

2001

## Department of Radiology-Annual Executive Summary Report-July 1, 2000 to June 30, 2001

David C. Levin , M.D.

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Thomas  
Jefferson  
University

# DEPARTMENT OF RADIOLOGY

## ANNUAL REPORT

JULY 1, 2000 – JUNE 30, 2001

**DAVID C. LEVIN, M.D.**  
*PROFESSOR AND CHAIRMAN*

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## DEPARTMENT OF RADIOLOGY

David C. Levin, M.D.  
Professor and Chairman

Mark E. Schweitzer, M.D.  
Vice Chair for Clinical Practice

Vijay M. Rao, M.D.  
Vice Chair for Education

Barry B. Goldberg, M.D.  
Vice Chair for Research

Alfred B. Kurtz, M.D.  
Vice Chair for Administration

2000-2001

### DEPARTMENT CLINICAL DIVISIONS AND DIRECTORS

BODY COMPUTED TOMOGRAPHY	Richard J. Wechsler, M.D.
BREAST IMAGING/AMBULATORY RADIOLOGY	Catherine W. Piccoli, M.D.
CARDIOVASCULAR/INTERVENTIONAL RADIOLOGY	Geoffrey A. Gardiner, Jr., M.D.
GENERAL DIAGNOSTIC RADIOLOGY	Mark E. Schweitzer, M.D.
MAGNETIC RESONANCE IMAGING	Donald G. Mitchell, M.D.
NEURORADIOLOGY/ENT RADIOLOGY	Vijay M. Rao, M.D. David P. Friedman, M.D.
NUCLEAR MEDICINE	Charles M. Intenzo, M.D.
PEDIATRIC RADIOLOGY (DUPONT HOSPITAL FOR CHILDREN)	Marc S. Keller, 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.
EDUCATION COMMITTEE	Vijay M. Rao, M.D.
RESEARCH COMMITTEE	Barry B. Goldberg, M.D.
RESIDENCY SELECTION COMMITTEE	Levon Nazarian, M.D.
PERFORMANCE IMPROVEMENT COMMITTEE	Stephen Karasick, M.D.
INFORMATION MANAGEMENT GROUP	Mark E. Schweitzer, M.D.
CONTRAST COMMITTEE	Richard J. Wechsler, M.D.

**RADIOLOGY DEPARTMENT FACULTY RANK  
2000-2001**

**PROFESSORS**

Barry B. Goldberg, M.D.  
David Karasick, M.D.  
Stephen Karasick, M.D.  
Alfred B. Kurtz, M.D.  
David C. Levin, M.D.  
Anna S. Lev-Toaff, M.D.  
Christopher R.B. Merritt, M.D.  
Donald G. Mitchell, M.D.  
Vijay M. Rao, M.D.  
Mark E. Schweitzer, M.D.  
Mathew L. Thakur, Ph.D.  
Richard J. Wechsler, M.D.

**ASSOCIATE PROFESSORS**

Joseph Bonn, M.D.  
David J. Eschelman, M.D.  
Rick I. Feld, M.D.  
Adam E. Flanders, M.D.  
Flemming Forsberg, Ph.D.  
David P. Friedman, M.D.  
Geoffrey A. Gardiner, Jr., M.D.  
Ethan J. Halpern, M.D.  
Charles M. Intenzo, M.D.  
Wallace Miller, M.D.  
Levon Nazarian, M.D.  
Laurence Needleman, M.D.  
Kevin L. Sullivan, M.D.  
Lisa M. Tartaglino, M.D.  
Pamela Van Tassel, M.D.

**RESEARCH ASSOCIATE PROFESSOR**

Ji-Bin Liu, M.D.

**ASSISTANT PROFESSORS**

John A. Carrino, M.D.  
Barbara Cavanaugh, M.D.  
Diane M. Deely, M.D.  
W. Scott Enochs, M.D.  
Carin Gonsalves, M.D.  
George A. Holland, M.D.  
Sung M. Kim, M.D.  
Andrew A. Maidment, Ph.D.  
William B. Morrison, M.D.  
Patrick O'Kane, M.D.  
J. Antoni Parellada, M.D.  
Catherine W. Piccoli, M.D.  
Bidyut Pramanik, M.D.  
Ana M. Salazar, M.D.  
Sharon R. Segal, D.O.  
Rosita M. Shah, M.D.  
Susan Trevisan, M.D.

**CLINICAL ASSISTANT PROFESSORS**

Valerie Gilliam, M.D.  
Cindy Isaacson, M.D.  
Steven Lee, M.D.  
Robert Morales, M.D.  
Terri Tuckman, M.D.  
Annina N. Wilkes, M.D.  
Elaine Wolk, M.D.

**RESEARCH ASSISTANT PROFESSORS**

Laurence Parker, Ph.D.  
William T. Shi, Ph.D.

**INSTRUCTORS**

Dan Beideck, M.S.  
Susan DeWyngaert, M.D.  
Jane Hughes, M.D.

## FACULTY WITH SECONDARY APPOINTMENTS IN RADIOLOGY

Demetrius H. Bagley, M.D., Associate 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]

Mark B. Kahn, M.D., Associate Professor of Surgery [primary]  
Associate Professor of Radiology [secondary]

Donald Meyers, M.D., Assistant Professor of Neurosurgery [primary]  
Instructor 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

David C. Levin, M.D., Chairman

### CLINICAL DIVISIONS 2000-2001

#### Body Computed Tomography

**Directed by Richard J. Wechsler, M.D.**

Drs. Rick Feld, Ethan Halpern, George Holland, Alfred Kurtz, Anna Lev-Toaff, Wallace Miller, Levon Nazarian, Laurence Needleman, Ana Salazar, Rosita Shah, Susan Trevisan

#### Breast Imaging/Ambulatory Radiology

**Directed by Catherine W. Piccoli, M.D.**

Drs. Barbara Cavanaugh, Susan DeWyngaert, Valerie Gilliam, Jane Hughes, Cindy Isaacson, Steven Lee, Susan Trevisan, Annina Wilkes, Elaine Wolk

#### Cardiovascular/Interventional Radiology

**Directed by Geoffrey A. Gardiner, Jr., M.D.**

Drs. Joseph Bonn, David Eschelman, Carin Gonsalves, Kevin Sullivan

#### General Diagnostic Radiology (pulmonary, skeletal, gastrointestinal, genitourinary radiology)

**Directed by Mark E. Schweitzer, M.D.**

Drs. John Carrino, Diane Deely, Cindy Isaacson, David Karasick, Stephen Karasick, Anna Lev-Toaff, Wallace Miller, William Morrison, J. Antoni Parellada, Ana Salazar, Rosita Shah, Richard Wechsler

#### Magnetic Resonance Imaging

**Directed by Donald G. Mitchell, M.D.**

Drs. John Carrino, George Holland, David Karasick, William Morrison, J. Antoni Parellada, Catherine Piccoli, Mark Schweitzer

#### Neuroradiology/ENT Radiology

**Directed by Vijay M. Rao, M.D., David P. Friedman, M.D.**

Drs. Scott Enochs, Adam Flanders, Robert Morales, Bidyut Pramanik, Lisa Tartaglino, Pamela Van Tassel

#### Nuclear Medicine

**Directed by Charles M. Intenzo, M.D.**

Dr. Sung Kim

#### Ultrasound

**Directed by Barry B. Goldberg, M.D.**

Drs. Rick Feld, Ethan Halpern, George Holland, 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, Ji-Bin Liu, Andrew Maidment, Laurence Parker, William Shi, Mathew Thakur and Daniel Beideck, MS

DEPARTMENT OF RADIOLOGY  
HOUSESTAFF ROSTER  
2000-2001

**RESIDENTS**

**FIRST YEAR RESIDENTS**

Raymond Chang, M.D.  
Steven G. Finden, M.D.  
Laura H. Lee, M.D.  
Matthew A. Marcus, M.D.  
James T. Traiforos, M.D.  
Steven C. Wagner, M.D.

**SECOND YEAR RESIDENTS**

Brian S. Englander, M.D.  
Holly S. Gil, M.D.  
Nicole T. Glynn, M.D.  
Tariq A. Quraishi, M.D.  
Eric M. Rubin, M.D.  
Hongyu Shi, M.D., Ph.D.

**THIRD YEAR RESIDENTS**

Jaime L. Checkoff, M.D.  
Dennis C. Lin, M.D.  
Barry J. Livstone, M.D.  
Douglas D. Montgomery, M.D.  
Jonathan A. Morgan, M.D.  
Aaron O. Shiloh, M.D.

**FOURTH YEAR RESIDENTS**

Sandra O. Allison, M.D.  
Sandip Basak, M.D.  
Richard W. Epstein, M.D.  
Jennifer K. Fan, M.D.  
Andrew Kwak, M.D.  
Jennifer D. Tobey, M.D.

**Nuclear Medicine**

Henry Chih-Yuan Lin, M.D.  
Khaled El-Banna, M.D.

**FELLOWS**

**US/CT/MRI**

Eran Ben Levi, M.D.  
Antje Greenfield, M.D.  
Stephen W. McManus, M.D.  
Jennifer H. Park, M.D.  
Joan C. Prowda, M.D.  
Nancy D. Urban, M.D.  
Mihaela V. Vava, M.D.

**CARDIOVASCULAR/INTERVENTIONAL**

David S. Klein, M.D.  
Stephen R. Lowe, M.D.  
Robert T. Mariano, M.D.  
Jeffrey I. Mondschein, M.D.

**BREAST IMAGING**

Frank Paolantonio, M.D.  
Sayed Ali, M.D.

**NEURO/ENT**

Obi O. Nobl, M.D.  
Karen Bell Fuscaldo, M.D.  
Alphonso Dial, M.D.

**BODY/NEURO MRI**

Kiran M. Kapadia, M.D.  
Stacy C. Stevens, M.D.  
Maurice Yoskin, M.D.  
Anurag Khurana, M.D.

**BODY MRI**

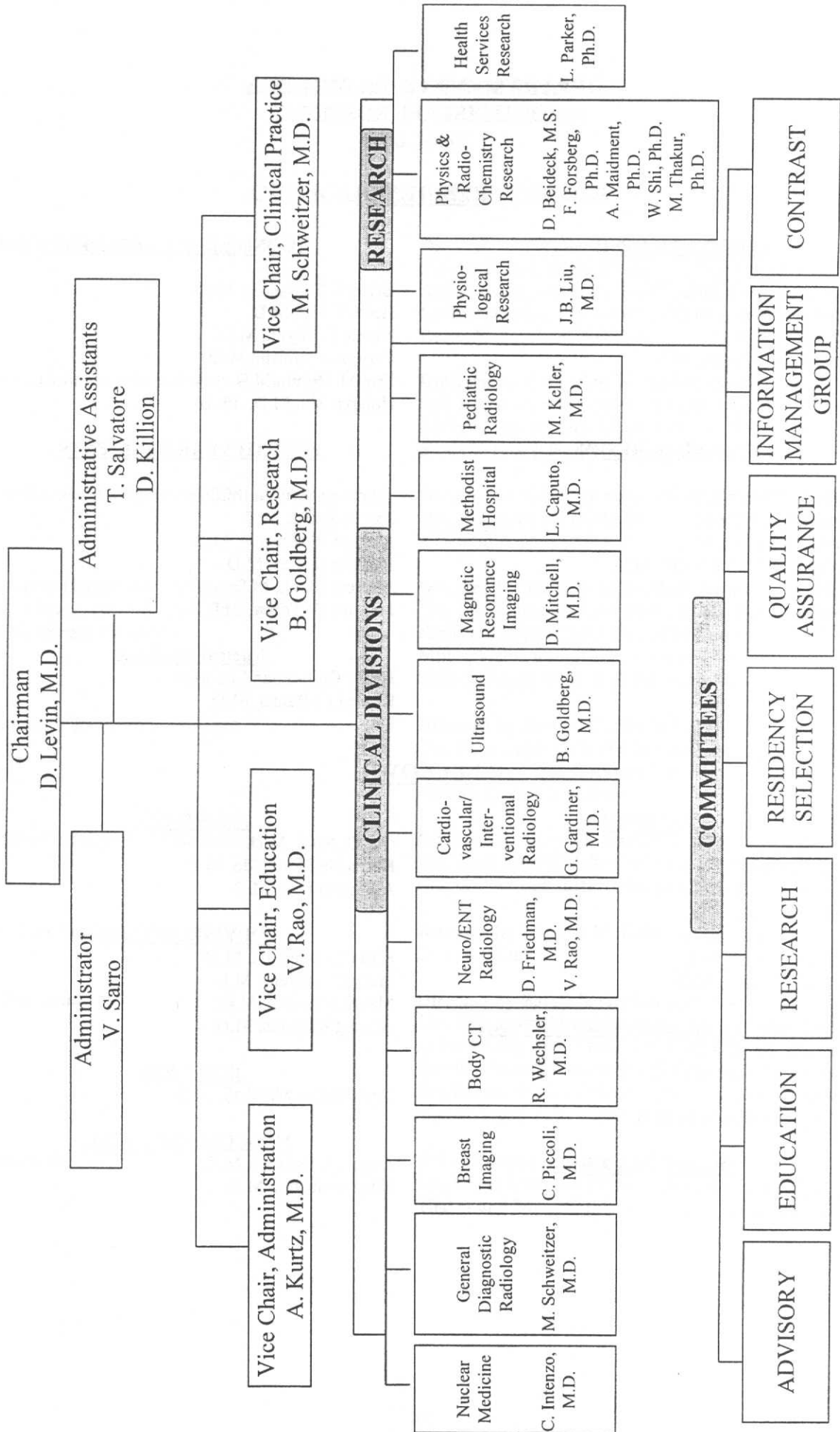
David Brant Marshall, M.D.

