavors.

To become a state-of-the-art department — The department has made great advancements over the past two years, we have acquired and installed two 16-slice multidetector CT scanner, a new 3.0 Tesla MR, and a 1.5 Tesla MR to replace the antiquated MR on 10 Main, which used to serve as the only inpatient MR unit in the hospital. Additionally, a PET-CT scanner is planned for installation at the Jefferson Center City Imaging Center on campus. One of our major goals in the upcoming year is to continue our progress towards a state-of-the-art department. We must continue to improve our services, providing the Jefferson community with new, advanced imaging technology. During the next few months, it is expected that the new MR units will be ready for clinical use. There are plans to install a 40-slice CT unit on 3 Gibbon, relocating one of the 16-slice systems to the Emergency Department. Additionally, a new CT and 3 Tesla MR will be installed in JHN. Yet, a successful department requires more than only state-of-the-art equipment. The renovations on 3 Gibbon will provide for an improved experience for both patients and referring physicians. A warm, patient friendly facility with improved waiting facilities and efficient and effective operations will serve as the most important public relations opportunity for the department for several years. A centralized reading room and a dedicated consultation area will serve to increase the efficiency of the department, as well as referring physicians. The planned renovations and equipment acquisitions will position Jefferson at the forefront of imaging services in the Philadelphia area.

To become a digital department — The Department of Radiology continues to make progress towards its goal, but replacement of our outdated PACS lags behind. The department's Informatics Committee, working in close collaboration
with TJUH, has identified a vendor of choice, but unfortunately changing landscape in the PACS industry has caused delays in the acquisition. Imagecast was successfully implemented over the past year, save challenges in the mammography division. An upgrade to the Imagecast system is imminent and will make the system more user-friendly. While the mammography division continues to utilize film for primary image acquisition, the new breast care center will allow us to transition from screen film to digital mammography. This conversion would make us a completely filmless department, which will be a huge accomplishment. A digital radiology department is important not only to us, but to the university and entire institution as a whole by improving departmental efficiency and productivity, reducing expenses, and increasing the availability of diagnostic images for clinicians.

**Expand the clinical practice** – Last year was another very strong year in the clinical practice. We must aggressively explore new business opportunities and become involved in mutually advantageous joint ventures with the hospital to maintain our success. With the acquisition of the new 3T and 1.5T magnet, as well as advanced CT scanners which allow us to perform coronary CTA and virtual colonoscopy, we have the opportunity to offer cutting edge clinical services on state-of-the-art equipment. In addition to increasing our market share in Center City, we should target new populations outside the city, aligning with the regional strategic plan of the university. Currently we provide services for Langhorne MRI Center owned by InSight. In the upcoming year, InSight plans to begin expansions to become a multi-modality imaging center with Jefferson Radiology providing the services. Similar to the InSight arrangement, we are now exploring an opportunity to provide services at another multi-modality center in the Langhorne area that is operated by Medical Resources. We are also eager to provide radiology services at Methodist Hospital in South Philadelphia. Negotiations with Radiology South Philadelphia (RSP), a private group at Methodist Hospital, are in progress to create a community radiology division of JUP radiology. Additionally in the South Philadelphia area, we are in the process of evaluating the feasibility of an outpatient imaging center as a joint venture with Methodist Hospital and TJUH.

**Strengthen departmental infrastructure** – As an academic service department, we are expected to provide 24 hour a day expertise of various imaging subspecialties to the entire Jefferson community, while continuing to pursue research and academic endeavors. With the continued budgetary constraints that the institution faces, support staff for faculty has been downsized drastically. Therefore, faculty members must now assume various clinical and administrative tasks, which adversely impact their clinical, research, and educational productivity. We need to develop creative solutions to the additional tasks that faculty are now faced with, such as the training of radiology technologists to perform the image post-processing for CTA studies. Additional solutions must be considered to ensure continued efficiency of the department.

**Preserve excellence of training programs** – As a nationally recognized training program, our radiology educational programs continue to recruit the highest caliber residents and fellows. The high quality of services we provide to the Jefferson community is directly related to the caliber of our trainees.
therefore must continue to provide high quality educational programs to medical students, residents, fellows, and visiting physicians to enable us to continue to attract the best trainees. This goal is dependent upon our ability to retain and recruit dedicated faculty and to provide that faculty the time for educational activities. The future of the field of radiology depends on the quality of training we provide to our residents and fellows and therefore, maintaining the educational program will remain a goal of the department.

Enhance research programs — Two significant research goals were achieved over the past two years with the establishment of the MR physics program and the Jefferson Molecular and Biomedical Imaging Core Facility. These two programs are a first step towards the development and enhancement of imaging research at Jefferson. They are central to the efforts across the campus to enhance the research reputation of Jefferson and increase the research productivity of the medical school. The new programs have the ability to improve research within the department, allow collaborative research between radiology and other departments in the university, and significantly increase our ability to improve the level of extramural funding in the department and university as a whole. While we must continue to make it a priority to promote these projects, we must expand our translational research capabilities. Additionally, a major goal of our department will be to further develop our research partnership with Philips Medical Systems, becoming a premier designation as a beta site for new technology evaluation. One of Philips MRI scientists is stationed here at Jefferson and works very closely with Song Lai, Ph.D., director for MRI research in our department.

Breast care center — As noted earlier in this report, TJUH leadership has targeted expansion of the breast cancer program. The Jefferson Breast Center will consolidate breast imaging and treatment modalities into a patient-centered facility that is personalized and private, and will offer state-of-the-art equipment. A center like this will be a resource to the entire Jefferson community, emphasizing a multidisciplinary approach to breast cancer. It is our goal to recruit an academic leader to act as the director of breast imaging in this center.

ISSUES FOR THE COLLEGE, UNIVERSITY AND HOSPITAL

TJU, TJUH, JUP — Dr. Barchi’s arrival has created a positive environment at Jefferson. He looked to the faculty when beginning his strategic planning process, creating an exciting and encouraging climate. This is now the time to make positive changes throughout the Jefferson system. With the market share of TJUH down, there needs to be an expansion of clinical practice outside of central Philadelphia. Jefferson needs to take a regional strategy, as the Department of Radiology has already done to some extent with our satellite centers. Ambulatory surgical centers should be established to move the more routine procedures into an outpatient setting and making existing resources available to provide tertiary care at TJUH. Methodist Hospital in South Philadelphia presents an extraordinary opportunity for expansion of Jefferson’s clinical practice. Jefferson needs to facilitate the creation of community divisions in JUP departments that will be attractive for graduating fellows who wish to stay grounded in an academic setting, but prefer to devote their efforts in clinical practice and teaching residents. A
community division would only be worthwhile if it was designed with the modified tax structure that would not have to provide resources to support research.

**Joint ventures (TJU, TJUH, JUP)** — Jefferson Center City Imaging Center, the first joint venture between TJUH and JUP on campus in Radiology has been highly successful. This model needs to be expanded to other areas in Radiology, as well as other departments and divisions. Support of this collaboration from TJU, TJUH, and JUP has been essential and future joint ventures need to receive the same commitment from the institution, thereby gaining the commitment of the physicians. It is a win-win situation for all involved.

**JUP** — JUP is redefining itself under the leadership of Dr. William Keane as Physician Director and John Ogunkey as the Executive Director. An entirely new governance structure has been chiseled out under which chairs have agreed to relinquish some of their authority. This represents a huge culture change at Jefferson and is a testimony to the confidence department chairs have demonstrated in the new leadership of JUP and TJU. It is encouraging that faculty will have an opportunity to be more active in the governance of JUP at various levels and have a sense of ownership. Additionally, the faculty will have the ability to influence the direction in which the Institution is being steered.

**Centers of Excellence** — It is my hope that JUP leadership will be able to provide momentum for converting imaging turf battles into productive joint ventures. At many institutions, Cardiology and Radiology are recognizing the need to collaborate and are creating complementary enterprises that can maximize patient care. We need to create similar momentum at Jefferson and create a joint venture in advanced cardiovascular imaging.

**Endowed Chair** — Several of the clinical departments here at Jefferson have an endowed chair or professorship. The Department of Radiology is an exception unfortunately. I feel it is important that we have an endowed chair. Radiology has made huge financial contributions to the University over several years, which have not received recognition. We have thus far paid a far higher dean's tax than any other department amounting to millions of dollars. We had also built up a reserve of over $6 million, which was appropriated by the University. I feel it is justified to request that an endowed chair be established which would lend an appropriate recognition due our department. It is my hope that the Institutional Advancement Office will work closely with us to identify potential donors to create several endowed professorships in the department.
PUBLICATIONS

Journal Articles:


Books and Book Chapters:


Abstracts:


90. Beideck D, Gingold E: Investigation of self-developing film for collimation assessment in

91. Bergin D, Morrison WB, Zoga AC, Sanders TG: Patterns of biceps tendon displacement and
associated subscapularis tendon and osseous pathology on MR imaging of the shoulder.
*Proceedings of the 90th Scientific Assembly and Annual Meeting of the Radiological Society of

contrast agents: Effect on enhancement. *Proceedings of the 31st Annual Northeast

93. Cardi CA, Acton PD, Thakur ML, Karp JS: Evaluation of PET-CT mutual information
registration in mice. *Proceeding of 52nd Annual Meeting of the Society of Nuclear Medicine,
Toronto, Canada*, June 2005.

derivation of a prediction model to discriminate benign from malignant vertebral compression
fractures using magnetic resonance imaging feature analysis. *Proceedings of the 90th
Scientific Assembly and Annual Meeting of the Radiological Society of North America*, Chicago,
IL, November-December 2004.

95. Chakrabarti A, Aruva MR, Sanjankila SP, Thakur ML, Wickstrom E: Synthesis of novel PNA-
peptide chimera for noninvasive imaging of cancer. *Proceedings of the International Society for
Nucleosides, Nucleotides, and Nucleic Acids XVI International Round Table Conference,

96. Chakrabarti A, Aruva MR, Zhang K, Mathew B, Fong DT, Thakur ML, Wickstrom E: External
imaging of oncogene KRAS mRNA overexpression in pancreatic cancer xenografts with Tc-99m
and Cu-64 chelator PNA-peptide chimeras. *Proceeding of 52nd Annual Meeting of the Society
of Nuclear Medicine*, Toronto, Canada, June 2005.