**MUSCULOSKELETAL**

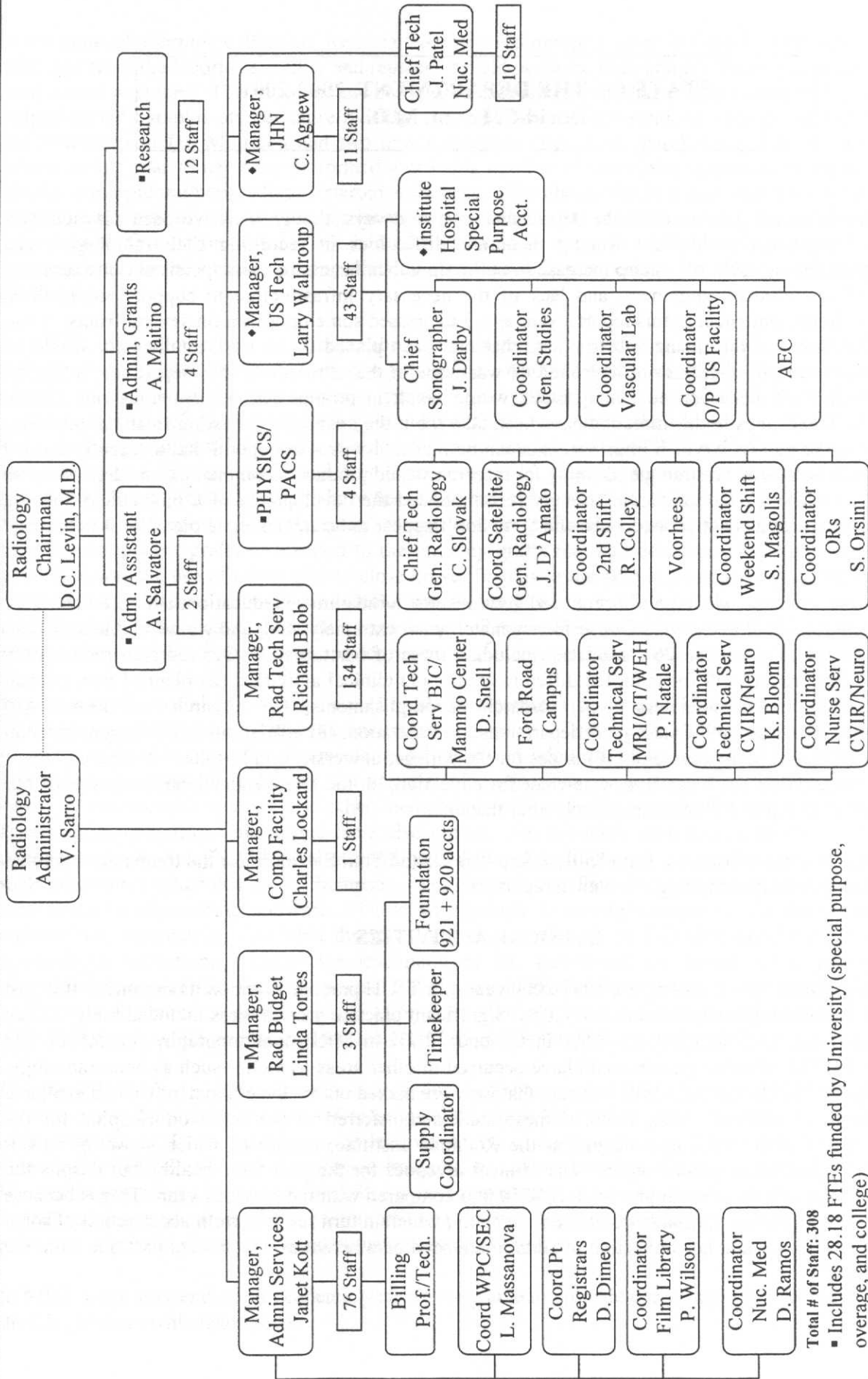
Angela J. Gessner, M.D.  
Noga Shabshin, M.D.



# Department of Radiology (2000-2001)



# Department of Radiology Administration



**Total # of Staff: 308**  
 ■ Includes 28.18 FTEs funded by University (special purpose, overage, and college)  
 ♦ 14.52 FTEs funded by Hospital special purpose account

**STATE OF THE DEPARTMENT, 2000-2001**  
**David C. Levin, M.D.**

This past year was a good one for the department in many ways, though we have been plagued by a number of persistent problems. Among them are difficulties in recruiting both radiologists and technologists, the prospect of a sharp increase in our malpractice insurance costs, persistent obsolescence of some of our clinical equipment, and lack of the necessary infrastructure to support our research endeavors. In my statement in this report a year ago, I expressed some optimism on several fronts: I was hopeful that some of the financial restrictions that had been placed on us by the university would be abated. Unfortunately that has not happened. I was hopeful that a review of the department's clinical equipment that had been carried out by ECRI would result in prompt action to upgrade our clinical equipment. Some steps in this direction have been taken, but the hospital's persisting financial problems have limited the rate with which improvements can be made. I was also hopeful that a recently-formed campus-wide task force on strategic planning for research would produce recommendations that would be acted upon. Although the task force strongly recommended the development of a biomedical imaging research center, that has not yet happened and there don't appear to be any concrete plans for it in the near future.

Despite these obstacles, we have still produced good results in the clinical, education, and research areas. Our practice continued to expand. Our residency match went extremely well, and we were able to fill our six slots from among our top 26 candidates (including three of our top six). Our research productivity increased. This report will focus on ten different areas: (1) clinical activities, (2) planned new clinical programs, (3) clinical weaknesses, (4) research accomplishments, (5) research weaknesses, (6) opportunities for extramural funding, (7) department administration, (8) affiliations and interdepartmental activities, (9) department goals, and (10) issues for the college, university and hospital. A separate report has been prepared by Dr. Vijay Rao, vice-chair for education, on the many educational programs of our department. Her report follows immediately after this one.

I am grateful to Andrea Maitino, Dara Killion, Rae Persick and Toni Salvatore for the tremendous amount of work they put in on compiling this annual report.

### **CLINICAL ACTIVITIES**

After no significant growth during the 1999-2000 year, our TJUH practice resumed its expansion this past year, with an overall growth in volume of 4.0%. Significant practice growth areas included body CT (up 34.2%), head and neck imaging (up 8.0% in CT and 38.7% in MRI), mammography (up 5.6%), and CVIR (up 14.7%). Further growth could have occurred in other areas as well – such as neuroradiology, musculoskeletal MRI, and body MRI – except that we were maxed out on the equipment we had available to perform these studies. Also, some of these studies transferred to the Jefferson Hospital for the Neurosciences (JHN) or the new magnet at the Rothman Institute, neither of which show up on our computerized procedure volume report. Our clinical revenues for the year were healthy but despite the growth in volume, were down approximately \$350,000 compared with the previous year. This is because the previous year was an unusually good one financially, which in turn resulted from acceleration of some collection procedures and late collection of certain managed care revenues which were past due from the 1998-99 fiscal year.

In the **general diagnostic division**, we installed a new radiographic room in Core 1. This equipment was relocated from the Voorhees facility and replaced an old pediatric radiographic/fluoroscopic unit that was hardly used anymore. This room is now being used extensively, and has improved our ability to process outpatient radiographic studies more quickly. Musculoskeletal interventions have grown rapidly under the leadership of Dr. Morrison and two new colleagues (Drs. J. A. Parellada and John Carrino) who joined us this year. They have performed a growing number of facet joint injections, discograms, nerve blocks, and epidural/peritendinous steroid injections. Vertebroplasty is a new service they just began performing this year, and we look for increasing growth of that procedure in the future. It could have grown much faster than it did if we had had a procedure room available in which to perform these interventions. In the **breast imaging division**, Dr. Piccoli began performing MRI-guided breast needle localizations.

In **CVIR**, a rapid increase in uterine fibroid embolization procedures occurred. Dr. Bonn and his colleagues performed 105 of them in one year alone. Another area of rapid growth was in procedures aimed at clotting dialysis access grafts. A smaller but promising new technique was immunoembolization procedures for hepatic metastatic disease, under the leadership of Dr. Sullivan. He began using granulocyte macrophage colony stimulating factor (GM-CSF) mixed with ethiodol as an embolic agent. He has performed this procedure in 15 patients so far, all with metastatic ocular melanoma. Some promising results have been obtained, but more experience will be needed to determine the value of this agent. The placement of aortic stent grafts also continued to increase, and it now includes component grafts in addition to the unibody grafts that had been used initially. Another new procedure was the use of tissue glue to close bowel fistulas to the skin in postoperative patients or those with Crohn's disease. In **neuroradiology/head and neck radiology**, the group expanded CT angiography and applications of MR spectroscopy. The latter is being used especially in patients with seizure disorders. Dr. Enochs began performing CT-guided biopsies of head and neck lesions.

In **ultrasound** several interesting new clinical developments occurred. Under the leadership of Dr. Nazarian, musculoskeletal ultrasound continued to develop. They are using this technique to diagnose disorders of tendons, muscles, ligaments, and bursae. In addition, using ultrasound guidance, they are now able to percutaneously debride scar tissue and calcifications and perform therapeutic injection of the damaged tissues with steroids and other medications. The results have been very promising. Other aspects of interventional ultrasound have also grown. On my daily rounds through the department, I commonly see as many as 14-18 ultrasound-guided biopsies, drainages, therapeutic injections and other such procedures scheduled on 7 Thompson. Drs. Merritt and Piccoli began clinical evaluation of real time spatial compounding software. There was growth in sonohysterography for the evaluation of endometrial, myometrial, and tubal disorders and also in the use of 3-D ultrasound for obstetric and gynecologic indications. Under the leadership of Dr. Lev-Toaff, we began using prototype 3-D ultrasound equipment for these purposes. Finally, we began implementation of our ultrasound picture archiving and communication system (PACS) from Canon. We have unfortunately run into problems with this system, which needs considerable work before it is "ready for prime time".

In **body CT**, there was strong growth in procedure volume, and outpatient hours were extended at JHN. Development of any dramatic new CT techniques was impeded by the age of our equipment and the lack of multidetector CT. In **nuclear medicine**, we began using the Marconi Axis molecular coincidence detector for SPECT myocardial perfusion imaging, as well as imaging of tumors, thyroid and adrenals. We also began using a refined protocol for outpatient treatment of thyroid carcinoma. New methods were introduced for evaluation of pheochromocytoma (using somatostatin receptor imaging) and also for palliation of painful skeletal metastases (using samarium-153).

In **MRI**, at the very end of the academic year we were able to upgrade our second MRI unit in the COB to the LX platform with echo speed.

Our **outside contracts** continue to be an important part of our practice. This was our first full year of operation at Doylestown open MRI, and the magnet located at the Rothman Institute also began operations. Our volume at Open-sided MRI continued to expand. The only slightly negative development was our loss of the Marlton MRI contract, the result of a somewhat arcane New Jersey regulation that requires the presence of a radiologist whenever contrast material for MRI is administered. We could not provide such coverage and therefore had to drop the contract. Our other outside ventures (Langhorne MRI, Bala MRI, Academy Imaging Center, and JHN) continue to go well.

### CLINICAL WEAKNESSES

Our most pressing clinical weakness pertains to equipment. We have been lacking certain key pieces of equipment that virtually all other major academic radiology departments possess – such as multidetector CT, digital radiography, a PET scanner, and a neuroangio room. For example, we are probably going to be one of the last hospitals in Philadelphia – both academic and community – to install multidetector CT. Absence of equipment like this has prevented us from being able to maintain our position as a cutting edge department. Despite the fact that we have lots of equipment in other areas, we still don't have enough of it to meet the clinical demand. Significant backlog exists in MRI, CT, ultrasound, and mammography. I recently conducted a survey of our referring physicians, the results of which indicate that we are losing about 100 MRIs and 85 CTs *per week* to other institutions because of our backlogs here. We also lacked a procedure room for musculoskeletal interventional procedures. Closely related to these problems is obsolescence of the equipment we do have. We have run into this problem in MRI, ultrasound, and nuclear medicine. The ECRI recommendations that I referred to in last year's report were by and large on the mark, but the problem is the hospital does not have sufficient capital budget dollars to implement those recommendations. A number of these weaknesses will be corrected, as will be detailed in the next section of this report.

Another serious problem relates to personnel. A critical shortage has developed nationally of both radiologists and radiologic technologists. Recruiting is more difficult than at any other time I can remember during the course of my career. Within recent months, three faculty members in our Breast Imaging Center have decided to leave, as well as one faculty member in neuroradiology and one in chest radiology. We have some possible prospects for the latter two positions, but no one seems available for the breast imaging positions. As a result, we are going to have to drastically curtail breast imaging services this year.

PACS is another problem. Our PACS vendor, Canon, has not been as responsive as we would have hoped in implementing upgrades and necessary changes. This is particularly true in ultrasound. We had planned to implement a full ultrasound PACS this spring, but due to defects in the system, that has not yet happened. We have had numerous discussions with Canon, but it has yet to be determined whether they will respond to our needs. If not, we may well have to consider switching entirely to another vendor. Another problem related to PACS is that our system is chronically underfunded. Emory University Hospital spent approximately \$16 million on its PACS, while the University of Pittsburgh spent approximately \$20 million on theirs. Jefferson's total investment so far has been only about \$1 million, some of which was paid by our department and some of which was paid by an outside company. We have driven a very hard bargain with Canon and because we are their prime development and testing site, they have given us far more equipment than we've paid for. This may have lulled the hospital administration into a false sense of complacency about PACS. It requires a large capital investment, sufficient support personnel, and a service contract. The payoff for a hospital is elimination of the cost of film, elimination of the problem of lost cases, more rapid dissemination of images around the hospital and medical campus using a web server, more efficient workflow for technologists, reduction in the need for film librarians, and movement towards the implementation of the all-electronic medical record.

Another problem relates to patient transport. Many times we find our high cost equipment sitting idle because there isn't an efficient system for transporting patients. This is quite frustrating at a time when we are experiencing major backlogs.

We are still continuing to have problems turning our radiology reports around quickly enough. This is a multifaceted problem, which I have harped upon continuously at our faculty meetings. Some of our faculty are very diligent about signing their reports promptly, but others aren't. Keeping a workforce of capable transcriptionists has been another major problem. One would think that with the economy much slower now than it was a year ago, transcriptionists would be readily available. Unfortunately, they still seem to be in short supply.

### PLANNED NEW CLINICAL PROGRAMS

The most important of our clinical plans for the coming year is the development of a new outpatient imaging center. This will be jointly owned by the department of radiology, the hospital, and a private company (OIA of Nashville). The genesis of the idea was the strong and continuing demand for our services, which cannot be met with the equipment we currently possess. This facility (which is still in the early planning phase at the time of this writing in July 2001) will contain a new MRI, multidetector CT, two ultrasound units, a PET scanner, a computed radiography room, and a DEXA scanner. The exact location has yet to be determined but it will be within close proximity to TJUH.

Another important development will be further progress toward our transition to all-electronic radiography, using a combination of computed radiography (CR) and direct digital radiography (DR). The tentative plan at the moment is to install CR in Core 1, the emergency room, and also to begin using it for portable x-rays. We also plan a digital radiographic/fluoroscopic room.

A third major project is to continue expansion of our PACS to ultrasound and nuclear medicine. The ultrasound implementation is underway at the present time, but it is going more slowly than anticipated because of the problems with Canon alluded to earlier.

There are a number of other new programs and improvements planned for some of the clinical areas. In the **general diagnostic division**, we plan to expand our musculoskeletal interventional activities, particularly in vertebroplasty and an even newer procedure, kyphoplasty. The hospital administration has agreed to give us a new procedure room which will be located in **CVIR**. This badly needed procedure room will accommodate our musculoskeletal interventions and will also be used by CVIR to expand their involvement in dialysis graft declotting procedures, venous access, and tube checks/changes. The room will also be used for myelograms and other neuroradiologic procedures and for lung biopsies. CVIR is continuing to work with the vascular surgery division and we anticipate the formation this year of a joint vascular disease treatment center. At the **Breast Imaging Center**, we are very appreciative of the help Scott Eldredge has provided in identifying a source of funding for some badly needed new personnel to help improve the working efficiency of the radiologists there. This will include the hiring of a new ultrasound technologist, a floor manager, a technical assistant, and a data entry person to handle various FDA requirements.

In **ultrasound**, we plan to expand in areas like sonohysterography, diagnosis and treatment of musculoskeletal disorders using ultrasound guidance, and ultrasound evaluation of skin and subcutaneous lesions. In **body CT**, we expect to purchase our long-awaited multidetector CT. This will get us into the modern era of CT scanning and allow us to begin working on things like improved CT angiography, coronary calcium screening studies, virtual colonoscopy, other screening programs, and cerebral perfusion studies. We anticipate that it will also allow faster throughput of patients.

In **MRI**, we will be upgrading our Main 10 unit to the LX platform. In **nuclear medicine**, as noted earlier we will be introducing PET as part of our outpatient facility. This will allow us to carry out far more effective imaging and staging of tumors using 18-FDG. PET can also be of value in studying patients with epilepsy and coronary artery disease. The division also plans to reorganize work flow to increase throughput and decrease backlogs of patients needing stress myocardial perfusion imaging. Working in conjunction with the emergency department, they will establish a critical pathway to diagnose pulmonary emboli, using measurement of d-dimer.

## RESEARCH ACCOMPLISHMENTS

Our department again compiled a strong research record, a feat which is especially notable given the large increases in clinical workload that have affected almost all our divisions. Radiology investigators this past year produced 297 publications in the medical literature (including journal articles, books and book chapters, and published abstracts). This number is up considerably from the 233 publications we had a year ago. At the annual meeting of the RSNA (the largest and most competitive radiology meeting in the world), our department faculty or trainees authored or co-authored 69 presentations, up from 61 the previous year. We also had a strong presence at the AIUM, the largest ultrasound meeting in the world.

In terms of grant support, we had a total of 53 grants or contracts from outside sources – 16 from the NIH or other federal agencies, 10 from foundations or nonprofit medical organizations, and 27 from industry. The total funding covering the entire lifetime of these grants was slightly over \$11 million (including both direct and indirect). For the 2000-2001 fiscal year itself, our total grant support was \$1,747,939 direct and \$588,841 indirect, for a total of \$2,336,780. The number of grants and amount of grant funding are somewhat down in comparison with last year. However, this is hardly surprising given the aforementioned increase in workload, as well as the lack of an imaging research laboratory and the inadequacy of our research infrastructure. The fact that we accomplished as much as we did is a great tribute to our faculty.

In **ultrasound** important research was carried on in both the basic and clinical spheres. Drs. Forsberg and Shi worked on novel imaging techniques which they have largely been responsible for developing – such as subharmonic imaging and excitation-enhanced imaging. Their work has been supported by both the DOD and Whitaker Foundation. Their long term goal is to produce a commercial product, and these efforts were recently recognized by the NIH, which funded an SBIR Phase II proposal. They also proposed a new index for predicting thresholds and rates of contrast microbubble destruction in ultrasound fields, which will enable clinicians to select optimal parameters in the use of ultrasound contrast agents. Dr. Merritt worked on an NCI Program Project subcontract on the evaluation of ultrasound elastography, an intriguing new technique which offers the potential of providing much better image contrast. Dr. Liu continued and expanded his studies of 3-D endoluminal ultrasound and he also published on the role of contrast-enhanced ultrasound in radiofrequency ablation of liver tumors. Other areas of research focus within the division include evaluation of antiangiogenesis, ultrasound contrast agents, and imaging of the prostate, subcutaneous and musculoskeletal structures, female pelvis, and breast. Dr. Halpern received a DOD grant for a 3-year study of prostate cancer detection using contrast-enhanced ultrasound. He has already published several papers on the subject this past year, including one in the prestigious journal *Lancet*. Dr. Nazarian won an RSNA seed grant to study vascularity and growth of melanoma in an animal model, using color Doppler and ultrasound contrast. Dr. Feld completed a study of the use of intraoperative ultrasound in surgical treatment of breast masses. As a result of her publications, Dr. Lev-Toaff has become a widely recognized authority on 3-D ultrasound and the use of sonohysterography in obstetrical and gynecologic conditions. Under the overall direction of Dr. Goldberg, our ultrasound division continues to be the best in the world in both quality and quantity of their research.

Our **musculoskeletal imaging group** has also moved to the forefront nationally and internationally as a result of their astounding research productivity. Dr. Schweitzer published 23 papers either as first author or second author when either a trainee or medical student was the first author. He also published 13 such abstracts. Dr. Morrison published 8 such papers and 11 abstracts and won the first annual Judy Dubbs Memorial Research Award, given to the junior faculty member deemed to be the most productive in research. Drs. Carrino and Parellada joined our musculoskeletal group this year and both of them showed impressive research capability. At the 2001 RSNA meeting coming up this December, the musculoskeletal group has 22 abstracts accepted – an incredible number. Elsewhere in the **general diagnostic division**, Dr. Shah published a study of the impact of histology on dominant CT patterns in bronchioloalveolar cell carcinoma, and another one on the effect of HIV seropositivity on the radiographic appearance of pneumococcal pneumonia.

In **breast imaging**, Drs. Maidment and Piccoli completed accrual of cases for their NIH grant on clinical evaluation of digital mammography and also on Dr. Maidment's DOD-funded 3-D analysis of breast microcalcifications. Dr. Piccoli and her colleagues will shortly begin an NIH-funded trial comparing digital and screen-film mammography under ACRIN auspices. We have recently acquired a new digital mammography unit to use in this research. In **nuclear medicine**, Dr. Thakur continued work on imaging tumors by use of vasoactive intestinal peptide (VIP) receptor agonists, and also on imaging infection using radiolabeled leukokinin and chemotactic peptides. Part of this work was funded under an SBIR grant from NIH. He continued to work on imaging vascular thrombosis using fibrin-specific peptides, also under an SBIR grant. He published articles dealing with the use of labeled peptides in imaging infection, colorectal cancer, and other tumors. Dr. Intenzo worked on a number of projects, including the use of Cerivastatin for hyperlipidemia in post-menopausal women, intraoperative localization of parathyroid adenomas, and the treatment of thyroid cancer using radionuclides.

In **CVIR**, under Dr. Bonn's leadership, we have been selected as one of 25 participating sites nationwide for a uterine artery fibroid embolization registry sponsored by the SCVIR. Dr. Gonsalves completed and validated STAR registry data covering more than 3500 procedures at 7 different medical centers. She and her colleagues hope to begin publishing the results shortly. Dr. Eschelmann published an interesting paper showing an inverse relationship between clinical and academic productivity in academic radiology departments. In **neuroradiology**, Dr. Friedman continued his studies of the use of MRI to evaluate patients with various lesions following gamma knife stereotactic radiosurgery. Dr. Flanders worked with Dr. Madi on a paper (now in press) dealing with task-dependent BOLD signal from the human spinal cord, using ultrafast functional MRI. Dr. Rao (with Dr. Parker and I as co-authors) had a paper accepted on utilization trends and geographic variations in neuroimaging. She completed several other studies pertaining to aspects of utilization of neuroimaging, and one study proposing a valuable new CT-based classification of orbital floor fractures. In **body CT** Drs. Park and Nazarian compared pre and post-contrast spiral CT for assessing interval changes in colorectal carcinoma metastases to the liver. For this work, Dr. Park won the AUR Memorial Award, which was presented to her at the annual AUR meeting in Toronto. This is a prestigious award for the best abstract presented by a resident. The paper will be published shortly. Dr. Halpern continued his work on CT angiography of renal arteries, as well as on the detection of complications following aortic stent grafts.

Our **body MRI** division continued to be productive. As a group, they published 14 papers on abdominal, pelvic, or breast MRI. In **health services research**, Dr. Parker's ability to analyze both Medicare and private insurance databases contributed to a number of projects. He worked with Dr. Rao, myself and several others on 13 presentations given at last year's RSNA, and we have another 16 that have been accepted for this year's RSNA. Dr. Parker had 22 published abstracts last year. Some of us are now in the process of getting several of these projects published as full manuscripts. The work deals with utilization rate changes in cardiac nuclear imaging, echocardiography, other types of ultrasound, MRI,



MRA, breast biopsy, conventional radiography in emergency departments, and endovascular neurointerventions. We continue to be one of the very few academic radiology departments in the country that is actively involved in studying practice patterns and regional variations in utilization of diagnostic imaging.

## RESEARCH WEAKNESSES

We faced many of the same shortcomings in our research program this past year as in the previous year. The most serious of these is the restriction the university has placed upon our ability to spend our own dollars to support research in the department. The current policy denies us access to our overage fund reserves, which are now quite large. We have been told instead that we can only utilize the dollars that accrue to our overage fund in the current fiscal year. However, an additional \$593,000 limitation has been placed against even those expenditures. We do not receive any interest payments on our large overage fund reserves, which sit in university accounts. Unfortunately, it does not appear that there will be a change in policy during the coming year. Unless we are allowed to use our own money to develop a research infrastructure, there will be no opportunity for us to be competitive for NIH grants or to build a viable basic research program. Most other good academic radiology departments have imaging laboratories that have been developed through a combination of university and department funds. We are not able to acquire such facilities, as a result of the policy described above.

Last summer, I presented a proposal to a campus-wide task force on strategic planning for research at Jefferson. My proposal was for development of a Jefferson Biomedical Imaging Research Support Center – to include a 3.0T whole body MRI unit, two smaller bore animal magnets, a coil laboratory, an ultrasound lab which included a scanner and four other pieces of research equipment, a PET scanner, an image fusion lab, an optical coherence tomography unit, and an x-ray physics laboratory. The task force recognized that imaging was an important component of many research projects, not only here in radiology but all around the campus. They were quite supportive of this plan. However, I have not heard any more about it since then, and I am not optimistic that this badly-needed facility will come to pass.

Another research shortcoming this past year has been our clinical equipment. Without the aforementioned research facility, we can't do good basic science research in imaging. However, with the proper clinical equipment, we could at least do some valuable clinically-oriented research. Unfortunately, our clinical equipment is also lacking in certain key areas. The best example of this is multidetector CT. Virtually all the high quality clinical research being carried out in CT these days requires the use of multidetector technology, something we do not have at the present time in our department. We also lack a PET scanner. Another growth area for clinical research is in the application of interventional techniques to musculoskeletal disorders. Under the leadership of Drs. Morrison, Parellada, and Carrino, we have begun to develop a very active practice in this area, but the big problem is that we haven't had a procedure room in which to perform these interventions. This has limited the growth of the program and has also limited our ability to compile the case material for research. Fortunately, it looks like these clinical equipment problems can be rectified during the coming year.

Since the mid 1990s, we have lost four basic research faculty positions that used to exist in our department. Those positions are for two MRI physicists, a vascular physiologist, and a nuclear medicine physicist. We have not been able to replace these individuals because of the aforementioned financial restrictions placed upon us and our need to cut costs to meet them. This has obviously had a very negative impact on our research program. The most pressing need is for an MRI physicist. Unfortunately, without any research magnets or the ability to recruit computer programmers or other junior people to assist him or her, there isn't any way we will be able to recruit a qualified physicist to come here.

## OPPORTUNITIES FOR EXTRAMURAL FUNDING

Table 2 of the appendix lists our current pending grant proposals. Most of them are related to ultrasound, which has traditionally been our strength in obtaining outside grant funding. This is due to strong leadership by Drs. Barry Goldberg and Flemming Forsberg, and they deserve great credit.

There have been some interesting opportunities from NIH in recent years, through their Shared Instrumentation Grants, and the recently announced High End Instrumentation Program of the National Center for Research Resources (NCRR) at the NIH. The latter would provide support of up to \$2.0 million in direct costs for a single major item of advanced equipment. The program announcement specifically lists functional MR and PET imaging as the types of technology that might be appropriate for a proposal. However, the announcement stipulates that in order to qualify, there must be an institutional commitment to support the associated infrastructure for such an instrument. Also, they expect a high level of technical expertise to be available to operate and maintain the instrument and to conduct experiments. Unfortunately, Jefferson does not meet either of these requirements at the present time. In the previous section, I alluded to the need for us to be able to access our overage fund reserves to develop the necessary infrastructure to support a high quality research program. Only when we have that will we be able to compete for these types of NIH grants.

In last year's report, I described the American College of Radiology Imaging Network (ACRIN), a national, NIH-funded, multi-institutional research group set up to analyze the use of imaging technologies in many different forms of cancer. Jefferson is a participating institution. We are involved in studies on the imaging of cervical cancer, a screening trial of digital mammography compared with screen-film mammography, and we will soon be part of a study of percutaneous radiofrequency ablation of bone metastases using CT guidance. ACRIN does not provide large amounts of funding, but the concept is an interesting and highly valuable one.

The NIH recently established a new institute, the National Institute of Biomedical Imaging and Bioengineering (NIBIB). This new institute should increase the availability of imaging-related grants. Under Dr. Barry Goldberg's leadership, we have had a longstanding relationship with Drexel's department of biomedical engineering. Since NIBIB focuses both on imaging and bioengineering, it is possible to envision us and the Drexel group working together on obtaining funding.

## AFFILIATIONS AND INTERDEPARTMENTAL ACTIVITIES

As always, our department interacts with almost every other clinical department in the hospital on a daily basis. We have numerous joint research projects, and our faculty members frequently participate in teaching conferences sponsored by other departments. Some of our more specific and important interdepartmental activities are as follows:

Our work at Jefferson Hospital for the Neurosciences (JHN-formerly Wills Eye Hospital) remains a key cornerstone of our activities. The department of radiology at JHN is now consolidated within our TJUH departmental administration and Mr. Pete Natale has assumed administrative leadership there. We continue to provide all coverage of the JHN CT and MRI scanners. Our neuroradiologists are collaborating with some of the neurosurgeons at JHN on research projects. In a related area, we are working with Joseph Tracy, Ph.D. of the department of neurology on functional MRI of the brain. We have provided him with magnet time in the COB, despite the major backlogs we are facing.

Dr. Gardiner in CVIR and Dr. Carabasi from vascular surgery are still working to develop a joint Jefferson Vascular Center. This would, I feel, be a very good development for both departments and for

the hospital. The discussions have been protracted but they seem nearing completion, and the one remaining issue appears to be where the joint office will be located.

Our department and the department of obstetrics and gynecology have worked out an agreement on the responsibility for obstetric and gynecologic ultrasound. This often-contentious issue has been resolved relatively satisfactorily, and in a way that will continue to provide appropriate training for residents and fellows in both departments. In another area of collaboration, members of our ultrasound division continue to work with faculty members in the departments of radiation oncology and medicine on research in the use of antiangiogenesis agents. Under Dr. Halpern's leadership, we are also doing joint studies of the utility of contrast-enhanced ultrasound in the detection of prostate cancer with the department of urology. We are working with the division of gastroenterology in studying the use of endoscopic ultrasound in detecting and staging lesions of the esophagus and stomach. We continue to collaborate in research with the Drexel department of biomedical engineering. As noted earlier, with the formation of NIBIB, we hope this latter collaboration will prove even more fruitful in the future.

We continue a close relationship with the radiologists at the duPont Hospital for Children, who provide pediatric radiology coverage in our department three afternoons per week. We also continue to have a working relationship with Dr. Larry Caputo and his colleagues in the department of radiology at the Methodist Hospital division. I periodically discuss matters of joint interest and concern with Jim Robinson, CEO of the Methodist Hospital division. We are currently in the process of trying to shift some of our mammography backlog to Methodist, where it is likely that patients could be accommodated more expeditiously because of staffing problems at the BIC.

Last but not least, we are collaborating with the department of orthopedic surgery in the operation of the new MRI unit at the Rothman Institute. This has increased our ability to provide prompter service to referring physicians for all types of MRI examinations. Even with the addition of this new magnet, we still continue to have significant backlogs.