97. Chakrabarti A, Aruva MR, Zhang K, Thakur ML, Wickstrom E: Tc-99m and Cu-64 PNA-peptide
hybridization probes for imaging of oncogene activation in pancreatic cancer. *Proceedings of the 96th Annual Meeting of the American Association of Cancer Research,

98. DeJesus JO, Nazarian LN, Parker L, Maitino AJ: Diagnostic imaging of rotator cuff tears: A
meta-analysis of the accuracy of US and MR. *Proceedings of the 90th Scientific Assembly and
Annual Meeting of the Radiological Society of North America*, Chicago, IL, November-
December 2004.

cardiovascular MRI using radial TRUE-FISP acquisitions, real-time catheter tracking, and
adaptive imaging parameters. *Proceedings of the 90th Scientific Assembly and Annual Meeting

monitored renal artery stenting using only MRI. *Proceedings of the 13th Scientific Meeting of
the International Society for Magnetic Resonance in Medicine, Miami, FL*, May 2005.


OKSANA H. BALTAROWICH, M.D.

September 28-29, 2004
American College of Osteopathic Obstetricians & Gynecologists – ACOOG
Fall Conference, Philadelphia, PA
- “Ultrasound of the normal and abnormal uterus”
- “Ultrasound of the normal and abnormal ovary”

January 4-7, 2005
Practical Approach to Diagnostic Ultrasound in Obstetrics/Gynecology and Abdomen, sponsored by Al Mousa Medical Center, Dubai, UAE
- “Sonography of normal abdominal vessels”
- “Sonography of the normal liver”
- “Sonography of the diffusely abnormal liver, including portal hypertension”
- “Ultrasound evaluation of RLQ pain”
- “Sonography of TIPS”
- “Renal abnormalities (excluding masses)”
- “Sonography of cystic renal masses”
- “Sonography of solid renal masses”
- “Transvaginal sonography of the pelvis”
- “Early pregnancy failure: Most useful signs”
- “Normal fetal anatomy”
- “Fibroids: Easy and difficult to diagnose”
- “Update on ovarian cancer ultrasound”

April 20, 2005
A Practical Approach to Ultrasound in Obstetrics & Gynecology, sponsored by Minnesota Perinatal Physicians, Allina Hospital & Clinics, Minneapolis, MN
- “How to avoid pitfalls in transvaginal sonography of the pelvis”
- “Ultrasound evaluation of myometrial disorders”
- “Ultrasound evaluation of ectopic pregnancy”

May 10-13, 2005
The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
- “Sonographic spectrum of hemorrhagic ovarian cysts”
- “Sonographic findings in ovarian torsion”

DIANE C. BERGIN, M.D.

November 28-December 3, 2004
90th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- “Abnormalities of the subscapularis tendon in the presence of a full thickness tear of the supraspinatus tendon”

February 12-13, 2005
Jefferson Upper Extremity Imaging Symposium, Philadelphia, PA
- “Imaging the rotator cuff”
May 10-13, 2005  
The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ  
- "Imaging the female pelvis: When is it appropriate to recommend MRI?"

**RICK I. FELD, M.D.**

May 10-13, 2005  
The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ  
- "Ultrasound-guided interventional procedures in the female pelvis"  
- "Diagnosis and management of vascular injuries"

**ADAM E. FLANDERS, M.D.**

November 28-December 3, 2004  
90th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL  
- "Imaging of spinal trauma and spinal cord injury" (refresher course)  
- "How your radiology practice can 'work the web'" (refresher course)  
- "Introduction to PowerPoint presentations: Basic skills" (refresher course)  
- "Introduction to PowerPoint presentations: Advanced skills" (refresher course)  
- "How to get radiologic images into your personal computer" (refresher course)  
- "Intermediate PowerPoint" (refresher course)  
- "CAD and clinical database solutions" (co-moderator)  
- "PACS: Cost, security, and ergonomics" (co-moderator)  
- "Carotid artery disease" (co-moderator)  
- "Advances in mobile computing in radiology"  
- "How to author MIRC teaching files"

February 24-27, 2005  
American Society of Spine Radiology Annual Symposium, San Juan, Puerto Rico  
- "Update on clinical imaging of spine trauma and spinal cord injury"

March 18-19, 2005  
4th Annual Cerebrovascular Update: Prevention Strategies and Management of Acute Stroke, sponsored by Thomas Jefferson University Hospital, Philadelphia, PA  
- "Advances in imaging in acute cerebrovascular disease"

May 21-27, 2005  
43rd Annual Meeting of the American Society of Neuroradiology, Toronto, Canada  
- "Personal technologies and the radiologist"

June 3, 2005  
25th Annual Meeting of the Society of Computer Applications in Radiology, Orlando, FL  
- "MIRC and electronic teaching files"
**FLEMING FORSBERG, PH.D.**

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<th>Date</th>
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| July 20, 2004   | Advanced Logiq 700 Technology, GE Medical Systems, Milwaukee, WI                                | • “New developments in ultrasound contrast imaging”  
                 |                                                                                                 | • “Advances in vascular 3D ultrasound imaging”                                                     |
| August 24-27, 2004 | 2004 IEEE International Ultrasonics, Ferroelectrics and Frequency Control 50th Anniversary Joint Conference, Montreal, Canada | • “Perfusion estimation using subharmonic contrast microbubble signals”  
                 |                                                                                                 | • “Volume flow measurements with a novel semi-automated 4D Doppler ultrasound scanner” (poster)  |
| September 28-29, 2004 | American College of Osteopathic Obstetricians & Gynecologists – ACOOG Fall Conference, Philadelphia, PA | • “Principles of ultrasound: An introduction”                                                      |
| October 15, 2004 | Visiting Professor, Department of Radiology, Veterans General Hospital, Taipei, Taiwan          | • “Elastography and tissue strain imaging”                                                         |
| October 15, 2004 | Visiting Professor, Institute of Bioengineering, National Yang-Ming University, Taipei, Taiwan | • “Subharmonic contrast signals for imaging and quantitative measurements”                         |
| October 16, 2004 | Seminar in Ultrasound, Radiological Society Republic of China, Taipei, Taiwan                    | • “Monitoring angiogenesis with ultrasound and contrast”                                           |
| October 16-17, 2004 | 20th Annual Convention of the Society of Ultrasound in Medicine of the Republic of China, Taipei, Taiwan | • “Elastography and tissue strain imaging”  
                 |                                                                                                 | • “Subharmonic contrast signals for imaging and quantitative measurements”                     |
| October 19, 2004 | Visiting Professor, Department of Ultrasound in Medicine, Number 6 People’s Hospital, Shanghai, China | • “Subharmonic contrast signals for imaging and quantitative measurements”                       |
| October 20, 2004 | Visiting Professor, Department of Ultrasound, Number 4 People’s Hospital, Suzhou, China          | • “Ultrasonic biomedical technology: Marketing versus clinical reality”                           |
| October 21, 2004 | Visiting Professor, Department of Ultrasound, Number 117 Military Hospital, Hangzhou, China     | • “Ultrasound imaging technology: Marketing versus clinical reality”                              |
| October 23, 2004 | Visiting Professor, Department of Sonography, Huaxi University, Chengdu, China                   | • “Elastography and tissue strain imaging”  
                 |                                                                                                 | • “Introduction to ultrasound imaging technologies”                                               |
October 29, 2004  Ultrasound Seminar, The Great Hall of the People, Beijing, China
• “Advances in ultrasound imaging technologies”

November 16, 2004  Advanced Logiq 700 Technology, GE Medical Systems, Milwaukee, WI
• “New developments in ultrasound contrast imaging”
• “Advances in vascular 3D ultrasound imaging”

November 28 - December 3, 2004  90th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
• “Principles of Doppler imaging”
• “Validating volume flow estimation with a novel semi-automated 4D Doppler US system”

December 11-12, 2004  6th International Symposium on Ultrasound Contrast Imaging, Tokyo, Japan
• “Contrast imaging for sentinel lymph node identification”

March 4-5, 2005  10th Ultrasound Contrast Research Symposium in Radiology, San Diego, CA
• “Novel nonlinear contrast imaging modes for breast lesion characterization”
• “Contrast-enhanced ultrasound for monitoring radiofrequency ablation of prostate”
• “Micro flow imaging (MFI) and vascular recognition imaging (VRI) of Tumor neovascularity in animal models”

April 12, 2005  Advanced Logiq 700 Technology, GE Medical Systems, Milwaukee, WI
• “New developments in ultrasound contrast imaging”

May 10-13, 2005  The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
• “Novel nonlinear contrast imaging modes for breast lesion characterization”
• “Contrast enhanced breast imaging”
• “Technical advances in ultrasound and Doppler: Myths and realities”

June 19-22, 2005  50th Annual Convention of the American Institute of Ultrasound in Medicine, Orlando, FL
• “Carotid ultrasound with a novel semi-automated 4D Doppler system”
• “Contrast specific imaging of normal microvessels and tumor neovascularity in animal models”
• “In vitro and in vivo perfusion estimation using subharmonic ultrasound signals”

DAVID P. FRIEDMAN, M.D.

October 7-9, 2004  Neuroradiology: The Essentials, sponsored by University of Pennsylvania Medical Center, Philadelphia, PA
• “Infectious diseases”
• “Imaging of arachnoiditis”
December 8, 2004

Visiting Professor, Department of Radiology, New York Presbyterian Medical Center, New York, NY
- “Imaging of infectious diseases of the brain” (grand rounds)
- “Vascular lesions of the spinal cord”
- Resident board review

BARRY B. GOLDBERG, M.D.

September 28-29, 2004
American College of Osteopathic Obstetricians & Gynecologists – ACOOG Fall Conference, Philadelphia, PA
- “Normal and abnormal ultrasound of the uterus”
- “Normal and abnormal ultrasound of the ovary”

October 25, 2004
Ultrasound Centre CCS, Belgrade, Serbia
- “Advances in ultrasound contrast imaging”
- “New techniques in ovarian ultrasonography”

October 28-29, 2004
Society of Radiologists in Ultrasound, Washington, DC
- “Update on lymphosonography”
- “Ultrasound technology and contrast agents – Present and future”

November 28-December 3, 2004
90th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- “Radiology triage of trauma during the war and peace”

April 16, 2005
Basic Concepts in Urology Lecture Series, University of Pennsylvania Medical Center, Philadelphia, PA
- “Ultrasound in urology”

May 10-13, 2005
The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
- “Lymphosonography – An update”
- “Future trends in Ob/Gyn imaging”
- “Advances in 3D vascular ultrasound imaging”

May 24-29, 2005
Second Congress of Romanian Society of Ultrasound in Medicine and Biology, Cluj, Romania
- “Contrast agents in ultrasonography”

June 19-22, 2005
50th Annual Convention of the American Institute of Ultrasound in Medicine, Orlando, FL
- “The history of ultrasound”
- “Images of yesterday and today”
- “Combined peritumoral and intravenous administration of contrast to evaluate sentinel lymph nodes”

ETHAN J. HALPERN, M.D.