### **DEPARTMENT ADMINISTRATION**

A major administrative change we instituted this past year was the formation of the Information Management Group (IMG) under the leadership of Dr. Mark Schweitzer. Over the next few years, virtually all radiology departments in the country will be transitioning to what might be called the "all-electronic radiology record". In essence, we will become filmless and paperless. The IMG replaces several other committees and groups that had been functioning independently and will hopefully allow for this major transition to occur in an orderly and coherent way. Some of the major responsibilities of this group will be: (1) acquisition of a new radiology information system (RIS), (2) extension of our PACS, (3) development of image distribution capability using a web server, (4) implementation of electronic order entry, (5) implementation of computerized scheduling, (6) transition to all-digital imaging, (7) interfacing our new RIS and PACS to the hospital information system, (8) interfacing the new RIS to the IDX billing system, (9) introduction of voice recognition and/or structured reporting, (10) upgrading our department web page. The group has been meeting every other week, but there are so many difficult issues that the meetings may have to become weekly.

Under the capable leadership of Mr. Victor Sarro, a number of administrative accomplishments occurred this past year. One of the most important was the successful completion of the JCAHO survey. As always, this required a tremendous amount of time and preparation but our administrative team carried it off very well. Another major accomplishment was the integration of the JHN radiology department into the main TJUH department. This transition is still ongoing. As part of it, we have been able to expand the CT and MRI schedules at the JHN in order to help us cope with our backlogs.

Planning took place for a number of major new developments. One of the most important is the installation of a new RIS. This is a huge undertaking. Mr. Sarro and Mr. Charles Lockard developed a very detailed RFP which was sent to a number of the major RIS vendors. We are now starting to get back proposals and will begin comparing the various systems and making site visits in the near future. We are planning the joint vascular disease center with the division of vascular surgery. This was a complicated undertaking and the groundwork has now been laid. We are hopeful the hospital administration will be able to provide the new center with appropriate space. Planning also took place for a remodeling of our breast imaging facilities, the patient waiting areas on 3 Gibbon, and the third floor radiology classroom. Working with Facilities Planning, Mr. Sarro did an excellent job in designing these very necessary improvements to our physical plant.

Several important new installations took place this past year – including a new radiographic room on 3 Gibbon, a new molecular coincidence detector camera in nuclear medicine, the Stentor web server for distribution of CT and MRI images around the campus, an upgrade of one of our MRI units in the COB to the LX platform with echo speed, and the introduction of the Canon PACS in ultrasound. Unfortunately the latter installation has not gone smoothly, due to failure on the part of Canon to properly develop the system. We are currently working with them to try and alleviate its defects.

In the area of personnel, we were able to recruit Mr. Tony Arroyo as assistant manager of our RIS and PACS. This was a badly needed position and we appreciate the support of the hospital administration in providing it. A much more global personnel problem was the technologist shortage, which has become a serious issue for us and most other hospitals around the country. Mr. Sarro has worked very hard on this and fortunately was able to convince Human Resources to make a salary adjustment. Nevertheless, this remains an ongoing problem and it is obvious we will have to devise new and innovative ways to recruit and retain good technologists.

### **DEPARTMENT GOALS**

**Establishment of a new outpatient imaging center** – I alluded to this earlier, and it is our top priority in the clinical area. This entity will have a complex legal and financial structure, and we are currently working our way through the details. It will be the department's first venture into ownership of equipment, using leasing arrangements. We look to this center to once and for all eliminate our backlogs in MRI, CT, ultrasound, and DEXA, and to allow us to introduce PET to the Jefferson campus.

**Upgrade our existing on-campus equipment** – There are several major capital projects either underway or to start soon that will significantly improve the status of our equipment. We have just finished upgrading one of our MRI units in the COB to the LX platform with echo speed. Our Main 10 magnet is slated for the LX upgrade in the near future. We are due to replace one of our CT scanners with a new multidetector unit, a much needed and much anticipated arrival. The new angiography room will be installed on 5 Gibbon, which will greatly help us meet the demand for musculoskeletal interventions and expansion of our CVIR services. We are going to be introducing digital radiography in our general diagnostic division. All these projects are complex and one of our major goals for this year is to see to it that they are accomplished expeditiously and cost-effectively.

**Establish an imaging research center serving the entire campus** – As noted earlier, this is a critical cornerstone of our future plans in research. The first things that have to be accomplished are finding space and funding, and it isn't clear at this time how either of these problems will be resolved.

**Recruitment and retention of faculty, fellows and technologists** – Faculty turnover has become a problem, as a serious nationwide shortage of radiologists has developed. Within the last several months, five faculty members have informed me they will be leaving. Four of them are going to other academic

medical centers; the fifth has not yet decided what her future plans will be. This recent trend is obviously of concern. We need to do everything possible to make Jefferson an attractive place for a faculty member to make his/her career. I have recently had a number of discussions with the Dean and senior hospital administration about the need to take certain financial and other steps to accomplish this, but these problems have not yet been resolved. There is also a serious shortage of radiologic technologists. The faculty and administration of our department must work closely with the hospital administration to recruit and retain qualified techs. Fellows are another issue. Like virtually every other academic institution around the country, we have had a number of fellows renege on commitments they had made previously to come here for fellowship training. While there isn't anything we can do to improve the ethics of fellowship candidates, we need to take steps to optimize the learning environment and our attractiveness to prospective fellows.

**Move toward the all-electronic radiology record** – As I noted in last year's report, this will be a huge undertaking that will require years of planning, hard work, and the expenditure of sufficient funds. Despite the challenge, we have to meet it successfully because this is clearly the future direction of radiology. By the term "all-electronic radiology" I mean the abolition of film and paper. Achievement of this goal will result in electronic order entry and scheduling, all-digital imaging and the use of PACS throughout the department, a new radiology information system (RIS), voice recognition, image distribution via the web to PCs of referring physicians, and completely electronic billing. We have been working with PACS for several years now and during the coming year, we will be evaluating and then installing a new RIS. The choice and installation of this system is especially critical because it is the basis of virtually all our departmental operations.

**Continue to support international education in ultrasound** – Dr. Barry Goldberg has done outstanding work in fostering international education in ultrasound. Under the auspices of the Jefferson Ultrasound Research and Education Institute (JUREI) his educational programs have carried to almost all corners of the earth. A group of African radiologists has just arrived and will be here learning the latest techniques in ultrasound for three months. This program has been a very effective "teach the teachers" initiative, which has led to 44 Jefferson-affiliated centers around the world. We certainly want to continue to promote this type of activity.

**Establish a cardiac imaging program** – Advanced cardiac imaging with MR and CT angiography is becoming more feasible every month. I predict that within the next 10-20 years, MRA or CTA of the coronary arteries will replace diagnostic cardiac catheterization. Dr. Mitchell has had discussions with Drs. Zwas of the cardiology division about the possibility of developing a joint cardiac imaging program.

**Improve our website** – All of us have been so busy that we have neglected to update the department's web page. We had been waiting for a new package from Canon to do the updates, but that package has not yet materialized and we're getting a bit tired of waiting. We will probably decide to either go with a commercial website developer or do it in conjunction with the hospital. More and more, patients are seeking health information on the web, and we need to be there with a fully updated and informative page.

## ISSUES FOR THE COLLEGE, UNIVERSITY AND HOSPITAL

The first four of these issues were discussed in last year's report. The problems still need to be resolved.

**Development of a Jefferson Biomedical Imaging Research Support Center** – As noted earlier, over a year ago, I had recommended this to the Task Force on Strategic Planning for Research that had been convened by Dr. Thomas Nasca. A number of other clinical and basic science departments on the campus also supported the need for such a facility. It would include things like a 3T whole body MRI, smaller

bore magnets for animal work, and a host of other pieces of imaging equipment. Without such a facility, our department's ability to compete for outside research grants is very limited. Furthermore, this isn't just a radiology issue; other departments on the campus need to use imaging equipment in their own research. There has been no discernible progress on this over the past year, and I am hopeful that it can continue to maintain a high priority in the long range plans of the university.

**Access to departmental research (overage) funds** – University policy still denies clinical departments access to the reserves in their overage funds. This has seriously hampered research and teaching programs in our department, and I'm sure in other departments as well. In order for Jefferson to continue as a high quality academic medical center, the clinical departments must be permitted to use the reserve funds which we ourselves have built up in order to create the necessary research infrastructure. As I pointed out in last year's report, this situation could lead to disastrous results for Jefferson's academic programs and stature if it isn't rectified quickly. If we aren't allowed access to our overage fund reserves, at the very least we ought to be able to use the interest income produced by that fund. Unfortunately, we have also been denied this source of income.

**Modernization of our equipment and physical plant** - Throughout numerous discussions Victor Sarro and I have had with the hospital administration, they readily acknowledge that our equipment is out of date and in many cases inadequate. As noted earlier, at the moment we are one of the few academic medical centers anywhere in the country that lacks multidetector CT capability. Fortunately, one of these units is in our capital budget for this year and we will be adding it shortly, with another one to follow soon thereafter in the new outpatient imaging center discussed earlier. This new imaging center should be a boon to our department and the hospital. The use of creative leasing plans and joint venturing with an outside company are good ways for us to move forward, and I hope both the hospital and university administrations will support us as we move forward in this venture and perhaps others like it in the future.

**Dean's Tax** – In last year's report, I pointed out that Jefferson was the only medical school in the country in which the Dean's tax is taken as a percentage "off the bottom" after all expenses have been paid by a department's practice plan. This year, Dean Nasca has announced that the tax will henceforth be taken off the top, through a process that will be phased in during the 2001-02 fiscal year and the ensuing two years. The problem is that we are being seriously disadvantaged during the transition years because we are being asked to pay a fixed Dean's tax which exceeds our ability to pay. I am hopeful that further discussions with the Dean will put us in a more equitable position.

**Deficit in Ph.D. support** – We are currently down four Ph.D. positions, compared with where we were several years ago. At that time, we had two MRI physicists, one nuclear medicine physicist, and one vascular physiologist on our faculty. All those individuals have now left and we have never replaced them. The reason we cannot hire people to fill these vacancies is that we have not been allowed to access our overage fund reserves. Without that, there isn't funding available to support their salaries or the research equipment and infrastructure they would need. This seriously impairs our ability to conduct a well-rounded research program in diagnostic imaging. The lack of an MRI physicist is particularly acute; we are the only major academic radiology department I know of that doesn't have even one such individual. The lack of a nuclear medicine physicist is also going to be problematic when we begin operating our PET scanner.

**Retention of technologists** – This was another problem I mentioned in last year's annual report. Since then, the situation has gotten worse rather than better. We continue to lose some of our best technologists to private outpatient imaging centers and even to other competing academic institutions here in the city. Those institutions are facing the same financial problems as Jefferson, yet they seem to be able to offer higher salaries. Jefferson needs to be proactive in this area and make absolutely sure its salaries for highly trained key personnel like technologists are fully competitive.

**Faculty retention** – During the fourteen years prior to the 2000-01 academic year, our department had an outstanding record in faculty retention. Aside from those people leaving to take more lucrative private practice jobs, only a very small number left to take other academic positions. If one sets aside one individual who left to become chairman of another academic radiology department (Dr. Rifkin in 1991) and three others who left because of geographic preferences or to accompany a spouse, (Drs. McComb in 1991, Outwater in 1999, and Spirn in 2000), only four faculty members voluntarily left the department in those fourteen years to go to other academic positions. However, just this past year, we seem to have had an epidemic. Five faculty have submitted their resignations, of which four are going to other academic centers and one has yet to determine her job preference. I have expressed my concern to the Dean that this may indicate we are no longer able to keep our faculty as satisfied as we should. I am particularly concerned about faculty retention in upcoming years, when we are facing some serious new financial burdens. These include such problems as increasing malpractice costs; reduction in faculty salary support from the hospital; increased billing charges; a Dean's tax which (as noted earlier) is beyond our means to pay; the possible requirement of an additional payment to the medical college over and above our research fund budget; withholding of interest payments on our overage fund reserves; and reduction in financial support from Jefferson Medical College. Aside from the increased malpractice costs which are beyond the control of anyone here on campus, all the other problems have been imposed upon us by various institutional sources. I am concerned about faculty retention in the future unless these issues can be worked out in a way that is fair to the department.

**TEACHING PROGRAMS**  
**Vijay M. Rao, M.D.**  
**Vice-Chair for Education**

**INTRODUCTION**

One of the major strengths of our department lies in the well-designed and viable teaching programs at all levels of graduate education. Our residency is recognized nationally as one of the best training programs. Our fellowship programs are also very desirable. We continue to successfully compete with the top programs in the country for the best residency applicants as well as fellowship applicants. However, in the current environment, it is becoming increasingly challenging to maintain high quality teaching programs. Faculty are finding themselves in a time bind and the morale is volatile. Increasing clinical responsibilities are eroding into the time that was previously available for teaching and research activities. At the present time, there is a workforce crisis in radiology due to a severe shortage of radiologists nationally. Despite all this, our faculty remained committed to the education of medical students, residents and fellows and deserve to be commended. Our continued success in the future depends largely on our ability to retain high caliber faculty.

**RESIDENCY TRAINING PROGRAM**

The primary goal of our residency program is to produce radiologists who are well trained in all aspects of diagnostic imaging so that they will feel comfortable in either an academic setting or a private practice environment. It gives me great pleasure to report that each of our six senior residents passed the written and oral portions of the American Board of Radiology examination. Our residency program has set a record that is hard to beat. All of our resident graduates have been accepted into top notch fellowship programs. This is a testimony to the excellence of our training programs. Two of the six graduating residents chose to stay with us for fellowships; one in combined body/neuro MRI, and one in cross-sectional imaging. The remaining four residents went for fellowship training to other premier institutions; Brigham and Women's Hospital for neuroradiology, Hospital of the University of Pennsylvania for CVIR and breast imaging, and Yale Medical Center for women's imaging.

**Resident Selection:** This year we received 520 applications for six positions and interviewed 70 applicants. The results of the residency match program (NRMP) once again proved that our residency program is recognized nationally as one of the best training programs. We filled all of our positions with choice candidates. Residency selection is time consuming and an arduous process. Thanks go to Levon Nazarian, M.D., Chairman of the Residency Selection Committee, for this outstanding performance.

**Resident Complement:** Having received the approval for an additional residency position from the hospital administration as well as the RRC for radiology, we successfully recruited a seventh top notch candidate to begin residency training effective July 2001. We hope that our request to increase the resident complement to 28, phased in over the next three years, will be considered favorably by the hospital administration.

**Resident Research:** Research by residents is actively encouraged. In fact, residents are required to complete at least one project by the end of the third year. It is gratifying to note that our residents presented several scientific papers at national radiology meetings this year. The Radiological Society of North America again sponsored the resident/fellow Roentgen Research Award program and invited academic departments to nominate a candidate who had demonstrated accomplishments in radiological



investigation. Sandip Basak, M.D. was the recipient of the 2000 Roentgen Research Award for our department. I would also like to congratulate Steve Wagner, M.D. for unusually strong research productivity during his first year of residency training.

**Clinical Training:** Our clinical practice continues to grow, and this provides a wealth of interesting case material for resident/fellow education. Over the past few years, teleradiology/PACS has been phased into our clinical practice for MRI and CT image interpretation and is currently being expanded to include US interpretation. We are fortunate to be at the forefront of such advances but the teaching program has been somewhat adversely affected. Our ability to utilize the electronic files efficiently for teaching purposes is severely limited. I am pleased to report that the long overdue classroom renovations are scheduled to begin in Summer 2001. The newly designed classroom will have the capability for digital projection and also provide for direct interfacing with the PACS.

Rotations at the Academy Imaging Center continue to be received favorably by the third and fourth year residents. They have gained exposure to the world of private practice while participating in conventional radiography, mammography, and ultrasound at this center. The computed tomography and MRI studies are read at Jefferson itself via teleradiology. The total time spent at the A.I. duPont Institute during residency training increased to 2 months per resident to enhance the educational experience in pediatric radiology.

**ACGME Site Visit.** The regularly scheduled ACGME site visit in April 2001 was completed uneventfully. Our residency program, as well as the neuroradiology and vascular/interventional radiology fellowship programs, were reviewed by the RRC field representative. This was the third site visit under my tenure as the residency program director for the past 16 years. I am confident that we will once again be granted full accreditation status without any citations. We await the official notification in October 2001.

**Excellence in Teaching Award:** The teaching efforts of our faculty are recognized and rewarded each year. The A. Edward O'Hara Award is given each year by the residents to a faculty teacher of the year, and this year David Karasick, M.D. was the recipient.

### TRAINING PROGRAM 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, combined body and neuro/head and neck MRI, US/CT/MRI and musculoskeletal radiology. All of the above programs received very positive year-end critiques from the graduating fellows.

Our neuroradiology/ENT radiology fellowship program has gone through tumultuous times in the past few years due to a paucity of diagnostic neuroangiography cases and conflicts with the endovascular/neurointerventional neurosurgical service. This fellowship got downsized from a total of six to three positions by attrition. However, this year, a national match program analogous to the residency NRMP was instituted nationally for neuroradiology fellowship programs. We filled all of the three positions with choice candidates despite the fact that less than half of the programs filled nationally. This is clearly an accolade for the neuroradiology division under the leadership of David Friedman, M.D.

The breast imaging fellowship under the direction of Cathy Piccoli, M.D., has been redesigned to incorporate ultrasound and MRI of the pelvis and breast, since there is an increasing interest in women's imaging. Our cross-sectional imaging fellowship, under the direction of Barry B. Goldberg, M.D., continues to be in great demand. The vascular and interventional fellowship, under the direction of

Joseph Bonn, M.D., is an accredited program and remains very popular. The combined body and neuro MRI fellowship, under the direction of Donald Mitchell, M.D., is a unique fellowship program, which allows the fellows to gain experience in MR imaging from head to toe. The musculoskeletal fellowship program, under the direction of David Karasick, M.D. and Mark Schweitzer, M.D., was recently expanded and is in much demand.

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, although it took me several years to convince the Jefferson Medical College Curriculum Committee. I wish to thank the core group of enthusiastic faculty members who willingly contribute their time to this important teaching exercise for Jefferson medical students. This group consists of David Eschelman, M.D., William Morrison, M.D., Cathy Piccoli, M.D., Wally Miller, M.D., Lisa Tartaglino, M.D., and Terri Tuckman, M.D. Dr. Tuckman served as the coordinator of this course for this year and has done a fine job.

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, neuroradiology/ENT radiology, CVIR, and Ultrasound/CT/MRI. The radiology electives remain quite popular and were completed by 147 members (62%) 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 12 students in attendance this year.

Wallace Miller, Jr., M.D., joined us from the Hospital of the University of Pennsylvania and served as the coordinator of the general radiology core elective course last year. Dr. Miller is a highly regarded educator and ran a very well organized educational course for medical students. Unfortunately, Dr. Miller will be returning to the Hospital of the University of Pennsylvania in January 2002. I wish to thank him for his contribution to the medical student educational program.

The neuroradiology elective was completed by 4 senior medical students. Electives in Cross-Sectional Imaging and CVIR were completed by 6 and 3 students respectively. All of these courses received rave reviews from the students. I wish to thank all the course coordinators for a fine job – David Friedman, M.D. for neuroradiology, Rick Feld, M.D. for Cross-Sectional Imaging and David Eschelman, 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 General Radiology: A variety of courses were offered by the division of general radiology, which were all well received. The Jefferson Spine Imaging Symposium, directed by John Carrino, M.D. and William Morrison, M.D., was held in September 2000 with 107 attendees; The Jefferson Upper Extremity Advanced Imaging Symposium was directed by Mark Schweitzer, M.D. and David Karasick, M.D. in March 2001 with 133 attendees; as well as the Jefferson Lower Extremity Advanced Imaging Symposium in May 2001 with 135 attendees.

Division of MRI: The Jefferson Abdominal MRI Symposium, directed by Donald Mitchell, M.D. and George Holland, M.D., was held in May 2001 with 57 attendees and received favorable reviews.

14th Annual Philip J. Hodes Lecture. In honor of Philip J. Hodes, M.D., the Fourteenth Annual Philip J. Hodes lecture was very successful. The guest speaker was Charles B. Higgins, M.D, Professor of Radiology, University of California, San Francisco. He gave an outstanding presentation titled "The Emergence of Cardiovascular MRI. Diagnostic Efficiency of a Single Noninvasive Test"

Radiology Grand Rounds. Grand Rounds in Radiology were held bi-weekly and included 17 topics of interest covering all radiology subspecialties.

Radiology Research Conferences. The bi-weekly Radiology Research Conferences were continued this year under the direction of Barry B. Goldberg, M.D. This conference allows the faculty, residents, and fellows in the department the opportunity to present the results of their research activities.

The Jefferson Ultrasound Research and Education Institute (JUREI). The Jefferson Ultrasound Research and Education Institute (JUREI), under the leadership of Barry B. Goldberg, M.D., continues to expand its educational efforts at Jefferson by offering a wide range of courses on ultrasound. The Division of Ultrasound offered more than 45 courses in the past year. The newest courses offered include 3-D ultrasound imaging, musculoskeletal ultrasound, sonomammography, and interventional ultrasound. We continue to offer basic ultrasound programs in abdomen, obstetrics and gynecology, echocardiography and Doppler ultrasound.

In addition, the 21<sup>st</sup> annual Leading Edge in Diagnostic Ultrasound Conference in Atlantic City was a major success, with over 1300 attendees. There were multiple simultaneous courses including programs on Doppler ultrasound, obstetrics and gynecology 3D imaging, musculoskeletal imaging, sonomammography, a symposium on ultrasound contrast agents, and an introductory course on ultrasound physics. A wide variety of ultrasound equipment was on display, and the booth space was completely sold out.

Support from ultrasound manufacturers and foundations has enabled our affiliate ultrasound education programs around the world to expand. The Soros Foundation (Open Society Institute) continues to support our program for international training and the production of educational materials for our affiliate sites. There are now forty-five affiliated programs throughout Europe, South America, Asia and Africa.

A grant was recently awarded by the Research and Education Fund of the Radiological Society of North America to develop six affiliated education centers in sub-Saharan Africa. The program will result in the training of physicians from countries in Africa, who will return to their countries to develop ultrasound training centers. JUREI will support these centers by supplying educational materials, teaching manuals and specially developed examinations. These centers will be linked to JUREI and each other through the internet. Thus, JUREI continues to raise the level of knowledge and the standards of ultrasound imaging throughout the world.

## FUTURE GOALS

Our future goals of preserving high quality educational programs for medical students, residents and fellows can be met only if the morale of faculty stays upbeat. It is important that we maintain a critical mass of faculty and the infrastructure to continue to excel in patient care, teaching and research. Additionally, we need to have access to resources to purchase or update equipment and other teaching materials as needed in order to stay on the cutting edge. Such measures are necessary if we are to continue to attract the best candidates for residency and fellowship programs in the future.

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278. Shi WT: Ultrasound contrast agents and nonlinear imaging. *Proceedings of IEEE-EMBS Asia-Pacific Conference on Biomedical Engineering*, Hongzhou, China, September 2000.
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## FORMAL SCIENTIFIC PRESENTATIONS

### JOSEPH BONN, M.D.

- October 7, 2000
- 8<sup>th</sup> Annual Interventional Radiology and Vascular Imaging 2000, University of Pennsylvania Medical Center, Philadelphia, PA
- "CO2 venography and cavography"
  - "Vena cava filters: Unsolved mysteries"

### JOHN A. CARRINO, M.D.

- September 23-24, 2000
- Jefferson Spine Imaging Symposium, Jefferson Medical College, Philadelphia, PA
- "Nomenclature of disc disease"
  - "Advanced imaging of spine disease and facet arthropathy"
  - "Advanced image guided spine procedures"
- October 12-14, 2000
- Society for Health Services Research in Radiology 2000 Annual Meeting, Washington, DC
- "Image information management: Impact on workflow and productivity"
- November 26-  
December 1, 2000
- 86<sup>th</sup> Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- "PACS and IS integration: Issues, strategies and trends" (refresher course)
  - "MR imaging of the post operative knee: Cruciate ligaments" (refresher course)
- February 24-27, 2001
- 5<sup>th</sup> Annual CR & PACS: An Educational Forum, Fuji Medical Systems, Savannah, GA
- "Image quality issues in PACS" (update)
- March 10-11, 2001
- 5<sup>th</sup> Annual Jefferson Upper Extremity Imaging Symposium, Jefferson Medical College, Philadelphia, PA
- "MR imaging of shoulder impingement"
  - "MR imaging of the wrist: Flexors, extensors and carpal tunnel"
- March 15-17, 2001
- The Internet: The Road to Smart Nuclear Medicine, presented jointly by Johns Hopkins Medicine, the Society of Nuclear Medicine, the Office of High Performance Computing and Communications at the National Library of Medicine and the National Institutes of Health, Bethesda, MD
- "DICOM for dummies"
- April 21-27, 2001
- The 9<sup>th</sup> Scientific Meeting and Exhibition of the International Society Magnetic Resonance in Medicine-ESMRMB, Joint Annual Meeting, Glasgow Scotland
- "MR of marrow - miscellaneous" (clinical categorical course)
- May 3-6, 2001
- 18<sup>th</sup> Symposium for Computer Applications in Radiology, Salt Lake City, UT
- "Clinical perspectives in teleradiology" (SCAR university)
  - "Image quality: Overview" (special session)



- May 10-12, 2001      Emergency Radiology: Pearls and Perils, Brigham and Women's Hospital, Harvard Medical School Course, Pinehurst, NC
- "Musculoskeletal imaging"
- May 19-20, 2001      6<sup>th</sup> Annual Jefferson Lower Extremity Advanced Imaging Symposium, Jefferson Medical College, Philadelphia, PA
- "MR imaging of knee menisci"
  - "Post operative knee imaging"
- June 3-7, 2001      Radiology Management in a New Era, Continuing Education Course, Harvard Medical School, Boston, MA
- "PACS"
  - "Use of technology to improve workflow"

**W. SCOTT ENOCHS, M.D., PH.D.**

- May 18, 2001      Neurology Review Course, The Osler Institute, Philadelphia, PA
- "Pediatric neuroradiology"
  - "Aging brain and neurodegenerative diseases"

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

- October 6-7, 2000      The Radiological Society of New Jersey, Eatontown, NJ
- "Practical abdominal ultrasound"
  - "Ultrasound guided biopsies, aspirations and drainages"
  - "Ultrasound of the scrotum"
  - "Sonography of adnexal abnormalities"
- October 15, 2000      Mount Sinai 2000 Update, New York, NY
- "Ultrasound guided treatment of groin injuries: Compression repair versus thrombin injection"
  - "Ultrasound guided thermal and cryoablation of focal tumors"
- November 26-  
December 1, 2000      86<sup>th</sup> Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- "Dramatic increase in ultrasound guided interventional procedure volume"
- March 11-14, 2001      45<sup>th</sup> Annual Convention of the American Institute of Ultrasound in Medicine, Orlando, FL
- "Ultrasound-guided biopsy of thyroid nodules, superficial nodules and other small masses" (categorical course)
  - "Ultrasound-guided abdominal biopsies"
- March 16, 2001      Pennsylvania Society of Colorectal Surgery, Philadelphia, PA
- "Intraoperative liver sonography"
- March 26, 2001      Monmouth Medical Center, Long Branch, NJ
- "Ultrasound in the evaluation of emergency conditions"

## ADAM E. FLANDERS, M.D

- November 26-  
December 1, 2000 86<sup>th</sup> Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- "How to make an electronic presentation" (refresher courses)
  - "Working the Web" (refresher courses)
- February 27-  
March 4, 2001 The 68<sup>th</sup> Annual Meeting of the American Academy of Orthopedic Surgery, San Francisco, CA
- "Imaging strategies in thoracolumbar trauma"
- May 25, 2001 Department of Neuroradiology Grand Rounds, Northwestern University Medical Center, Chicago, IL
- "MR advances in spinal cord injury"

## FLEMMING FORSBERG, PH.D.

- July 26, 2000 Advanced Logiq 700 Technology, GE Medical Systems, Milwaukee, WI
- "Detection directions... A historic look at the future"
- August 13-14, 2000 GE Medical Systems, Sydney, Australia
- "Detection directions... A historic look at the future" (workshop)
  - "A study in contrasts: Current state of ultrasound contrast imaging"
- August 16-17, 2000 GE Medical Systems, Brisbane, Australia
- "Detection directions... A historic look at the future" (workshop)
  - "A study in contrasts: Current state of ultrasound contrast imaging"
- August 20, 2000 GE Medical Systems, Melbourne, Australia
- "Detection directions... A historic look at the future" (workshop)
- August 23, 2000 GE Medical Systems, Auckland, New Zealand
- "A study in contrasts: Current state of ultrasound contrast imaging" (workshop)
- September 22, 2000 Advanced Logiq 700 Technology, GE Medical Systems, Milwaukee, WI
- "A study in contrasts: Current state of ultrasound contrast imaging"
- September 28, 2000 Rochester Center for Biomedical Ultrasound, Rochester, NY
- "Bubble destruction and nonlinear imaging techniques"
- September 28, 2000 Department of Radiology Grand Rounds, University of Rochester/Strong Memorial Hospital, Rochester, NY
- "Advances in ultrasound contrast imaging"
- October 16, 2000 School of Biomedical Engineering and Health Sciences, Drexel University, Philadelphia, PA
- "Clinical applications of ultrasound contrast agents"
- October 18, 2000 Advanced Logiq 700 Technology, GE Medical Systems, Milwaukee, WI
- "A study in contrasts: Current state of ultrasound contrast imaging"

- October 27–29, 2000      10<sup>th</sup> Annual Meeting of the Society of Radiologists in Ultrasound, Washington, DC
- “Physics of contrast agents and beyond”
- November 3, 2000      Advanced Logiq 700 Technology, GE Medical Systems, Milwaukee, WI
- “A study in contrasts: Current state of ultrasound contrast imaging”
- November 15, 2000      Rochester Ultrasound Society, Rochester Institute of Technology, Rochester, NY
- “Advances in ultrasound contrast imaging”
- November 26-  
December 1, 2000      86<sup>th</sup> Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- “Principles of Doppler imaging”
  - “Phase inversion US contrast imaging of prostate tumors”
  - “The mechanical index: An unsuitable and inappropriate parameter for describing contrast microbubble destruction”
  - “Physics of contrast agents and beyond”
- December 7, 2000      In Vivo Cellular and Molecular Imaging Center Retreat, University of Pennsylvania, Philadelphia, PA
- “Ultrasound imaging of tumors”
- December 13, 2000      Advanced Logiq 700 Technology, GE Medical Systems, Milwaukee, WI
- “Advances in ultrasound contrast imaging”
- January 26-27, 2001      International 3D Ultrasound Congress, sponsored by Thomas Jefferson University Hospital, Miami Beach, FL
- “Principles of vascular 3-D imaging”
- February 2-3, 2001      6<sup>th</sup> Ultrasound Contrast Research Symposium, Department of Radiology, University of California, San Diego, CA
- “Contrast enhanced ultrasound correlates with molecular markers of angiogenesis in a human melanoma xenograft model”
- February 23, 2001      Advanced Logiq 700 Technology, GE Medical Systems, Milwaukee, WI
- “Advances in ultrasound contrast imaging”
- March 11-14, 2001      45<sup>th</sup> Annual Convention of the American Institute of Ultrasound in Medicine, Orlando, FL
- “Does the mechanical index predict destruction rates for contrast microbubbles?”
  - “Nonlinear imaging”
  - “Comparison of contrast enhanced ultrasound to immunohistochemical predictors of angiogenesis in a human xenograft model”
  - “Subharmonic imaging with AI-700”
- March 22, 2001      Advanced Logiq 700 Technology, GE Medical Systems, Milwaukee, WI
- “Advances in ultrasound contrast imaging”
- April 4, 2001      Thomas Jefferson University, Department of Medicine, Philadelphia, PA
- “Ultrasound imaging of Angiostatin patients”