October 13, 2004
Department of Radiology Grand Rounds, Bryn Mawr Hospital, Bryn Mawr, PA
- “Doppler evaluation of arterial flow patterns”
November 28-December 3, 2004  
90th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL  
- "Prostate cancer detection with targeted biopsy during contrast-enhanced sonography"  
- "Detection of prostate cancer with contrast-enhanced sonography using harmonic gray scale, color Doppler, and power Doppler imaging"

March 9, 2005  
Department of Radiology Grand Rounds, Bryn Mawr Hospital, Bryn Mawr, PA  
- "CTA of the coronary arteries"

March 9, 2005  
Department of Radiology Grand Rounds, Graduate Hospital, Philadelphia, PA  
- "The good, bad and pitfalls of coronary CT angiography"

May 10-13, 2005  
The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ  
- "Prostate cancer detection with contrast"

CHARLES M. INTENZO, M.D.  
June 18-22, 2005  
52nd Annual Meeting of the Society of Nuclear Medicine, Toronto, Canada  
- "The prevalence of well-differentiated thyroid cancer in nontoxic multinodular goiter: Results of a multi-year analysis"  
- "Is the incidence of radioiodine-induced radiation gastritis proportional to the dose of I-131 administered?"  
- "Optimizing brain SPECT: A step-by-step pictorial guide and clinical cases" (educational exhibit)

DAVID KARASICK, M.D.  
February 12-13, 2005  
Jefferson Upper Extremity Imaging Symposium, Philadelphia, PA  
- "Radiographic evaluation of the shoulder"  
- "Radiographic evaluation of the elbow and wrist"

May 15-20, 2005  
American Roentgen Ray Society 105th Annual Meeting, New Orleans, LA  
- "Musculoskeletal: Hip and pelvis" (moderator)

STEPHEN KARASICK, M.D.  
September 27, 2004  
Novartis Center of Excellence Program, Novartis Pharmaceuticals, Philadelphia, PA  
- "Introduction to IBS"

November 15, 2004  
Novartis Center of Excellence Program, Novartis Pharmaceuticals, Philadelphia, PA  
- "Introduction to IBS"
SUNG M. KIM, M.D.

January 15-19, 2005  
31st Annual Meeting of the American College of Nuclear Physicians, San Diego, CA  
• "The role of 18f-FDG PET scan in the patients presenting with neck masses with unknown primary tumor" (poster)

June 18-22, 2005  
52nd Annual Meeting of the Society of Nuclear Medicine, Toronto, Canada  
• "Evaluation of the relationship between lung malignancy and the primary head and neck cancer by PDG-PET" (poster)

SONG LAI, PH.D.

August 11-13, 2004  
Annual Biomedical Engineering Research Conference of the Whitaker Foundation, San Diego, CA  
• "Optimized MRI techniques for quantitative assessment of brain tumor functional characteristics" (poster)

August 21, 2004  
2nd Greater China MR Research Conference, Beijing, China  
• "Perfusion MRI" (plenary talk)

May 7-13, 2005  
13th Scientific Meeting of the International Society for Magnetic Resonance in Medicine, Miami, FL  
• "Model free fMRI detection of neural activation in the temporal frequency domain" (poster)

ANNA S. LEV-TOAFF, M.D.

July 23, 2004  
Department of Radiology Grand Rounds, Vanderbilt University, Nashville, TN  
• "Understanding uterine malformations"

July 24-25, 2004  
28th Annual Diagnostic Sonography Symposium, sponsored by Vanderbilt University, Nashville, TN  
• "Gynecologic 3D sonography – Part 1"  
• "Gynecologic 3D sonography – Part 2"

September 13, 2004  
Northeast Ohio Ultrasound Society, Cleveland, OH  
• "Sonohysterography"  
• "Challenging cases in pelvic imaging"

October 31, 2004  
Society of Radiologists in Ultrasound, Washington, DC  
• "Hormone replacement therapy: Changing trends and how it affected study of postmenopausal bleeding"
November 28-December 3, 2004
90th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- "Problem solving in the female pelvis: Making a more specific diagnosis"

May 10-13, 2005
The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
- "Three-dimensional ultrasound: A problem-solving tool in gynecology"

May 19-21, 2005
Eighteenth International Conference for Nurses and Support Personnel in Reproductive Medicine, New Orleans, LA
- "Transvaginal sonography in reproductive endocrinology"

June 16, 2005
3D Ultrasound in Obstetrics and Gynecology Consensus Forum, hosted by the American Institute of Ultrasound in Medicine, Orlando, FL
- "Three dimensional evaluation of uterine abnormalities"

June 19-22, 2005
50th Annual Convention of the American Institute of Ultrasound in Medicine, Orlando, FL
- "Three-dimensional ultrasound of the uterus"

JI-BIN LIU, M.D.

August 5, 2004
Visiting Professor, Second Hospital of Chongqing Medical University, Chongqing, China
- "Contrast-enhanced ultrasound imaging — An updated review"
- "How to write an English abstract"

August 9, 2004
Visiting Professor, Department of Radiology, Huaxi Hospital of Sichuan University, Chengdu, China
- "Interventional ultrasound — Diagnosis and treatment"
- "How to write an English abstract"

October 15, 2004
Visiting Professor, Department of Radiology, Veterans General Hospital, Taipei, Taiwan
- "Interventional ultrasound — Diagnosis and treatment"

October 16, 2004
Seminar in Ultrasound, Radiological Society Republic of China, Taipei, Taiwan
- "Contrast-enhanced ultrasound for monitoring radiofrequency ablation of prostate"

October 16-17, 2004
20th Annual Convention of the Society of Ultrasound in Medicine of the Republic of China, Taipei, Taiwan
- "Contrast-enhanced ultrasound imaging of lymphatic system"

October 19, 2004
Visiting Professor, Department of Ultrasound in Medicine, Number 6 People's Hospital, Shanghai, China
- "Contrast-enhanced ultrasound imaging: Vascular and nonvascular applications"
- "How to write an abstract in English for medical imaging articles"
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<td>Suzhou, China</td>
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<td>2004 Kunming International Ultrasound Symposium, Kunming, China</td>
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<td>Society of North America, Chicago, IL</td>
<td>• “Contrast-enhanced US for monitoring radiofrequency ablation of</td>
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<td>canine prostate: Initial results”</td>
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<td>for breast cancer staging”</td>
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<td>April 22, 2005</td>
<td>Visiting Professor, Department of Ultrasound, Qingdao Second Hospital,</td>
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<td>Qingdao, China</td>
<td>• “Interventional ultrasound”</td>
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<td>• “Contrast-enhanced ultrasound imaging: Vascular and nonvascular</td>
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<td>applications”</td>
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<td>April 27, 2005</td>
<td>Ultrasound Education Center, Huaxi Hospital, Chengdu, China</td>
<td>• “Intraoperative ultrasound”</td>
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<td>• “New advances in ultrasound imaging for breast cancer”</td>
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<tr>
<td>May 10-13, 2005</td>
<td>The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas</td>
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<td>Jefferson University Hospital, Atlantic City, NJ</td>
<td>• “Monitoring prostate ablation with contrast”</td>
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</tbody>
</table>
CHRISTOPHER R.B. MERRITT, M.D.

September 18, 2004  Johns Hopkins Ultrasound, sponsored by Johns Hopkins University, Baltimore, MD
  • “Understanding Doppler”
  • “Breast lesion assessment”
  • “Carotid ultrasound”

May 10-13, 2005  The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
  • “Breast ultrasound: Physics”
  • “Breast ultrasound: BIRADS”
  • “Doppler quiz”

May 25, 2005  Society of Breast Imaging, Vancouver, Canada
  • “Sentinel node evaluations”

DONALD G. MITCHELL, M.D.

September 2-5, 2004  Tianjin International MRI Symposium, Tianjin, China
  • “Current trends and developments in MRI”

October 21, 2004  New York University Research Seminar, New York, NY
  • “Cirrhosis: Evolving concepts using MRI”

November 28-December 3, 2004  90th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
  • “Liver MR imaging: Technique and advanced imaging”
  • “MR imaging of diffuse liver diseases: Comprehensive review of findings and clinical implications”

February 12-13, 2005  Jefferson Upper Extremity Imaging Symposium, Philadelphia, PA
  • “Optimizing MSK protocols”

February 23, 2005  Visiting Professor, Department of Radiology, University of Maryland, Baltimore, MD
  • “Liver MRI”

May 7-13, 2005  13th Scientific Meeting of the International Society for Magnetic Resonance in Medicine, Miami, FL
  • “The hepatitis C patient: Early diagnosis of cirrhosis and HCC”

May 15-20, 2005  American Roentgen Ray Society 105th Annual Meeting, New Orleans, LA
  • “Focal liver lesions: MR imaging”

WILLIAM B. MORRISON, M.D.