- April 12, 2001 Merck Research Laboratories, West Point, PA
- "Ultrasound imaging of angiogenesis and anti-angiogenesis"
- April 27, 2001 Advanced Logiq 700 Technology, GE Medical Systems, Milwaukee, WI
- "Advances in ultrasound contrast imaging"
- May 8-11, 2001 The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
- "Contrast imaging of angiogenesis"
- May 14, 2001 Nomos Corporation, Pittsburgh, PA
- "Advances in ultrasound imaging"
- June 15-17, 2001 Ultrasound Symposium, University of Innsbruck, Innsbruck, Austria
- "Introduction to ultrasound contrast agents"
  - "Breast tumor neovascularity detected with contrast and pathology"
  - "Ultrasound contrast agents in melanoma: Experience in mice"

### **DAVID P. FRIEDMAN, M.D**

- April 23-27, 2001 The 39<sup>th</sup> Annual Meeting of the American Society of Neuroradiology, Boston, MA
- "The state of fellowship training in neuroradiology in the United States"
  - "Post-treatment MR imaging abnormalities in patients with trigeminal neuralgia and multiple sclerosis undergoing stereotactic radiosurgery using the gamma knife"

### **BARRY B. GOLDBERG, MD**

- August 26, 2000 Radiological Society of North America Consensus Conference, Oak Brook, IL
- "Centers of excellence in education"
- September 7, 2000 20<sup>th</sup> Interamerican Congress of Radiology, Buenos Aires, Argentina
- "Three-Dimensional ultrasound imaging"
  - "Advances in ultrasound contrast agents"
- October 22, 2000 Agilent Technologies Teleconference, Beijing, China
- "Ultrasound contrast imaging"
  - "Review of ultrasound education"
- October 23, 2000 Fourth Military Medical University, Xian, China
- "International ultrasound education program"
- October 28, 2000 2<sup>nd</sup> International Kyoto Symposium on Ultrasound Contrast Imaging, Kyoto, Japan
- "Diagnosis of neoplastic disease"

- November 10, 2000 American Institute of Ultrasound in Medicine Millennium Course, Diagnostic Ultrasound in the 21<sup>st</sup> Century, New York, NY
- “Advances in gynecologic ultrasound”
  - “Ultrasound contrast agents: Potential usefulness in women’s imaging”
- November 26-December 1, 2000 86<sup>th</sup> Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- “Teaching the teachers” (exhibit)
  - “The role of contrast-enhanced US for RF ablation of liver tumor”
  - “The use of ultrasound in tuberculosis”
  - “Detection of abdominal bleeding by contrast-enhanced 2-D and 3-D ultrasound”
- January 22-23, 2001 Giornate Fiorentine di Angiologia, Florence, Italy
- “Seconda armonica ecocontrasto e pulse inversion, eco 3d nella diagnostica vascolare”
- January 26-27, 2001 International 3D Ultrasound Congress, sponsored by Thomas Jefferson University Hospital, Miami Beach, FL
- “Three-Dimensional ultrasound vascular imaging”
- February 10, 2001 Innovative Solutions for Prostate Cancer Care Conference, San Luis Obispo, CA
- “Advanced ultrasound for prostate cancer detection and characterization”
- February 15, 2001 Radiologic Society of New Jersey, New Brunswick, NJ
- “New horizons in ultrasound”
- March 11-14, 2001 45<sup>th</sup> Annual Convention of the American Institute of Ultrasound in Medicine, Orlando, FL
- “Contrast enhanced ultrasound and mammography for breast cancer detection”
  - “Governmental and other influences on ultrasound”
- April 18, 2001 Coombe Women’s Hospital, Dublin, Ireland
- “Advances in ob/gyn ultrasound”
- April 20, 2001 Medical Ultrasound 2001, Bristol, United Kingdom
- “The future”
- May 7, 2001 The 7<sup>th</sup> Annual International Symposium on Contrast Agent in Diagnostic Ultrasound, Atlantic City, NJ
- “Use of diagnostic ultrasound in guiding and monitoring interventional therapeutic procedures”
- May 8-11, 2001 The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
- “Breast contrast ultrasound imaging”

### **ETHAN J. HALPERN, M.D.**

- October 18, 2000 58<sup>th</sup> Annual Meeting of the Mid-Atlantic Section, American Urological Association, Rio Grande, Puerto Rico
- “Improved detection of prostate cancer with contrast-enhanced sonography using Definity”
- October 24, 2000 Second Symposium on Ultrasound Contrast Radiological Diagnosis: Bubbles in Radiology, The State of the Art, Toronto, Canada.
- “Microbubble-enhanced sonography of prostate cancer”
- November 26-  
December 1, 2000 86<sup>th</sup> Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- “Depiction of aortic stent graft complications”
  - “The A,B,C's of ROC Analysis”
- March 11-14, 2001 45<sup>th</sup> Annual Convention of the American Institute of Ultrasound in Medicine, Orlando, FL
- “Doppler imaging of the genitourinary system: Color and power Doppler sonography of the prostate”
  - “Contrast-enhanced sonography of the prostate with Sonazoid: Correlation with whole-mount prostatectomy specimens”
  - “Detection of prostate cancer with contrast-enhanced sonography: Correlation with Gleason score”
- May 8-11, 2001 The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
- “Prostate cancer detection using Definity”

### **GEORGE A. HOLLAND, M.D.**

- October 21-22, 2000 Frankford Hospital Abdominal Radiology Gastroenterology Course, Poconos, PA
- “Recent advances in abdominal radiology”
- April 21-27, 2001 The 9<sup>th</sup> Scientific Meeting and Exhibition of the International Society Magnetic Resonance in Medicine-ESMRMB, Joint Annual Meeting, Glasgow Scotland
- “The normal adrenal cortex: In-vitro high resolution chemical shift MR imaging, with histologic correlation” (poster)
- April 29-  
May 4, 2001 101<sup>st</sup> Annual Meeting of the American Roentgen Ray Society, Seattle, WA
- “Peripancreatic neoplasms: Diagnosis and staging by MR and endoscopic ultrasonography (EUS)”

### **CHARLES M. INTENZO, M.D.**

- November 1, 2000 Thyroid Interdisciplinary Conference, Thomas Jefferson University, Philadelphia, PA
- “High dose radioiodine ablation in metastatic well-differentiated thyroid cancer”

- November 26-  
December 1, 2000
- 86<sup>th</sup> Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- “The relative role of radiologists and non-radiologists in cardiac nuclear imaging: Comparison between 1996 and 1998 using a nationwide Medicare database”
  - “Variation in the practice patterns of cardiac nuclear imaging in different geographic regions of the USA”
  - “Use and abuse of lung scintigraphy by emergency room physicians: A five-year trend”
  - “Is I-131 whole-body imaging prior to radioiodine ablation in stages I and II well-differentiated thyroid cancer really necessary?”
  - “Everything you always wanted to know about performing pediatric brain SPECT but were afraid to do: A step-by-step technical pictorial guide and clinical cases”
  - “Reflex sympathetic dystrophy: A pictorial review of scintigraphic findings, stages, and clinical manifestations”
  - “Subclinical hyperthyroidism: Scintigraphic findings and its evolution into clinical hyperthyroidism – A pictorial essay”
- December 8, 2000
- Division of Endocrinology Endocrine Forum, Thomas Jefferson University, Philadelphia, PA
- “Subclinical hyperthyroidism”
- April 27, 2001
- Division of Endocrinology Endocrine Forum, Thomas Jefferson University, Philadelphia, PA
- “Scintigraphic patterns of autoimmune thyroiditis”
- May 9, 2001
- Surgical Interdisciplinary Conference, Thomas Jefferson University, Philadelphia, PA
- “Utilization of SPECT in localization of parathyroid adenomas”

### **DAVID KARASICK, M.D.**

- March 10-11, 2001
- 5<sup>th</sup> Annual Jefferson Upper Extremity Imaging Symposium, Jefferson Medical College, Philadelphia, PA
- “Radiologic evaluation of the painful shoulder”
  - “Imaging of the acutely traumatized shoulder”
  - “CT of wrist trauma”
- April 1-5, 2001
- Skeletal Radiology 2001, Scottsdale, AZ
- “Imaging of the traumatized rigid spine”
  - “Imaging of the rheumatoid spine”
  - “Imaging of complications of spinal fusion”
  - “Imaging of spinal tumors”
- April 26, 2001
- Tumor Board Review, Bryn Mawr Hospital, Bryn Mawr, PA
- “Bone tumors”
- May 19-20, 2001
- 6<sup>th</sup> Annual Jefferson Lower Extremity Advanced Imaging Symposium, Jefferson Medical College, Philadelphia, PA
- “MR/CT foot and ankle tumors”
  - “CT of ankle”

## STEPHEN KARASICK, M.D.

March 25-29, 2001

Abdominal Radiology Postgraduate Course 2001, Scottsdale, AZ

- "Cystodefecography: An effective tool for delineating pelvic floor weakness" (poster)
- "Hysterosalpingography: Basic to bizarre" (workshop)
- "Defecography-importance of small bowel and vaginal opacification" (workshop)

## SUNG M. KIM, M.D.

November 26-

December 1, 2000

86<sup>th</sup> Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL

- "Functional evaluation of Sjogren's syndrome with salivary scintigraphy: Correlation with histopathologic grading"
- "Brain perfusion SPECT evaluation of complex regional pain syndrome (type I): Reflex sympathetic dystrophy syndrome"

## ALFRED B. KURTZ, M.D.

September 23, 2000

Ultrasound Update 2000, UC Davis Health System, Department of Radiology and Continuing Medical Education, Sacramento, CA

- "Obstetrical measurement parameters as outlined by the AIUM/ACR standards"
- "The fetal central nervous system"
- "Ultrasound and Doppler evaluation of ectopic pregnancy"

October 28, 2000

10<sup>th</sup> Annual Meeting and Postgraduate Educational Course of the Society of Radiologists in Ultrasound, Women's Imaging Minicourse, Washington, DC

- "Multimodality approach to ovarian cancer"

March 29, 2001

Bryn Mawr Hospital, Department of Radiology, Bryn Mawr, PA

- Case presentation (visiting professor)

April 12-13, 2001

Jornada Paulista De Radiologia-JPR 2001, Sao Paulo, Brazil

- "Ectopic pregnancies, ultrasound and Doppler analysis"
- "2<sup>nd</sup> and 3<sup>rd</sup> trimester obstetrical emergencies"
- "How to evaluate fetal age and growth"
- "Fetal central nervous system"
- "Detection of ovarian cancer - with comparison to CT and MR"
- "Understanding ultrasound echogenicity"

May 2, 2001

Albert Einstein Medical Center, Department of Radiology, Philadelphia, PA

- Resident film review (visiting professor)
- "Sonography of second and third trimester obstetrical emergencies"

May 8, 2001

Philadelphia Roentgen Ray Society, Oration in Honor of Barry B. Goldberg, Outstanding Educator Award-2001, Philadelphia, PA

- "The wonderful world of ultrasound"



- May 8-11, 2001                      The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ (Co-Director)
- “The fetal GI system”
- DAVID C. LEVIN M.D.**
- September 23, 2000                      Society of Chairmen of Academic Radiology Departments, New York, NY
- “Monitoring managed care agreements”
- September 28, 2000                      Yale University School of Medicine, New Haven, CT
- “Coronary artery anatomy and pathophysiology – Prepare yourself for the upcoming era of MR coronary angiography”
  - “Self-referral and encroachment by other medical specialists – How should radiologists respond to these challenges?”
- October 18, 2000                      Philadelphia Board Review Course in Cardiovascular Diseases, Philadelphia, PA
- “Radiology: X-ray and CT of the heart”
- October 26-29, 2000                      Economics in Diagnostic Imaging 2000: National Symposium, Arlington, VA
- “Turf battles in radiology”
  - “Utilization of diagnostic imaging under managed care: What do the data show?”
  - “How to plan and negotiate a capitated radiology contract”
  - “Management challenges facing academic radiology departments and how to meet them”
  - “Pressing imperatives for radiology over the next five years”
- November 26-  
December 1, 2000                      86<sup>th</sup> Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- “Comparison of nationwide growth rates in echocardiography and other types of ultrasound between 1996 and 1998”
  - “Increases in utilization rates of radionuclide myocardial perfusion imaging are far higher among patients studied by cardiologists than among those referred to radiologists: Nationwide Medicare data for 1996 and 1998” (hot topic presentation)
  - “Cardiac imaging with CT, MR, and nuclear radiology: Practice and training issues”
  - “Comparison of utilization of add-on radionuclide cardiac wall motion and ejection fraction studies by radiologists and cardiologists in 1996 and 1998” (poster)
  - “Negotiating a managed care contract”
  - “Challenges to Radiology in the new millennium: Turf issues and how to cope with them”
- March 4-8, 2001                      26<sup>th</sup> Annual Scientific Meeting of the Society of Cardiovascular and Interventional Radiology, San Antonio, TX
- “Overview of cardiac catheterization”
  - “Basics of coronary arteriography”

- April 3, 2001 Fu Wai Cardiovascular Institute and the Chinese Academy of the Medical Sciences, Beijing, China
- “What’s wrong with American medicine?”
  - “Growth rates in cardiovascular imaging among radiologists and cardiologists”
- April 4, 2001 Peking Union Medical College Hospital, Beijing, China
- “Cardiovascular imaging – How important a part of radiology is it?”
- May 1-2, 2001 State University of New York Health Sciences Center, Stony Brook, NY
- “Plain film analysis of adult heart disease”
  - “The future of radiology”
  - “Aortic arch abnormalities”
- June 3-7, 2001 Radiology Management in a New Era, Continuing Education Course, Harvard Medical School, Boston, MA
- “Developing a strategic plan and position for your practice”
  - “Competitive strategy development – academic”

**ANNA S. LEV-TOAFF, M.D.**

- September 8-10, 2000 Annual Pacific Northwest Diagnostic Ultrasound Symposium, Seattle, WA
- “Three-dimensional ultrasound”
  - “Oral contrast for abdominal ultrasound”
  - “Sonohysterography”
- September 20, 2000 Newark Beth Israel Medical Center Grand Rounds, Newark, NJ
- “Sonohysterography”
- November 8, 2000 University of Connecticut Health Center School of Medicine Grand Rounds, Farmington, CT
- “Sonohysterography”
  - “GI radiology review”
- January 26-27, 2001 International 3D Ultrasound Congress, sponsored by Thomas Jefferson University Hospital, Miami Beach, FL
- “Live demonstration of 3-D transvaginal ultrasound and cases”
  - “3-D ultrasound of the uterus and 3-D sonohysterography”
- March 11-14, 2001 45<sup>th</sup> Annual Convention of the American Institute of Ultrasound in Medicine, Orlando, FL
- “3D case studies in obstetrics and gynecology”
  - “Clinical applications of 3D imaging in gynecology”
- April 25, 2001 Diagnostic Radiology Residency Program Grand Rounds, Christiana Care Health System, Newark, DE
- “Sonohysterography”
- May 8-11, 2001 The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
- “Sonohysterography - 2D and 3D”