August 19, 2004  Armed Forces Institute of Pathology, Washington, DC
  • “MR imaging of the elbow”
<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Location</th>
<th>Topics</th>
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<tbody>
<tr>
<td>October 20, 2004</td>
<td>Department of Radiology Grand Rounds, Hartford Hospital, Hartford, CT</td>
<td>• &quot;Imaging of arthritis&quot;</td>
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<td>• &quot;Interesting cases&quot;</td>
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<td>• &quot;MRI of the hip&quot;</td>
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<td>October 23, 2004</td>
<td>Pennsylvania Radiological Society Annual Meeting, Philadelphia, PA</td>
<td>• &quot;MRI of the elbow&quot;</td>
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<td>November 28-</td>
<td>90th Scientific Assembly and Annual Meeting of the Radiological Society</td>
<td>• &quot;Use of dynamic contrast enhance MR imaging (DCEMRI) for evaluation of diabetic foot infection&quot;</td>
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<td>December 3, 2004</td>
<td>of North America, Chicago, IL</td>
<td>• &quot;Evaluation of the post-operative shoulder&quot; (refresher course)</td>
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<td>• &quot;Imaging of spinal trauma&quot; (refresher course)</td>
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<tr>
<td>January 27-28, 2005</td>
<td>Department of Radiology Grand Rounds, University of Virginia, Charlottesville, VA</td>
<td>• &quot;Imaging of arthritis&quot;</td>
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<td>• &quot;Boards review&quot;</td>
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<td>• &quot;MR imaging of the diabetic foot&quot;</td>
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<td>February 6-8, 2005</td>
<td>Practical Musculoskeletal MRI in the Desert, sponsored by University of California San Francisco School of Medicine, Rancho Mirage, CA</td>
<td>• &quot;MRI of muscle&quot;</td>
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<td>• &quot;MRI of the forefoot&quot;</td>
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<td>• &quot;MRI of infection&quot;</td>
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<td>• &quot;MR arthrography&quot;</td>
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<td>• &quot;MRI of the post-operative shoulder&quot;</td>
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<td>February 6-11, 2005</td>
<td>7th Annual Radiology at the Seashore: A Practical Update, sponsored by University of Michigan, Naples, FL</td>
<td>• &quot;Imaging of arthritis&quot;</td>
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<td>• &quot;MRI of the painful hip&quot;</td>
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<td>• &quot;Optimization of musculoskeletal MRI&quot;</td>
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<td>• &quot;MRI of the spine: Nomenclature of disc disease and injury patterns&quot;</td>
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<td>• &quot;Case review&quot;</td>
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<td>March 5-7, 2005</td>
<td>7th Annual Hand Surgery Symposium: The Elbow: An Unforgiving Joint, Philadelphia, PA</td>
<td>• &quot;MRI of the elbow&quot;</td>
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<tr>
<td>March 11, 2005</td>
<td>Armed Forces Institute of Pathology, Washington, DC</td>
<td>• &quot;MR imaging of the elbow&quot;</td>
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<tr>
<td>March 13-16, 2005</td>
<td>Society of Skeletal Radiology Annual Meeting, Orlando, FL</td>
<td>• &quot;Arthroereisis: Indications and imaging&quot;</td>
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<td>April 17-20, 2005</td>
<td>Practical Applications of New Imaging Techniques, sponsored by Harvard Medical School, Boston, MA</td>
<td>• &quot;Optimization of musculoskeletal MR imaging protocols&quot;</td>
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<td>• &quot;Direct and indirect MR arthrography&quot;</td>
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<td>• &quot;MR imaging of infection and inflammatory arthropathies&quot;</td>
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April 27, 2005
All-Star Webcast Lecture Series, sponsored by Franklin & Seidelman Teleradiology Associates
- “MRI of the diabetic foot”

May 6, 2005
Spine Symposium, sponsored by Temple University, Philadelphia, PA
- “MR of the spine”

May 7-13, 2005
13th Scientific Meeting of the International Society for Magnetic Resonance in Medicine, Miami, FL
- “Femoral acetabular impingement: 3-D analysis of hip morphology and association with pathology”
- “Artifacts and pitfalls using contrast agents” (CME course lecture)
- “MRI of the elbow” (CME course lecture)

May 15-20, 2005
American Roentgen Ray Society 105th Annual Meeting, New Orleans, LA
- “Simulated weight-bearing MRI of the knee: Initial experience using an MRI-compatible compression device”

May 26, 2005
Division of Rheumatology Grand Rounds, Department of Medicine, Thomas Jefferson University Hospital, Philadelphia, PA
- “Imaging of arthritis”

June 15, 2005
Sports Medicine Seminar, Doylestown, PA
- “MRI of the spine”

LEVON N. NAZARIAN, M.D.

September 17, 2004
Division of Rheumatology Grand Rounds, Department of Medicine, Thomas Jefferson University Hospital, Philadelphia, PA
- “Ultrasound of articular and periarticular abnormalities”

September 29, 2004
Department of Physical Medicine and Rehabilitation Grand Rounds, Thomas Jefferson University Hospital, Philadelphia, PA
- “Musculoskeletal ultrasound: Wave of the future”

October 22-24, 2004
7th Annual North American Musculoskeletal Imaging Symposium: A Multidisciplinary Approach to the Upper Extremity, Toronto, Canada
- “Anatomy and ultrasound of the normal shoulder”
- “Elbow examination: Live demonstration”
- “Interventional MSK ultrasound: A new treatment technique”

October 29-31, 2004
14th Annual Meeting and Postgraduate Course, Society of Radiologists in Ultrasound, Washington, DC
- “Interventional procedures in musculoskeletal ultrasound”

November 28-December 3, 2004
90th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- “Musculoskeletal ultrasound: Do we want to keep it or do we want to give it away? Viewpoint of the ultrasound zealot” (plenary session)

December 15, 2004
Northern Valley Rehab Society, Cresskill, NJ
- “Musculoskeletal ultrasound: Wave of the future”
February 12-13, 2005  Jefferson Upper Extremity Imaging Symposium, Philadelphia, PA
  • “Shoulder and elbow sonography”

March 12, 2005  Tendinopathy Seminar, West Conshohocken, PA
  • “Imaging of tendon problems...no better choice than ultrasound”

May 3, 2005  Department of Podiatry Grand Rounds, Presbyterian Hospital, Philadelphia, PA
  • “Ultrasound of the foot and ankle”

May 10-13, 2005

The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
  • “Musculoskeletal ultrasound” (course director and moderator)
  • “Introduction to musculoskeletal ultrasound”
  • “Ultrasound of the foot and ankle”
  • “Ultrasound of soft tissue masses”
  • “Color Doppler in musculoskeletal ultrasound”
  • “Musculoskeletal disease seen during vascular testing”

May 15-20, 2005  American Roentgen Ray Society 105th Annual Meeting, New Orleans, LA
  • “Musculoskeletal ultrasound scientific session” (moderator)
  • “Musculoskeletal ultrasound: Boom or bust for radiologists?” (instructional lecture)

June 4, 2005  Annual Assembly of the Pennsylvania Academy of Physical Medicine and Rehabilitation, Hershey, PA
  • “Musculoskeletal ultrasound workshop”

LAURENCE NEEDLEMAN, M.D.

September 30-October 2, 2004  2nd Vascular Ultrasound Annual Meeting, Adriatic Vascular Ultrasound Society, Grado, Italy
  • “Carotid and vertebral arteries”
  • “Ultrasound diagnosis of deep vein thrombosis”
  • “Peripheral arterial disease: Ultrasound evaluation”
  • “Case review and discussion”

October 29-31, 2004  14th Annual Meeting and Postgraduate Course, Society of Radiologists in Ultrasound, Washington, DC
  • “Waveform analysis”

November 19-20, 2004  Advances in Vascular Imaging and Diagnosis: 15th Symposium and Workshops on Management and Clinical Issues, sponsored by Montefiore Medical Center, New York, NY
  • “Doppler waveforms: A reflection of the hemodynamics of arterial and venous flow”
  • “4-D ultrasound of the carotid arteries: Current status and what is on the horizon”

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January 21-23, 2005
7th Annual Weekend Review Course: Vascular Ultrasound Imaging, North Carolina Radiological Society, Charlotte, NC
- "New horizons in vascular ultrasound"
- "Interesting cases"
- "Lower extremity venous ultrasound"
- "Upper extremity venous ultrasound"

April 15-17, 2005
30th Annual Spring Diagnostic Ultrasound Conference, Los Angeles Radiological Society, Los Angeles, CA
- "Venous ultrasound: Diagnoses other than acute DVT"
- "Test your Doppler knowledge"
- "Bypass graft Doppler"
- "Aneurysms, pseudoaneurysms, fistulas and other arterial lesions"

May 6-8, 2005
Annual Postgraduate Seminar in Diagnostic Ultrasound, Novi, MI
- "Sonographic evaluation of lower extremity venous disease"
- "Carotid ultrasound: Advances and controversies"
- "Hemodynamics and cardinal features of Doppler diagnosis: Why do arterial waveforms look the way they do?"

May 10-13, 2005
The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
- "Doppler waveforms"
- "Color artifacts: A quiz"
- "Bypass graft interpretation"
- "Case interpretation"
- "Venous practice and interpretation discussion"
- "Renal artery protocol: What is in it, what’s normal and abnormal, and why"
- "Arterial Duplex protocol: What is in it, what’s normal and abnormal, and why"
- "Interpretation of radial and upper extremity artery evaluation"
- "Interesting cases"
- "Carotid practice and interpretation discussion"

May 25, 2005
Pittsburgh Radiological Society, Pittsburgh, PA
- "Carotid interpretation"
- "What’s new in vascular ultrasound"

May 26, 2005
Visiting Professor, Department of Radiology, West Penn Hospital, Pittsburgh, PA
- "Vascular ultrasonography: A review"

PATRICK L. O’KANE, M.D.

June 13-16, 2005
Bi-Annual Summit Meeting, Trinational Chornobyl Project, Washington, DC
- "Performance comparison of Toshiba and Terason equipment in thyroid nodule detection"
LAURENCE PARKER, PH.D.

November 28-December 3, 2004
90th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
• “Recent changes in place-of-service where imaging is performed in the United States”
• “Growth in utilization rates of noninvasive diagnostic imaging (NDI) among radiologists and nonradiologist physicians between 1999 and 2002”

CATHERINE W. PICCOLI, M.D.

August 5-8, 2004
22nd Annual Pittsburgh Breast Imaging Seminar: Concurrent Sessions for Radiologists and Technologists, sponsored by Allegheny General Hospital, Pittsburgh, PA
• “Breast MRI: The academic perspective”
• “MRI guided breast biopsy”

April 10, 2005
MultiHance Expert Meeting, Las Vegas, NV
• “Higher relaxivity in MR mammography”

VIJAY M. RAO, M.D.

October 11, 2004
Reunion Class Clinic Program, Jefferson’s Journey 1975-2005, Jefferson Medical College, Alumni Weekend, Philadelphia, PA
• “New horizons in radiology”

November 28-December 3, 2004
90th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
• “Geographic variations throughout the United States in utilization of noninvasive diagnostic imaging (NDI)”
• “Payments to orthopedic surgeons for magnetic resonance imaging”
• “Do neurologists have a substantial market share in MRI and CT of the central nervous system?”

February 2, 2005
Department of Radiology Grand Rounds, Columbia University, New York, NY
• “Imaging of temporal bone”
• “Advanced imaging in head and neck carcinoma”

March 2, 2005
Visiting Professor, Department of Radiology, Mercy Catholic Medical Center, Fitzgerald Mercy Division, Darby, PA
• “Sinonasal imaging”

April 21, 2005
Annual Socio-Economic Workshop, Pennsylvania Radiological Society and Philadelphia Roentgen Ray Society, Philadelphia, PA
• “Impact of self referral”

April 26, 2005
Visiting Professor, Department of Radiology, Cooper Medical Center, Camden, NJ
• “Interesting head and neck cases”
May 27, 2005
Visiting Professor, Department of Radiology, Bryn Mawr Hospital, Bryn Mawr, PA
• “Interesting head and neck cases”

SHARON R. SEGAL, D.O.

May 10-13, 2005
The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
• “Vascular case conference”

KEVIN L. SULLIVAN, M.D.

March 31-April 5, 2005
30th Annual Meeting of the Society of Interventional Radiology, New Orleans, LA
• “Immunoembolization of hepatic metastatic uveal melanoma”

LISA TARTAGLINO, M.D.

October 7-9, 2004
Neuroradiology: The Essentials, sponsored by University of Pennsylvania Medical Center, Philadelphia, PA
• “CT angiography of the head and neck”
• “Cerebral hemorrhage”

February 3, 2005
Department of Radiology Grand Rounds, Hahnemann University Hospital, Philadelphia, PA
• “Applications of CT angiography in neuroradiology”

MATHEW L. THAKUR, PH.D.

September 24-27, 2004
International Congress of Radiopharmacy and Radiopharmaceutical Chemistry, Istanbul, Turkey
• “New trends in radiopharmaceutical chemistry and molecular imaging”

October 9-13, 2004
8th Asia Oceania Congress of Nuclear Medicine and Biology, Beijing, China
• “PET imaging of oncogene over expression”

October 22-24, 2004
Annual Meeting of the New England Chapter of the Society of Nuclear Society of Nuclear Medicine, Westchester, NY
• “Toward NeutroSpec”

October 31-November 7, 2004
44th Annual Meeting of the Japanese Society of Nuclear Medicine, Kyoto, Japan
• “Recent advances in molecular imaging”

November 8, 2004
Visiting Professor, Department of Radiology, Oakwood Hospital, Detroit, MI
• “Imaging infection: Future trends”
December 13, 2004  Pre-congress of 36th Annual Conference of the Society of Nuclear Medicine India, Bangalore, India
  • "PET imaging of oncogene expression"

December 15-18, 2004  36th Annual Conference of the Society of Nuclear Medicine India, Mysore, India
  • "Novel radiopharmaceuticals for molecular imaging"

January 15-19, 2005  31st Annual Meeting of the American College of Nuclear Physicians, San Diego, CA
  • "New tracers for imaging infection (including FDG)"

January 27-30, 2005  Society of Nuclear Medicine Midwinter Meeting, Tampa, FL
  • "Imaging infection: NeutroSpec"

February 3-5, 2005  Eastern Isotopes Annual Gathering, Vallarta, Mexico
  • "Recent development of positron radiopharmaceuticals"

February 18-20, 2005  32nd American College of Nuclear Medicine Annual Meeting and Scientific Session, Las Vegas, NV
  • "Imaging infection"

March 2-3, 2005  Department of Radiology Grand Rounds, University of Texas, San Antonio, TX
  • "Diagnosis of equivocal appendicitis"

March 31-April 1, 2005  Annual Meeting of the Central Chapter of the Society of Nuclear Medicine, Chicago, IL
  • "Recent advances in radiopharmaceuticals"

April 1-5, 2005  American Pharmacists Association’s Annual Meeting and Exposition, Orlando, FL
  • "Imaging infection using NeutroSpec"

April 26, 2005  Senate Caucus, Washington, DC
  • "Recent advances in nuclear medicine: Diagnosis and therapy"

April 30-May 2, 2005  Annual Meeting of the Greater New York Chapter of the Society of Nuclear Medicine, Tarrytown, NY
  • "Imaging infection: Now and the future"

June 18-22, 2005  52nd Annual Meeting of the Society of Nuclear Medicine, Toronto, Canada
  • "Cu-64 labeled PNA for imaging pancreatic cancer"
  • "NeutroSpec"

PAMELA VAN TASSEL, M.D.

September 29-October 3, 2004  38th Annual Meeting and Symposium of the American Society of Head and Neck Radiology, Philadelphia, PA
  • "Adenomatoid odontogenic tumor combined with calcifying epithelial odontogenic tumor: A case report"
  • "Use of PET in head and neck oncology"
ANNINA N. WILKES, M.D.

May 10-13, 2005

The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
- "Sonomammography tutorial"
- "Breast ultrasound – Normal and developmental anatomy and scanning techniques"
- "Mammographic – Sonographic correlation"
- "Interventional procedures"

SHAOXIONG ZHANG, M.D., PH.D.

October 15-16, 2004
5th Interventional MRI Symposium, Boston, MA
- "In vivo cardiovascular catheterization under real-time MRI guidance – A passive tracking approach"

November 28-December 3, 2004
90th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- "Cardiac and coronary catheterization under real-time MR guidance using a passive tracking method"
- "MR characteristics of familial isolated noncompaction of the ventricular myocardium"

ADAM C. ZOGA, M.D.

March 13-16, 2005
Society of Skeletal Radiology Annual Meeting, Orlando, FL
- "Patterns of disease progression in SONK (spontaneous osteonecrosis of the knee) by MRI"
- "Unknown case of the day Monday presentation"

May 15-20, 2005
American Roentgen Ray Society 105th Annual Meeting, New Orleans, LA
- "Lateral calcaneocuboid ligament ruptures imitating talocrural ligament injuries diagnosed with a passive motion device using MR imaging"
- "Osteochondral defects of the talar dome: Morphology and frequency by location on MRI"
- "Plantar fasciitis associations: Concurrent foot and ankle findings by MRI"
- "Simulated weight bearing MRI of the knee: Initial experience using an MRI compatible compression device"
- "Acromion morphology and its relation to rotator cuff impingement with surgical correlation"
HONORS, EDITORIAL ACTIVITIES, SERVICE TO REGIONAL OR NATIONAL ORGANIZATIONS

OKSANA H. BALTAROWICH, M.D.

- Dean's Citation, Advancement of Education, Jefferson Medical College
- Vice-President, Ukrainian Medical Association of North America, Pennsylvania Chapter
- Member, Thyroid Advisory Group for U.S., Belarus and Ukraine Cooperative Studies of Post-Chernobyl Thyroid Disease, National Cancer Institute, National Institutes of Health
- Member, Bi-National Advisory Group for U.S., Belarus and Ukraine Cooperative Studies of Post-Chernobyl Thyroid Disease, National Cancer Institute, National Institutes of Health
- Member, Executive Committee, Friends of Radiology in Ukraine
- Member, Advisory Editorial Board, Ukrainian Radiological Journal

DIANE BERGIN, M.D.

- Reviewer, American Journal of Roentgenology

JOSEPH BONN, M.D.

- Chair, Society of Interventional Radiology Foundation, Society of Interventional Radiology
- Member, Executive Committee, Society of Interventional Radiology
- Director, University of Virginia Medical Alumni Association
- Reviewer, Radiology
- Reviewer, Cardiovascular and Interventional Radiology
- Reviewer, Journal of Vascular and Interventional Radiology

HAROON H. DURRANI, M.D.

- Reviewer, Sonoworld.com

DAVID J. ESCHelman, M.D.

- Member, Relative Value Update Advisory Committee, Society of Cardiovascular and Interventional Radiology
- Member, Advisory Board, Journal of Vascular and Interventional Radiology
- Member, Editorial Board, Journal of Vascular and Interventional Radiology

RICK I. FELD, M.D.

- Chair, Membership Committee, American Institute of Ultrasound in Medicine
- Chair, Exam Development Task Force (Abdomen), American Registry of Diagnostic Medical Sonographers
• Secretary, Philadelphia Roentgen Ray Society
• Member, Executive Board, Pennsylvania Radiological Society
• Member, Executive Board, Philadelphia Roentgen Ray Society
• Member, Program Committee, Philadelphia Roentgen Ray Society
• Member, Ultrasound Section on Human Resources, American College of Radiology
• Alternate Councilor, Pennsylvania, American College of Radiology
• Member, Advisory Editorial Board, Journal of Ultrasound in Medicine
• Reviewer, Journal of the American Medical Association
• Reviewer, American Journal of Roentgenology
• Reviewer, Clinical Imaging
• Reviewer, Journal of Clinical Ultrasound
• Reviewer, Journal of Ultrasound in Medicine
• Reviewer, Journal of Vascular and Interventional Radiology

ADAM E. FLANDERS, M.D.

• Consultant, Medical Policy, Independence Blue Cross
• Consultant, Medical Review, Independence Blue Cross
• Consultant, Contrast Division, Squibb Diagnostics
• Guest Speaker, Contrast Speakers' Bureau, Squibb Diagnostics
• Member, Electronic Communications Committee, Radiological Society of North America
• Member, Scientific Exhibits Award Committee, Radiological Society of North America
• Member, Informatics Committee, American Society of Spine Radiology
• Member, Audiovisual Committee, American Society of Neuroradiology
• Abstract Reviewer, InfoRad, 90th Scientific Assembly and Annual Meeting of the Radiological Society of North America
• Imaging Editor, Yearbook in Ophthalmology
• Reviewer, The New England Journal of Medicine
• Reviewer, American Journal of Neuroradiology
• Reviewer, Neuroradiology
• Reviewer, Radiographics
• Reviewer, The Radiological Society of North America Electronic Journal

FLEMMING FORSBERG, PH.D.

• Certificate of Recognition, School of Biomedical Engineering, Sciences and Health Systems, Drexel University, 2005
• Member, Education and Research Fund Committee, American Institute of Ultrasound in Medicine
• Member, Advisory Editorial Board, Journal of Ultrasound in Medicine
• Member, Advisory Editorial Board, Ultrasound in Medicine and Biology
• Reviewer, Radiology
• Reviewer, IEEE Transactions on Ultrasonics, Ferroelectronics & Frequency Control
• Reviewer, Circulation
• Reviewer, Journal of Ultrasound in Medicine
• Reviewer, Ultrasound in Medicine and Biology
• Reviewer, Ultrasonics
• Reviewer, Acoustic Research Letters Online
• Editor's Recognition Award with Distinction, Radiology
DAVID P. FRIEDMAN, M.D.

- Member, Education Committee, American Society of Neuroradiology
- Member, Editorial Board, Current Problems in Diagnostic Radiology
- Reviewer, American Journal of Roentgenology
- Reviewer, Journal of Computer Assisted Tomography

ERIC GINGOLD, PH.D.