- June 21-23, 2001 3<sup>rd</sup> Ultrasonography Congress of JUREI Argentina (The Leading Edge Latin America), Rosario, Argentina
- “Ultrasound evaluation of uterine malformations”
  - “Sonohysterography”
  - “3D ultrasound in gynecology”
  - “3D ultrasound in obstetrics”

### **JI-BIN LIU, M.D.**

- October 22, 2000 Agilent Technologies Teleconference, Beijing, China
- “Ultrasound-guided radiofrequency ablation of liver tumors”
- November 26-  
December 1, 2000 86<sup>th</sup> Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- “US-guided radiofrequency ablation: laboratory and clinical experiences” (exhibit)
- January 26-27, 2001 International 3D Ultrasound Congress, sponsored by Thomas Jefferson University Hospital, Miami Beach, FL
- “Endoluminal 3-D ultrasound: Non-vascular and vascular”
- March 11-14, 2001 45<sup>th</sup> Annual Convention of American Institute of Ultrasound in Medicine, Orlando, FL
- “Transureteral sonography: Experiences with a reusable miniature ultrasound catheter” (exhibit)
- April 4, 2001 Peking Union Medical College Hospital, Beijing, China
- “Ultrasound-guided radiofrequency ablation of liver tumors”
  - “Interventional ultrasound”
- May 18-20, 2001 86<sup>th</sup> Annual Meeting of The Pennsylvania Radiological Society Hershey, PA
- “US-guided radiofrequency ablation: Laboratory and clinical experiences”

### **ANDREW D. MAIDMENT, PH.D.**

- July 25, 2000 42<sup>nd</sup> Annual Meeting of the American Association of Physicists in Medicine, Chicago, IL
- “Automated 3-D limited-view binary reconstruction of breast calcifications”
  - “Generation and evaluation of physically inspired synthetic mammograms”
- November 11, 2000 Annual Fall Seminar, Philadelphia Society of Radological Technologists Meeting, Philadelphia, PA
- “Digital mammography”
- May 3-6, 2001 18<sup>th</sup> Symposium for Computer Applications in Radiology, Salt Lake City, UT
- “CR and DR: Cost efficacy”
  - “The physical basis and properties of digital radiography modalities”

## CHRISTOPHER R.B. MERRITT, M.D.

- August 10-13, 2000      20<sup>th</sup> Annual Pittsburgh Breast Imaging Seminar, Pittsburgh, PA
- “Breast ultrasound: Optimizing technique”
  - “Using the ultrasound lexicon: Case studies”
  - “New developments in breast ultrasound”
- September 11-14, 2000      1<sup>st</sup> International Ultrasound Symposium, sponsored by Gazi University School of Medicine Department of Radiology and Thomas Jefferson University Hospital, Istanbul, Turkey
- “Carotid and vertebral ultrasound”
  - “Breast ultrasound”
  - “Basics of ultrasound”
  - “Abdominal Doppler”
  - “New developments in ultrasound”
  - “Contrast agents in ultrasound”
- October 13, 2000      Danish US Society, Copenhagen, Denmark
- “New developments in breast ultrasound”
- October 27-29, 2000      10<sup>th</sup> Annual Meeting of the Society of Radiologists in Ultrasound, Washington, DC
- “Presenting with power point” (meet the professor)
  - “New directions in breast ultrasound”
- November 13-14, 2000      University of New Mexico, Albuquerque, New Mexico
- “New Developments in Breast Ultrasound” (visiting professor)
  - “Cerebrovascular ultrasound”
  - “Ultrasound basics”
- November 26-  
December 1, 2000      86<sup>th</sup> Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- “The breast imaging reporting and data system: Ultrasound. A lexicon for the description of sonographic features of breast pathology”
- March 11-14, 2001      45<sup>th</sup> Annual Convention of the American Institute of Ultrasound in Medicine, Orlando, FL
- “Ultrasound - Back to the basics” (meet the professor )
- April 29-  
May 4, 2001      101<sup>st</sup> Annual Meeting of the American Roentgen Ray Society, Seattle, WA
- “Master lecture series. Doppler principles and applications”
- May 8-11, 2001      The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
- “New directions in breast ultrasound”
  - “Intima medial thickness – evaluation with ultrasound”
  - “BIRADS Lexicon for breast ultrasound”
- May 16-19, 2001      Society of Breast Imaging, San Diego, CA
- “Hands-on ultrasound guided breast biopsy”
  - “Breast ultrasound: Optimizing technique”
  - “ACR breast ultrasound Lexicon workshop” (co-moderator)

- June 15-17, 2001                      Ultrasound Symposium, University of Innsbruck, Innsbruck, Austria
- “Clinical use of SonoRx<sup>®</sup>”
  - “Ultrasound contrast agents for assessment of angiogenesis”
  - “Sonoelastography of the prostate”
- June 21-23, 2001                      3<sup>rd</sup> Ultrasonography Congress of JUREI Argentina (The Leading Edge Latin America), Rosario, Argentina
- “Breast ultrasound - Optimizing technique”
  - “Angiogenesis and antiangiogenesis - the role of ultrasound”
  - “Understanding Doppler: Principles and artifacts”
  - “Carotid ultrasound”

**DONALD G. MITCHELL, M.D.**

- November 26-  
December 1, 2000                      86<sup>th</sup> Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- “Variation in body MRI and CT relative procedure volume: An analysis of a fee-for service health insurance database” (poster)
  - “MR imaging of fetus” (poster)
  - “MR imaging of cyst and cystic lesion of the liver” (poster)
- March 19-22, 2001                      Society of Computed Body Tomography and Magnetic Resonance 24<sup>th</sup> Annual Course, Miami Beach, FL
- “Hepato-biliary imaging”
  - “MRI of diffuse liver disease”
- April 21-27, 2001                      The 9<sup>th</sup> Scientific Meeting and Exhibition of the International Society Magnetic Resonance in Medicine-ESMRMB, Joint Annual Meeting, Glasgow Scotland
- “Advanced body MRI: Techniques for body MRI”
  - “The 30-minute liver MRI”
  - “Cirrhosis: A modified caudate-to-right-lobe ratio” (poster)
  - “Gonadal veins: MR imaging findings in an unselected population” (poster)

**WILLIAM B. MORRISON, M.D.**

- September 23-24, 2000                      Jefferson Spine Imaging Symposium, Jefferson Medical College, Philadelphia, PA
- “Imaging of spine infection and differential diagnosis”
  - “Interventional spine procedures: Nerve blocks, facet injections and biopsy”
  - “Imaging of thoracolumbar spine trauma”
- October 12, 2000                      Christiana Hospital, Department of Radiology, Wilmington, DE
- “Look-alike lesions of the musculoskeletal system”
- November 3-4, 2000                      Annual Maastrich MRI Symposium, Maastricht, The Netherlands
- “MR arthrography”
  - “MRI of the elbow”
  - “MRI of infection of the ankle and foot”
  - “MRI of spine infection”

- November 26-  
December 1, 2000
- 86<sup>th</sup> Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- “Who is performing interventional spine procedures?”
- January 17, 2001
- Fitzgerald Mercy Catholic Medical Center, Department of Radiology, Philadelphia, PA
- “Look-alike lesions of the musculoskeletal system”
- March 10-11, 2001
- 5<sup>th</sup> Annual Jefferson Upper Extremity Imaging Symposium, Jefferson Medical College, Philadelphia, PA
- “MRI of the elbow”
  - “MRI of the acromioclavicular and sternoclavicular joint”
- March 22, 2001
- Bryn Mawr Hospital, Department of Radiology, Bryn Mawr, PA
- “Look-alike lesions of the musculoskeletal system”
- April 1-5, 2001
- 2001 Spring Medical/Surgical Conference, Bad Kissengen, Germany
- “MR arthrography”
  - “MRI of the shoulder”
  - “MRI of the hip”
  - “MRI of the ankle and foot”
  - “MRI of spine infection”
- April 21-27, 2001
- The 9<sup>th</sup> Scientific Meeting and Exhibition of the International Society Magnetic Resonance in Medicine-ESMRMB, Joint Annual Meeting, Glasgow Scotland
- “MR imaging of infection vs. neuropathic disease”
- April 29-  
May 4, 2001
- 101<sup>st</sup> Annual Meeting of the American Roentgen Ray Society, Seattle, WA
- “MR spectrum of distal peroneal symptomatology”
  - “Hindfoot valgus and fibulocalcaneal abutment: Additional secondary MR imaging signs of posterior tibialis tendon dysfunction”
  - “Is spread of foot infection contained by fascial compartments? Analysis of compartmental involvement in 142 MRI examinations”
  - “Incidence and location of abscesses in clinically suspected pedal osteomyelitis – MRI analysis with surgical correlation”
  - “Pedal osteomyelitis: Distribution, patterns of spread and frequency of associated septic arthritis”
- May 10-11, 2001
- University of Pittsburgh Medical Center, Pittsburgh, PA
- “MRI of the shoulder”
  - “MRI of foot infection”
- May 19-20, 2001
- 6<sup>th</sup> Annual Jefferson Lower Extremity Advanced Imaging Symposium, Jefferson Medical College, Philadelphia, PA
- “Basics of MRI”
  - “MRI of the hip and pelvis”
  - “MR arthrography”
  - “MRI of foot/ankle infection vs. neuropathic disease”

## LEVON N. NAZARIAN, M.D.

- September 5, 2000 Tyrolean Ultrasound Society, University of Innsbruck, Innsbruck, Austria
- “Musculoskeletal ultrasound: General applications”
- September 7, 2000 24<sup>th</sup> Official Meeting of the Austrian, German, and Swiss Ultrasound Societies Dreilandertreffen 2000, Vienna, Austria
- “Applications of photopic imaging in the musculoskeletal system”
- October 4, 2000 State Medical University of Armenia, Yerevan, Armenia
- “Recent advances in ultrasound imaging” (visiting professor)
- October 21-22, 2000 3<sup>rd</sup> Annual North American Symposium on Musculoskeletal Ultrasound, Toronto, Ontario, Canada
- “Anatomy and ultrasound of the normal ankle/foot”
  - “Common pathology of the ankle/foot”
  - Hands-on scanning session
- October 31-  
November 1, 2000 Emory University Hospital, Department of Radiology, Atlanta, GA
- “General concepts of musculoskeletal ultrasound” (visiting professor)
  - Resident case presentations
- November 26-  
December 1, 2000 86<sup>th</sup> Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- “CT for acute abdominal pain: Should focused studies be performed?”
- March 11-14, 2001 45<sup>th</sup> Annual Convention of the American Institute of Ultrasound in Medicine, Orlando, FL
- “Adaptive contrast optimization in musculoskeletal sonography: Preliminary experience”
  - “Shoulder sonography” (categorical course)
  - Instructor, Musculoskeletal sonography Hands-on Sessions
- May 8-11, 2001 The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ (Course Director)
- “General concepts of musculoskeletal ultrasound”
  - “Ultrasound of the foot and ankle”
  - “Musculoskeletal soft tissue masses”
  - “Therapeutic ultrasound in musculoskeletal ultrasound”
- May 17, 2001 Bryn Mawr Hospital, Department of Radiology, Bryn Mawr, PA
- Resident Case Presentations (visiting professor)
- May 19-20, 2001 6<sup>th</sup> Annual Jefferson Lower Extremity Advanced imaging Symposium, Philadelphia, PA
- “Ultrasound of the foot/ankle”

**LAURENCE NEEDLEMAN, M.D.**

- August 27, 2000 American Institute of Ultrasound in Medicine Millennium Course, Diagnostic Ultrasound in the 21<sup>st</sup> Century, New York, NY
- "Evaluating the patient with a swollen arm or leg"
  - "The patient with bruit or suspected cerebral ischemia"
  - "Contrast agents in ultrasound diagnosis"
  - Panel discussion
- September 8, 2000 Advanced Seminars Ultrasound Diagnosis, New York, NY
- "Interpretation of spectral and color Doppler"
  - "Interpretation of carotid Doppler"
  - "Interpretation of peripheral arterial disease"
  - "Upper extremity venous disease"
- October 7, 2000 8<sup>th</sup> Annual Interventional Radiology and Vascular Imaging 2000, University of Pennsylvania Medical Center, Philadelphia, PA
- "RF ablation with RITA and Radionics systems"
- October 14, 2000 Mount Sinai 2000 Update, New York, NY
- "Carotid ultrasound"
  - "Overview of ultrasound contrast agents"
- October 27-29, 2000 10<sup>th</sup> Annual Meeting of the Society of Radiologists in Ultrasound, Washington, DC
- "Ultrasound contrast agents: Current status"
- November 16-17, 2000 Advances in Vascular Diagnostics 12<sup>th</sup> Symposium and Workshop on Management and Clinical Issues, sponsored by Montefiore Medical Center, New York, NY
- "Cerebrovascular interpretation"
  - "Findings on venous ultrasound other than DVT"
  - "Ultrasound contrast agents"
- November 26-  
December 1, 2000 86<sup>th</sup> Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- "Focus session: Ultrasound contrast agents"
  - "Liver parenchymal contrast-enhanced ultrasound: Preliminary results of a multi-center study for liver lesion detection"
- December 12, 2000 Long Island Radiological Society, Woodbury, NY
- "Technical advances in ultrasound"
- March 11-14, 2001 45<sup>th</sup> Annual Convention of the American Institute of Ultrasound in Medicine, Orlando, FL
- "Radiofrequency ablation of liver tumors" (categorical course)
  - "General ultrasound film panel"
  - "Detection of liver lesions with the US contrast agent Sonazoid: Results of a multicenter study"



- March 30-  
April 1, 2001 Spring Ultrasound Update 2001, American College of Radiology, Washington and Maryland Chapters, Bethesda, MD
- "Interpretation of carotid ultrasound"
  - "Liver metastasis"
  - "Ultrasound contrast agents"
  - "Interpretation of Doppler"
- April 10, 2001 Hospital of the University of Pennsylvania Grand Rounds, Philadelphia, PA
- "Ultrasound contrast agents" (visiting professor)
  - Case review
- April 17, 2001 University of Massachusetts Medical Center Grand Rounds, Worcester, MD
- "Ultrasound for the diagnosis and treatment of liver tumors" (visiting professor)
- May 8-11, 2001 The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
- Case interpretation
  - Review of protocols
  - "Contrast specific liver imaging"
- May 18, 2001 Diagnostic Dilemmas: Choosing the Best Test 2, Jefferson Health Care College, Philadelphia, PA
- "Peripheral arterial disease"

**PATRICK O'KANE, M.D.**

- April 16-20, 2001 Henry Ford Hospital, Detroit, MI
- Case conference (visiting professor)
- May 8-11, 2001 The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
- Case conference
- May 25-26, 2001 European Summer School Course on Small Parts Ultrasonography, Timisoara, Romania
- "Advances in compound imaging and elastography"