- Member, Task Group on DR Exposure Index, American Association of Physicists in Medicine
- Reviewer, Final Report of Task Group on Computed Radiography, American Association of Physicists in Medicine
- Reviewer, Radiology
- Reviewer, Medical Physics

BARRY B. GOLDBERG, M.D.

- Antoine Beclere Medal Award, International Society of Radiology, 2004
- Dean's Citation, Faculty Mentoring, Jefferson Medical College
- Honorary Medical Degree, Iuliu Hatieganu University School of Medicine, Romania
- Certificate of Recognition, School of Biomedical Engineering, Sciences and Health Systems, Drexel University, 2005
- President, Radiology Outreach Foundation
- Chair, Archives Committee, American Institute of Ultrasound in Medicine
- Chair, Archives Committee, World Federation for Ultrasound in Medicine and Biology
- Chair, Committee on Ultrasound, American College of Radiology Imaging Network
- Chair, Committee on International Relations and Education, Radiological Society of North America
- Chair, Fiftieth Anniversary Committee, American Institute of Ultrasound in Medicine
- Member, Administrative Council, World Federation for Ultrasound in Medicine and Biology
- Member, Global Steering Group for Education and Training in Diagnostic Imaging, World Health Organization
- Member, Presidential Advisory Council, American Institute of Ultrasound in Medicine
- Member, Board of Directors, Breast Cancer and Women's Health Ultrasound Foundation
- Member, International Organizing Committee, International Congress of the Ultrasonic Examination of the Breast
- Member, Education Council, Radiological Society of North America
- Member, Corporate Advisory Council, Radiological Society of North America
- Member, Public Information Advisory Board, Radiological Society of North America
- Member, Committee on International Service, American College of Radiology
- Member, International Liaison Committee, Ultrasound in Medicine and Biology
- Member, Contrast Agents Panel, American Institute of Ultrasound in Medicine
- Member, Research and Education Foundation Program Committee, Radiological Society of North America
- Member, Education and Research Fund Committee, American Institute ofUltrasound in Medicine
- Member, Endowment for Education and Research Committee, American Institute of Ultrasound in Medicine
- Member, Awards Committee, American Institute of Ultrasound in Medicine
• Member, Outstanding Researcher Award Review Panel, Radiological Society of North America Research and Education Foundation
• Member, Corporate Affairs Committee, Society of Radiologists in Ultrasound
• Member, Past Presidents Committee, American Institute of Ultrasound in Medicine
• Medical Advisor, Ultrasound, World Health Organization,
• Medical Advisor, Ultrasonic Procedures, Blue Shield of Pennsylvania
• Consultant, Medicare, Pennsylvania Blue Shield
• Consultant, Diagnostic Ultrasound, Nuclear Medicine Service, Veterans Administration
• Consultant, Ultrasound, Philadelphia Zoo
• Consultant, United States, Israel Binational Science Foundation
• Representative, Management of Adnexal Masses Technical Expert Panel, American College of Radiology
• Resource Advisor, March of Dimes Birth Defects Foundation
• Associate Editor, Surgical Endoscopy, Ultrasound, and Interventional Techniques
• Associate Editor, Journal of Ultrasound in Medicine
• Member, Editorial Advisory Board, West African Journal of Ultrasound
• Member, Editorial Advisory Board, Ultrasound in Medicine and Biology
• Member, Advisory Committee, Ultrasonidos en Medicina
• Member, International Advisory Board, Turkish Journal of Diagnostic and Interventional Radiology
• Member, International Advisory Board, Indian Journal of Medical Ultrasound
• Editorial Advisor, Journal d'Echographie et de Medecine Ultrasonore
• Overseas Editorial Advisor, Borno Medical Journal
• Member, Editorial Board, Journal of Ultrasound in Medicine and Biology
• Member, Editorial Board, Journal of Ultrasound in Medicine
• Member, Editorial Board, Journal of Clinical Ultrasound in Medicine
• Member, Editorial Board, Clinics in Diagnostic Ultrasound
• Member, Editorial Board, Archives of Clinical Imaging
• Member, Editorial Board, Journal of Surgical Ultrasonology
• Member, Editorial Board, Ultrasound International
• Member, Editorial Board, Advances in Echo Enhancement
• Member, Editorial Board, Radiologia
• Member, Editorial Board, Journal d'Échographie et de Medicine Ultrasonore
• Member, Editorial Board, Acta Clinica Croatica
• Member, Editorial Board, Journal Ultrasonido
• Member, International Editorial Board, Giornale Italiano di Ecografia Journal
• Editorial Consultant, Applied Radiology
• Editorial Consultant, Chest
• Editorial Consultant, Pediatrics
• Editorial Consultant, Medcom Faculty of Medicine
• Coordinator of Ultrasonography, JAMA Topics in Radiology
• Reviewer, The New England Journal of Medicine
• Reviewer, Cancer
• Reviewer, Radiology
• Reviewer, Journal of the National Cancer Institute
• Reviewer, Gastroenterology
• Reviewer, Gastrointestinal Endoscopy
• Reviewer, American Journal of Roentgenology
• Reviewer, Health Devices
CARIN F. GONSALVES, M.D.
• Reviewer, Journal of Vascular and Interventional Radiology

ETHAN J. HALPERN, M.D., M.S.C.E.
• Member, Public Information Advisors Network, Radiological Society of North America
• Member, Ultrasound Committee, American College of Radiology Imaging Network
• Associate Editor, Radiology (2004)
• Editorial Consultant, Radiology (2005)
• Reviewer, Annals of Internal Medicine
• Reviewer, American Journal of Roentgenology
• Reviewer, Ultrasound in Medicine and Biology

CHARLES M. INTENZO, M.D.
• Physician of the Year Award, National Republican Congressional Committee, 2004
• Associate Editor, Radiology
• Reviewer, American Journal of Roentgenology
• Reviewer, Radiographics

DAVID KARASICK, M.D.
• Editor-in-Chief, Seminars in Musculoskeletal Radiology
• Reviewer, American Journal of Roentgenology
• Reviewer, Radiology
• Reviewer, Skeletal Radiology

STEPHEN KARASICK, M.D.
• Examiner, Genitourinary Section, American Board of Radiology
• Examiner, Gastrointestinal Section, American Board of Radiology
• Reviewer, Radiology
• Reviewer, American Journal of Roentgenology

SUNG M. KIM, M.D.
• Member, Executive Council, Program Development Education Funding, Society of Nuclear Medicine
• Member, Brain Imaging Council, Society of Nuclear Medicine
• Member, Computer and Instrumentation Council, Society of Nuclear Medicine
• Member, Correlative Imaging Council, Society of Nuclear Medicine
• Member, Membership Committee, Society of Nuclear Medicine
• Reviewer, Journal of Nuclear Medicine
ALFRED B. KURTZ, M.D.

- Member, Finance Committee, American Institute of Ultrasound in Medicine
- Member, Research and Education Fund Committee, American Institute for Ultrasound in Medicine
- Examiner, Ultrasound Section, American Board of Radiology
- Member, Editorial Board, *Journal of Ultrasound in Medicine*
- Member, Manuscript Review Panel, *American Journal of Roentgenology*
- Editorial Consultant, *Radiology*
- Reviewer, *Radiology*
- Reviewer, *Radiographics*

SONG LAI, PH.D.

- Grant Reviewer, Brain Disorders nd Clinical Neuroscience Study Section, National Institutes of Health
- Grant Reviewer, National Sciences and Engineering Research Council of Canada
- Reviewer, *Journal of Magnetic Resonance Imaging*
- Reviewer, *Magnetic Resonance Imaging*
- Reviewer, *Magnetic Resonance in Medicine*
- Reviewer, *NMR in Biomedicine*
- Reviewer, *NeuroImage*
- Reviewer, *Human Brain Mapping*
- Reviewer, *Magnetic Resonance Materials in Biology, Physics and Medicine (MAGMA)*
- Reviewer, *Stroke*
- Reviewer, *Medical Physics*

ANNA S. LEV-TOAFF, M.D.

- Member, Education and Research Committee, American Institute of Ultrasound in Medicine
- Editorial Board, *Journal of Ultrasound in Medicine*
- Reviewer, *Radiology*
- Reviewer, *American Journal of Roentgenology*
- Reviewer, *Journal of Ultrasound in Medicine*
- Reviewer, *Ultrasound in Obstetrics and Gynecology*

JI-BIN LIU, M.D.

- Member, Medical Advisory Board, International Certification and Education Accreditation Foundation
- Grant Reviewer, National Natural Science Foundation of China
- Editorial Board, *Chinese Journal of Medical Imaging Technology*
- Editorial Board, *Journal of Ultrasound in Clinical Medicine*
- Reviewer, *Journal of Ultrasound in Medicine*
- Reviewer, *Ultrasound in Medicine and Biology*
- Reviewer, *Journal of Clinical Ultrasound*
- Reviewer, *Chinese Journal of Ultrasonography*
LYNN LUCAS-FEHM, M.D.

- Member, Board of Directors, KePRO, subsidiary of Pennsylvania Medical Society

CHRISTOPHER R.B. MERRITT, M.D.

- President, American Roentgen Ray Society
- Trustee, American Board of Radiology
- Chair, Board of Directors, The Roentgen Fund, American Roentgen Ray Society
- Member, Maintenance of Certification Coordinating Committee, American Board of Radiology
- Member, Strategic Planning Committee, College of Physicians
- Contributing Editor, Breast Diseases Quarterly
- Advisory Editor, Ultrasound in Medicine and Biology
- Advisory Editor, Ultrasound Quarterly
- Reviewer, Radiology
- Reviewer, Academic Radiology
- Reviewer, American Journal of Roentgenology

DONALD G. MITCHELL, M.D.

- Dean's Citation, Faculty Mentoring, Jefferson Medical College, 2005
- Chair, Gynecology Disease Site Committee, American College of Radiology Imaging Network
- Director, Body MRI Educational Product, MR Training Initiative, American College of Radiology
- Member, Committee on Abdominal Imaging, Commission on Body Imaging, American College of Radiology
- Member, Lifelong Learning Steering Committee, American College of Radiology
- Member, Awards Committee, International Society for Magnetic Resonance in Medicine
- Member, Membership Committee, Society of Computed Body Tomography and Magnetic Resonance
- Associate Editor, Journal of Magnetic Resonance Imaging
- Member, Editorial Board, Abdominal Imaging
- Reviewer, American Journal of Roentgenology
- Reviewer, Academic Radiology
- Reviewer, Radiographics
- Editor's Recognition Award with Distinction, Radiology

WILLIAM B. MORRISON, M.D.

- Dean's Citation, Excellence in Teaching, Jefferson Medical College, 2005
- Member, Expert Panel on Musculoskeletal Radiology, American College of Radiology Appropriateness Criteria, American College of Radiology
- Member, Expert Panel on Musculoskeletal Radiology, Continuous Professional Improvement Series, American College of Radiology
- Member, Program Committee, American Roentgen Ray Society
- Member, Program Subcommittee, Society of Skeletal Radiology
- Member, Electronic Communications Committee, Society of Skeletal Radiology
- Member, Scientific Poster Committee, 90th Assembly and Annual Meeting of the Radiological Society of North America
• Member, Editorial Board, *Seminars in Musculoskeletal Radiology*
• Reviewer, *Radiology*
• Reviewer, *American Journal of Roentgenology*
• Reviewer, *Skeletal Radiology*
• Editor's Recognition Award with Distinction, *Radiology*

LEVON N. NAZARIAN, M.D.

• Chair, Committee on Research and Technology Assessment, Commission on Ultrasound, American College of Radiology
• Honorary Doctor of Medicine, Yerevan State Medical University, Republic of Armenia
• Member, Special Study Section, *Small Business Novel Technologies for In Vivo Imaging and Image-guided Cancer Interventions*, National Cancer Institute, National Institutes of Health
• Member, Ultrasound Item Writing Committee, American Board of Radiology
• Member, Council on Sections, American Institute of Ultrasound in Medicine
• Member, Annual Convention Committee, American Institute of Ultrasound in Medicine
• Member, Regional Course Committee, American Institute of Ultrasound in Medicine
• Member, Public Information Advisors Network, Radiological Society of North America
• Member, Publication Committee and Editorial Policy Subcommittee, American Roentgen Ray Society
• Medical Adviser, Public Web Site, Radiological Society of North America – American College of Radiology
• Associate Editor, *Radiology*

LAURENCE NEEDLEMAN, M.D.

• Chair, Committee on Bylaws, Philadelphia Roentgen Ray Society
• Chair, Regional Course Committee, American Institute of Ultrasound in Medicine
• Vice-Chair, Program Committee, Society of Radiologists in Ultrasound
• Member, Board of Directors, Intersocietal Commission on Accreditation of Vascular Laboratories
• Member, Clinical Standards Committee, American Institute of Ultrasound in Medicine
• Member, Practice Guideline Collaborative Subcommittee for the Performance of an Ultrasound Examination of the Abdomen or Retroperitoneum, American College of Radiology and American Institute of Ultrasound in Medicine
• Member, Practice Guideline Collaborative Subcommittee for the Performance of Peripheral Venous Ultrasound Examination, American College of Radiology and American Institute of Ultrasound in Medicine
• Member, Practice Guideline Collaborative Subcommittee for the Performance of Ultrasound Vascular Mapping for Preoperative Planning of Dialysis Access, American College of Radiology and American Institute of Ultrasound in Medicine
• Member, Committee on Ultrasonography, Pennsylvania Radiological Society
• Reviewer, Ultrasound Accreditation, American College of Radiology
• Reviewer, *Journal of Ultrasound in Medicine*
• Occasional Reviewer, *Cancer*
• Occasional Reviewer, *Journal of Clinical Ultrasound*
PATRICK L. O’KANE, M.D.

- Consultant, NIH Trinational Chernobyl Project

CATHERINE W. PICCOLI, M.D.

- Member, Committee on Standards and Accreditation, Commission on Ultrasound, American College of Radiology
- Member, Clinical Image Reviewer Subcommittee, Mammography Accreditation Program, American College of Radiology
- Member, Committee on Mammography, The Pennsylvania Radiological Society
- Member, Institutional Review Board, American College of Radiology
- Reviewer, Radiology
- Reviewer, American Journal of Roentgenology
- Reviewer, Ultrasound in Medicine and Biology

VIJAY M. RAO, M.D.

- President, American Society of Head and Neck Radiology
- Member, Board of Directors, Association of Program Directors in Radiology
- Member, Executive Committee, American Society of Head and Neck Radiology
- Chair, Research and Education Program Committee, Radiological Society of North America
- Member, Awards Committee, Association of Program Directors in Radiology
- Member, Clinical Practice Committee, American Society of Neuroradiology
- Member, Committee on Government Issues, Association of Program Directors in Radiology
- Member, Executive Committee, American Society of Neuroradiology
- Member, Scientific Program Committee, Radiological Society of North America
- Reviewer, Scientific Abstracts, 90th Scientific Assembly and Annual Meeting of the Radiological Society of North America
- Reviewer, Scientific Exhibits, 90th Scientific Assembly and Annual Meeting of the Radiological Society of North America
- Reviewer, Scientific Abstracts, 53rd Annual Meeting of the Association of University Radiologists
- Reviewer, Scientific Abstracts, 38th Annual Meeting of the American Society of Head and Neck Radiology
- Reviewer, Scientific Abstracts, 43rd Annual Meeting of the American Society of Neuroradiology
- Member, Editorial Board, Journal of the American College of Radiology
- Reviewer, Radiology
- Reviewer, American Journal of Neuroradiology
- Reviewer, Neuroradiology
- Reviewer, Journal of the American College of Radiology
- Reviewer, Academic Radiology
- Reviewer, Radiographics
- Editor’s Certificate of Recognition for Review of Manuscripts, Radiographics
- Editors Certificate of Recognition for Review of Scientific Exhibits, Radiographics
- Named as one of the “Best Doctors in America 2004-2005”, Philadelphia Magazine
SHARON SEGAL, D.O.

- Member, Continuing Medical Education Committee, American Osteopathic College of Radiology

KEVIN L. SULLIVAN, M.D.

- Grant Reviewer, Society of Interventional Radiology Foundation, Society of Interventional Radiology
- Reviewer, *Journal of Vascular and Interventional Radiology*

LISA M. TARTAGLINO, M.D.

- Reviewer, *Radiology*
- A. Edward O'Hara, M.D. Award for Excellence in Teaching, Department of Radiology, Thomas Jefferson University, 2005

MATHEW L. THAKUR, PH.D.

- President, Society of Nuclear Medicine
- Delegate-at-Large, Society of Nuclear Medicine
- President, Molecular Imaging Center of Excellence, Society of Nuclear Medicine
- Chair, Molecular Imaging Task Force, Society of Nuclear Medicine
- Chair, International Task Force, Society of Nuclear Medicine
- Chair, Award Committee, Society of Nuclear Medicine
- Chair, Young Investigators Award Committee, International Society of Radiolabeled Blood Elements
- Lead Member, National Radionuclide Availability Task Force, Society of Nuclear Medicine
- Member, Board of Governors, Greater New York Chapter, Society of Nuclear Medicine
- Member, Board of Directors, Society of Nuclear Medicine
- Member, Board of Directors, Eagle Alliance
- Member, Financial Committee, Society of Nuclear Medicine
- Member, Advisory Committee, US Pharmacopea
- Member, Advisory Committee, Kuwait Medical Research Council
- Member, Advisory Committee, International Atomic Energy Agency
- Member, Education Research Committee, Society of Nuclear Medicine
- Member, International Science Committee, International Society of Radiolabeled Blood Elements
- Member, Physicians Self-Referral Task Force, Society of Nuclear Medicine
- Member, Public Relations Committee, Society of Nuclear Medicine
- Member, Scientific Program Committee, World Federation of Nuclear Medicine and Biology
- *Ad hoc* Grant Reviewer, National Institutes of Health
- Grant Reviewer, Foundation for Medical Research, Vienna, Austria
- 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, *European Journal of Nuclear Medicine*
• Member, Editorial Board, *Journal of the Indian Association of Clinical Medicine*
• Member, Editorial Board, *Nuclear Medicine Communications*
• Member, Editorial Board, *Journal of the Association of Latin American Societies of Nuclear Medicine and Biology*
• Member, Editorial Board, *Spanish Journal of Nuclear Medicine*
• Reviewer, *European Journal of Nuclear Medicine*
• Reviewer, *Journal of Labelled Compounds and Radiopharmaceuticals*
• Reviewer, *Journal of Nuclear Medicine*
• Reviewer, *Journal of Nuclear Medicine and Biology*
• Reviewer, *Nuclear Medicine Communications*
• Reviewer, *Bioorganic and Medicinal Chemistry*
• Reviewer, *Oncology*

**TERRI TUCKMAN, M.D.**

• Director of Students, Board of Directors, American Medical Women's Association
• Member, Professional Development Committee, American Medical Women’s Association
• Member, Committee on Gender Equity, American Medical Women’s Association

**ANNINA N. WILKES, M.D.**

• State Director, American Medical Women’s Association
• Member, Women’s Health Committee, American Medical Women’s Association
• Member, Medical Advisory Board, Linda Creed Breast Cancer Foundation
• International Visiting Professor, Radiologic Society of North America

**ADAM C. ZOGA, M.D.**

• Reviewer, *American Journal of Radiology*
APPENDIX

Table 1  ACTIVE GRANTS
Table 2  PENDING GRANTS
<table>
<thead>
<tr>
<th>PRINCIPAL INVESTIGATOR</th>
<th>TITLE OF PROJECT</th>
<th>FUNDING SOURCE</th>
<th>FUNDING DATES</th>
<th>DIRECT COSTS</th>
<th>INDIRECT COSTS</th>
<th>TOTAL COSTS FUNDED</th>
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<tbody>
<tr>
<td>Forsberg, F. C10101</td>
<td>Nanotechnology Delivery Team: Targeted Delivery of Biomolecules</td>
<td>Ben Franklin Technology Center of Southeastern Pennsylvania</td>
<td>08/01/02 - 12/31/04</td>
<td>$86,751</td>
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<td></td>
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<td>(current fiscal yr)</td>
<td>$17,840</td>
<td>$8,652</td>
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<td>Forsberg, F. R70101</td>
<td>Contrast-Enhanced US Detection of Angiogenesis</td>
<td>NIH (NCI) R21 CA93907</td>
<td>08/15/03 - 07/31/05</td>
<td>$250,000</td>
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<td></td>
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<td>(current fiscal yr)</td>
<td>$100,920</td>
<td>$57,525</td>
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<td>Forsberg, F. X07401</td>
<td>Estimation of Tumor Angiogenesis with Contrast Enhanced Subharmonic Ultrasound Imaging</td>
<td>U.S. Army Medical Research Acq. DAMD17-00-1-0464</td>
<td>07/01/00 - 07/31/05 no cost extension</td>
<td>$204,342</td>
<td>$89,967</td>
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<td>(current fiscal yr)</td>
<td>$19,070</td>
<td>$5,269</td>
<td>$24,339</td>
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<td>Forsberg, F. X08901</td>
<td>Ultrasound Activated Contrast Imaging for Prostate Cancer Detection</td>
<td>U.S. Army Medical Research Acq. DAMD17-03-1-0119</td>
<td>03/01/03 - 03/31/06</td>
<td>$371,930</td>
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<td>(current fiscal yr)</td>
<td>$64,666</td>
<td>$41,564</td>
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<td>Forsberg, F. Z22401</td>
<td>System for Excitation-Enhanced Ultrasound Contrast Imaging</td>
<td>NIH (SBIR) thru Spectranomic Imaging R44 HL62830</td>
<td>05/09/01 - 01/31/04</td>
<td>$155,819</td>
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<td>(current fiscal yr)</td>
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<td>Forsberg, F. Z22801</td>
<td>2 and 3D Imaging of Contrast Agents in Animal Models</td>
<td>NIH thru Medical Diagnostic Research Foundation R01 CA72895</td>
<td>08/01/01 - 06/30/05</td>
<td>$117,788</td>
<td>$67,140</td>
<td>$184,928</td>
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<td>(current fiscal yr)</td>
<td>$30,426</td>
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<td>Forsberg, F. Z35101</td>
<td>Ultrasound Enhancement of Viral-Mediated Gene Transfer Following Systemic Administration</td>
<td>W.W. Smith Charitable Foundation thru Temple University</td>
<td>08/01/04 - 06/30/05</td>
<td>$5,685</td>
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<td>$5,685</td>
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<td>Funding Agency</td>
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<td>End Date</td>
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<td>NIH (current fiscal yr)</td>
<td>U.S. Army Medical Research Acq. (current fiscal yr)</td>
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<td>US Detection of Sentinel Lymph Nodes in Melanoma</td>
<td>NIH (NCI) R01 CA100370</td>
<td>08/01/04 - 07/31/07</td>
<td>$611,254</td>
<td>$348,415</td>
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<td>$168,814</td>
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<td>American College of Radiology Cooperative Group</td>
<td>NIH thru ACRIN (cooperative group)</td>
<td>01/01/02 - 12/31/05</td>
<td>$16,000</td>
<td>$4,000</td>
<td>$14,972</td>
<td>$8,539</td>
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<td>Development of a New Class of Ultrasound Contrast Agents</td>
<td>NIH thru Drexel R01 H52901</td>
<td>06/01/01 - 05/31/05</td>
<td>$56,673</td>
<td>$32,304</td>
<td>$14,972</td>
<td>$8,539</td>
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<td>Intermittent Ultrasound Imaging of Prostate Cancer</td>
<td>U.S. Army Medical Research Acq.</td>
<td>08/01/01 - 08/31/04</td>
<td>$369,720</td>
<td>$218,134</td>
<td>$42,346</td>
<td>$24,137</td>
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<td>Positron Emission Tomography Pre- and Post-treatment Assessment for Locally Advanced Non-small Cell Lung Carcinoma</td>
<td>NIH thru ACRIN (cooperative group)</td>
<td>01/01/05 - 12/31/05</td>
<td>$16,000</td>
<td>$4,000</td>
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<td>Jefferson Magnetic Resonance Imaging Physics Program</td>
<td>Commonwealth of Pennsylvania Department of Health</td>
<td>03/17/04 - 01/13/06</td>
<td>$416,667</td>
<td>$237,500</td>
<td>$285,068</td>
<td>$162,489</td>
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<tr>
<td>Functional and Anatomical Connectivity MRI Study of Brain Tumor Infiltration: Application to Neurosurgery</td>
<td>Commonwealth of Pennsylvania Department of Health</td>
<td>01/01/05 - 12/31/08</td>
<td>$125,000</td>
<td>$0</td>
<td>$19,449</td>
<td>$19,449</td>
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<td>Contrast US Guided RF Ablation for Prostate Cancer</td>
<td>NIH (NIH) R21 EB002794</td>
<td>09/20/03 - 08/31/05</td>
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<td>$146,008</td>
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<td>$45,706</td>
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<td>In Vivo Evaluation of Elastography</td>
<td>NIH thru U of TX P01 CA64597</td>
<td>08/01/99 - 05/31/05</td>
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<td>$224,790</td>
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<td>Mitchell, D.</td>
<td>Hepatitis C: Grading and Staging by MR</td>
<td>NIH (NIDDK)</td>
<td>03/01/03 - 11/30/05</td>
<td>$200,000</td>
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<td>Mitchell, D.</td>
<td>Role of Radiology in the Pretreatment Evaluation of Invasive Cervical Cancer</td>
<td>NIH thru ACRIN</td>
<td>01/01/00 - 12/31/05</td>
<td>$20,657</td>
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<td>Mitchell, D.</td>
<td>American College of Radiology Cooperative Group</td>
<td>NIH thru ACRIN</td>
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<td>$16,000</td>
<td>$4,000</td>
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<td>Mechanism of the ACR Imaging Network</td>
<td>(cooperative group)</td>
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<td>Needlemann, L.</td>
<td>3D Ultrasound Vascular Blood Flow Imaging</td>
<td>NIH thru VueSonix</td>
<td>08/01/03 - 07/31/04</td>
<td>$115,197</td>
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<td>Piccoli, C.</td>
<td>Digital versus Screen-Film Mammography</td>
<td>NIH thru ACRIN</td>
<td>07/01/01 - 12/31/05</td>
<td>$253,102</td>
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<td>Piccoli, C.</td>
<td>Quantification of the Benefits of Pendant Mammography</td>
<td>U.S. Army Medical</td>
<td>09/20/01 - 09/19/05</td>
<td>$53,723</td>
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<tr>
<td>Piccoli, C.</td>
<td>MRI Evaluation of the Contralateral Breast in Women with a Recent Diagnosis of Breast Cancer</td>
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## Active Grants
07/01/04 - 06/30/05
(Report reflects entire award period and current fiscal year of award)

### FOUNDATION/NON-PROFIT ORGANIZATION GRANTS

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<tr>
<th>Principal Investigator</th>
<th>Title of Project</th>
<th>Funding Source</th>
<th>Funding Dates</th>
<th>Direct Costs</th>
<th>Indirect Costs</th>
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**TOTAL NON-PROFIT FUNDING**
*(current fiscal yr)*

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**TOTAL FUNDING**
*(current fiscal yr)*

<p>| $625,588 | $9,620 | $635,208 |</p>
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<td>Ultrasound Contrast Imaging of Lymph Nodes with Metastatic Melanoma</td>
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<td>A Phase II/III Multicenter, Randomized Study for the Characterization of Focal Liver Lesions Using SonoVue-Enhanced Ultrasonography</td>
<td>Bracco Diagnostics</td>
<td>06/24/02 - 09/30/04</td>
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<td>A Phase 3, Open-Label, Multicentre Study to Determine Efficacy and Safety of VISIPAQ (Iodixanol) Injection for Use in Intravenous Contrast-Enhanced CT Angiography of Abdominal Visceral Vessels</td>
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<td>O'Kane, P. A66301</td>
<td>Accuracy of Contrast-Enhanced Sonography for Detection of Traumatic Injuries to Solid Abdominal Organs Compared with Conventional (Non-Contrast) Sonography and Computed Tomography</td>
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- 11/15/04 - 11/30/05

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- 11/15/04 - 11/30/05

**Industrial Funding:**
- 05/01/92 - 04/30/02
- 11/15/04 - 11/30/05
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<td>Nanotechnology for Cancer Imaging and Diagnosis</td>
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<td>Development of a New Class of Contrast Agents</td>
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<td>Gonsalves, C.</td>
<td>Cardiac Outcomes of Renal Atherosclerotic Lesions (Coral)</td>
<td>NIH thru Medical University of Ohio</td>
<td>07/05/05 - 03/31/10</td>
<td>$37,336</td>
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<td>GLEEVEC for Primary and Recurrent Operable Malignant GIST</td>
<td>NIH thru ACRIN (cooperative group)</td>
<td>01/01/05 - 12/31/05</td>
<td>$20,842</td>
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<td>Skeletal Growth Mechanism in Clubfoot Treatment</td>
<td>NIH thru Drexel University</td>
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<td>Ultrasonic Classification of Breast Masses</td>
<td>NIH thru Drexel University</td>
<td>12/01/05 - 11/30/08</td>
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<td>Tissue Characterization Based on the Power-Law Shot Noise Model for the Ultrasound Echo</td>
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<td>Feld, R.</td>
<td>Real-Time Elastography for Evaluation of Thyroid Nodules</td>
<td>Hitachi Medical Systems</td>
<td>10/01/05 - 09/30/06</td>
<td>$40,375</td>
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<td>Halpern, E.</td>
<td>Correlation of Contrast-Enhanced Sonography to ProstaScint Scan Imaging of the Prostate</td>
<td>Cytogen Corp</td>
<td>10/01/05 - 09/30/06</td>
<td>$83,902</td>
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<td>Pilot Study of Microflow Imaging Technology to Improve Contrast-Enhanced Imaging of Prostate Cancer</td>
<td>Bristol-Myers Squibb</td>
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<td>Treatment of Chronic Elbow Tendonosis with Platelet Rich Plasma</td>
<td>Biomet Inc.</td>
<td>09/01/05 - 08/31/06</td>
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<td>Sullivan, K.</td>
<td>STRIDE I: Does Early Safe Thrombus Removal in DVT Have an Effect on Patient Outcomes</td>
<td>Bacchus Vascular</td>
<td>09/01/05 - 08/31/06</td>
<td>$10,460</td>
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**TOTAL INDUSTRIAL FUNDING**  
$139,137  
$34,160  
$173,297  

**TOTAL FIRST YEAR INDUSTRIAL FUNDING**  
$139,137  
$34,160  
$173,297  

**TOTAL PENDING FUNDING**  
$2,343,477  
$1,261,476  
$3,604,953  

**TOTAL FIRST YEAR PENDING FUNDING**  
$1,059,491  
$554,582  
$1,614,073  

(-01 year)