**J. ANTONI PARELLADA, M.D.**

- March 10-11, 2001 5<sup>th</sup> Annual Jefferson Upper Extremity Imaging Symposium, Jefferson Medical College, Philadelphia, PA
- "Musculoskeletal MRI physics: Basic concepts for non-radiologists"
  - "MR of the biceps tendon"
  - "Indirect MR arthrography"
  - "MR characteristics of soft-tissue tumors of the upper extremity"

- April 21-27, 2001      The 9<sup>th</sup> Scientific Meeting and Exhibition of the International Society  
Magnetic Resonance in Medicine-ESMRMB, Joint Annual Meeting,  
Glasgow Scotland
- “Diagnostic axial MRI of rotator cuff injuries” (poster)
- May 16, 2001      Monmouth Medical Center, Long Branch, NJ
- “MR of the knee cartilage and marrow”
  - “MR of knee ligament injuries”
- May 19-20, 2001      6<sup>th</sup> Annual Jefferson Lower Extremity Advanced Imaging Symposium,  
Jefferson Medical College, Philadelphia, PA
- “MR of knee ligament injuries”
  - “MR of knee cartilage and marrow”

### **LAURENCE PARKER, PH.D.**

- November 26-  
December 1, 2000      86<sup>th</sup> Scientific Assembly and Annual Meeting of the Radiological  
Society of North America, Chicago, IL
- “Comparison of recent trends in spine MRI and spine surgery:  
Analysis of the 1996 and 1998 Medicare database”

### **CATHERINE W. PICCOLI, M.D.**

- September 21, 2000      2<sup>nd</sup> International Congress on MR Mammography, Friedrich Schiller  
University, Jena, Germany
- “Contrast-enhanced breast MRI: Diagnostic pitfalls”
  - “MRI of implants”
- December 12, 2000      Mammography Society of Philadelphia, Methodist Hospital,  
Philadelphia, PA
- “MRI guided localization methods for enhancing breast lesions”
- March 23, 2001      Women’s Health and Imaging, American College of Osteopathic  
Radiology, Puerto Vallarta, Mexico
- “MRI of breast implants”
  - “MRI of the female pelvis”
  - “Breast MRI for cancer evaluation”
- March 30-31, 2001      2001: A Breast Imaging Odyssey, Savannah, GA
- “MRI of the breast: Evaluation of bright objects”
  - “MRI guided breast biopsy”
  - “Ultrasound versus MRI for breast implant evaluation”
- May 8-11, 2001      The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas  
Jefferson University Hospital, Atlantic City, NJ
- “Mammography-sonography correlation: The mechanics”
  - “Accuracy of breast ultrasound”
  - “Ultrasound evaluation of breast implants”

**VIJAY M. RAO, M.D.**

- October 5, 2000                      Neuroradiology Review Course, Johns Hopkins Hospital, Baltimore, MD
- “Sinonasal imaging”
  - “Posterior and central skull base”
  - “Lymph nodes”
- November 15, 2000                      Mercy Catholic Medical Center, Fitzgerald Division, Department of Radiology, Darby, PA
- “Sinonasal imaging”
- November 26-  
December 1, 2000                      86<sup>th</sup> Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- “Ostiomeatal complex: Normal anatomy and variants”
  - “Relative roles of imaging modalities in carotid disease: An analysis of a fee-for-service health insurance database”
  - “Diminishing level of participation of emergency medicine physicians in the performance of conventional radiography done in emergency departments”
  - “Comparison of recent trends in spine MRI and spine surgery: Analysis of the 1996 and 1998 Medicare database”
  - “Trends in utilization and practice patterns of endovascular neurointerventions”
- March 8, 2001                              Bryn Mawr Hospital, Department of Radiology, Bryn Mawr, PA
- “Interesting Head and Neck Cases”
- April 23-27, 2001                      39<sup>th</sup> Annual Meeting of the American Society of Neuroradiology, Boston, MA
- “Relative role of imaging modalities in carotid disease: An analysis of a fee-for-service health insurance database”
  - “CT classification of orbital floor fractures: Correlation with postoperative clinical outcome”
- May 16-20, 2001                      49<sup>th</sup> Annual Meeting of the Association of University Radiologists, Toronto, Canada
- “Redefining scholarship in academic radiology: Support for scholarship”
  - “Consensus Conference overview”
- June 29, 2001                              Pennsylvania Academy of Otolaryngology – Head and Neck Surgery, Philadelphia, PA
- “Novel MRI findings in carotidynia” (poster)

**ANA M. SALAZAR, M.D.**

- April 4-6, 2001                              The 18<sup>th</sup> Annual Meeting of the Society of Thoracic Radiology, Boca Raton, FL
- “Pulmonary artery dissection”

**MARK E. SCHWEITZER, M.D.**

- July 26, 2000      Armed Forces Institute of Pathology, Washington, DC
- "MRI of the foot and ankle"
- July 26, 2000      Walter Reed Army Medical Center, Department of Radiology, Washington, DC
- "MRI of the ankle"
- September 13-16, 2000      27<sup>th</sup> Annual Refresher Course, International Skeletal Society, Barcelona, Spain
- "MRI of the post-operative shoulder"
  - "Technical considerations, ligamentous lesions, OCD, occult fractures"
  - "MRI of the foot and ankle" (moderator)
- September 23-24, 2000      Jefferson Spine Imaging Symposium, Jefferson Medical College, Philadelphia, PA
- "Imaging of cervical spine trauma"
  - "MRI of marrow disorders and differentiation of benign and malignant fractures"
- September 27, 2000      Armed Forces Institutes of Pathology, Washington, DC
- "MRI of the foot and ankle"
- October 11-12, 2000      MRI/CT Update 2000 Course, Brigham and Women's Hospital, Boston, MA
- "MRI of the foot and ankle"
  - "MRI of the knee"
  - "MRI of the wrist"
  - "Extremity imaging" (workshop)
- October 24, 2000      Western Pennsylvania Hospital, Pittsburgh, PA
- "MRI of the ankle"
- November 2-5, 2000      Annual Maastrich MRI Symposium, Maastrich, The Netherlands
- "MRI of muscle"
  - "MRI of the wrist"
  - "Hip (part 1)"
  - "Hip (part 2)"
- November 26-  
December 1, 2000      86<sup>th</sup> Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- "Post-operative imaging of the shoulder and knee" (refresher course)
- December 1, 2000      American College of Veterinary Radiology Annual Scientific Meeting, Chicago, IL
- "MRI applications in muscle"
- December 14, 2000      Temple University School of Podiatric Medicine, Philadelphia, PA
- "MRI of tendon disorders of the foot and ankle"
- December 20, 2000      North Shore University Hospital, Manhasset, NY

- January 4, 2001

Yale University School of Medicine, Department of Radiology, New Haven, CT

  - “MRI of muscle”
  - “MRI of the hip”
- January 5, 2001

Yale University School of Medicine, Department of Orthopedics, New Haven, CT

  - “MRI of the foot and ankle”
- January 24, 2001

Armed Forces Institute of Pathology, Washington, DC

  - “MRI of the foot and ankle”
- January 29, 2001

Beth Israel Hospital, Department of Radiology, Boston, MA

  - “MRI of the ankle”
  - “MRI of the wrist”
- February 5, 2001

Brown University/Rhode Island Hospital, Department of Radiology, Providence, RI

  - “MRI of the wrist”
  - “MRI of the hip”
- February 11, 2001

The American College of Foot and Ankle Surgeons Annual Meeting and Scientific Seminar, New Orleans, LA

  - “MRI of tendon and soft tissue”
  - “MRI of bone marrow”
- March 7, 2001

Armed Forces Institute of Pathology, Washington, DC

  - “MRI of the foot and ankle”
- March 10-11, 2001

5<sup>th</sup> Annual Jefferson Upper Extremity Imaging Symposium, Jefferson Medical College, Philadelphia, PA

  - “Musculoskeletal MR physics: Sequence optimization for radiologists”
  - “Post-operative shoulder MR”
  - “Wrist: MR of TFCC, SL and LT”
  - “MRI of wrist marrow”
- March 24-30, 2001

33<sup>rd</sup> International Diagnostic Course, Musculoskeletal Diseases, Davos, Switzerland

  - “Foot and ankle”
- April 21-27, 2001

The 9<sup>th</sup> Scientific Meeting and Exhibition of the International Society Magnetic Resonance in Medicine-ESMRMB, Joint Annual Meeting, Glasgow Scotland

  - “MRI of traumatic marrow disorders”
  - “Sports Injuries in the ankle”
- May 16, 2001

University of Toronto, Toronto, CA

  - “Traumatic marrow disorders”
- May 16-20, 2001

49<sup>th</sup> Annual Meeting of the Association of University Radiologists, Toronto, CA

  - “Engaging residents in research”

- May 19-20, 2001 6<sup>th</sup> Annual Jefferson Lower Extremity Advanced Imaging Symposium, Jefferson Medical College, Philadelphia, PA
- "MRI of ankle tendons"
  - "MRI of sports injured ankle"
  - "MRI of ankle marrow/cartilage"
  - "MRI of the foot"
  - "Physics"
- May 22, 2001 Armed Forces Institute of Pathology, Washington, DC
- "MRI of the foot and ankle"
- June 15, 2001 2<sup>nd</sup> Annual Philadelphia Sports Medicine Congress, Hospital of the University of Pennsylvania, Philadelphia, PA
- "Diagnostic imaging in sports medicine"

**SHARON R. SEGAL, D.O.**

- March 21-25, 2001 American Osteopathic College of Radiology 2001 Mid Year Conference, Women's Health & Mammography, Puerto Vallarta, Mexico
- "Sonohysterography"
  - "OB-GYN emergencies"
  - Case presentation
- May 8-11, 2001 The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
- Vascular case presentation
  - OB-GYN case presentation

**ROSITA M. SHAH, M.D.**

- April 4-6, 2001 The 18<sup>th</sup> Annual Meeting of the Society of Thoracic Radiology, Boca Raton, FL
- "Bronchitis, bronchiectasis and bronchiolitis: The role of imaging"
- April 29-  
May 4, 2001 101<sup>st</sup> Annual Meeting of the American Roentgen Ray Society, Seattle, WA
- "Adjacent parenchymal abnormalities in peripheral bronchogenic carcinoma: Correlation with lymphangio-invasion at CT"
- May 15, 2001 Air Force Institute of Pathology, Six Week Radiology Course, Washington, DC
- "Usual and unusual pulmonary infections"

**WILLIAM T. SHI, PH.D.**

- September 20, 2000 Institute of Acoustics, Nanjing University, Nanjing, China
- "Nonlinear ultrasound contrast imaging"
- September 25-28, 2000 2000 IEEE-EMBS Asia-Pacific Conference on Biomedical Engineering, Hongzhou, China

- October 22-25, 2000

  - “Ultrasound contrast agents and nonlinear imaging”

2000 IEEE International Ultrasonics Symposium, San Juan, Puerto Rico

  - “Active enhancement of ultrasound contrast imaging”
- March 11-14, 2001

45<sup>th</sup> Annual Convention of the American Institute of Ultrasound in Medicine, Orlando, FL

  - “Evaluation of excitation-enhanced ultrasound contrast imaging”
  - “Subharmonic performance of ultrasound contrast agents and subharmonic imaging”
- May 7, 2001

The 7<sup>th</sup> Annual International Symposium on Contrast Agent in Diagnostic Ultrasound, Atlantic City, NJ

  - “New aspects of nonlinear contrast imaging”
- May 24-27, 2001

The 6<sup>th</sup> National Congress of Medical Ultrasound Society of Chinese Medical Association, Nanjing, China

  - “Nonlinear imaging with ultrasound contrast agents”
- June 15-17, 2001

Ultrasound Symposium, University of Innsbruck, Innsbruck, Austria

  - “Harmonic and subharmonic imaging with ultrasound contrast agents”
  - “Effects of contrast microbubble destruction on ultrasound imaging”

**KEVIN L. SULLIVAN, M.D.**

- October 7, 2000

8<sup>th</sup> Annual Interventional Radiology and Vascular Imaging 2000, University of Pennsylvania Medical Center, Philadelphia, PA

  - “How to use venous limb pressures to optimize graft interventions”
- October 10, 2000

Traumenox Investigator Meeting, San Antonio, TX

  - “Role of the core lab”
- December 12, 2000

Embolotherapy: Bench to Bedside, sponsored by the Center for Device Evaluation and Radiological Health, FDA, Laurel, MD

  - “Embolotherapy of hepatic metastases from ocular melanoma”
- March 4-8, 2001

26<sup>th</sup> Annual Scientific Meeting of the Society of Cardiovascular and Interventional Radiology, San Antonio, TX

  - “Survival of patients with hepatic metastases from ocular melanoma following chemoembolization with ethiodol soluble chemotherapy”
  - “Safety of immunoembolization of normal swine liver with human GM-CSF (granulocyte macrophage colony stimulating factor) and ethiodol”

**LISA M. TARTAGLINO, M.D.**

- February 1, 2001

Philadelphia Roentgen Ray Society, Philadelphia, PA

  - “Applications of CT angiography in neuroradiology”
- March 24, 2001

Wills Eye Hospital Trauma Symposium, Philadelphia, PA

  - “CT and MR of orbital trauma”

## MATHEW L. THAKUR, PH.D.

- September 7, 2000 Annual Meeting of the European Association of Nuclear Medicine, post-congress, Bordeaux, France
- “Novel biomolecules in imaging infection/inflammation”
- October 1, 2000 Pre-congress meeting of the 7<sup>th</sup> Meeting of the Asia and Oceania Congress of Nuclear Medicine and Biology, Istanbul, Turkey
- “New radiopharmaceuticals for *in vivo* cell labeling”
- October 1-5, 2000 7<sup>th</sup> Annual Meeting of the Asia and Oceania Congress of Nuclear Medicine and Biology, Istanbul, Turkey
- “New approaches to therapy and diagnosis”
  - “Imaging colorectal cancer: Comparison of receptor specific biomolecules”
- November 4, 2000 Annual Meeting of the Greater New York Chapter of the Society of Nuclear Medicine, Providence, RI.
- “Tc-99m-antiCD15 antibody in imaging infection”
- December 14-19, 2000 2000 International Chemical Congress of Pacific Basin Societies, Honolulu, HI
- “Intratumoral radionuclide therapy”
- February 15, 2001 Hospital of the University of Pennsylvania, Philadelphia, PA
- “Radiopharmaceuticals: Mechanism of uptake”
- April 1-5, 2001 221<sup>st</sup> Annual Congress of the American Chemical Society, San Diego, CA
- “Evaluation of molecular probes for imaging tumors”
- June 12-15, 2001 14<sup>th</sup> International Symposium on Radiopharmaceutical Chemistry, Interlaken, Switzerland
- “Fibrin avid Tc-99m-peptide for imaging thrombosis”
- June 20-22, 2001 10<sup>th</sup> Symposium of the International Society of Radiolabeled Blood Elements, Toronto, Canada
- “<sup>99m</sup>Tc-labeled leukokinin and N-formyl-met-Leu-Phe (fMLF) analogs for imaging inflammation/infection: Comparison in canine model”
  - “Anti-CD15 antibody for imaging infection in humans”
- June 23-27, 2001 48<sup>th</sup> Annual Meeting of the Society of Nuclear Medicine, Toronto, Canada
- “Particle based preparations of Tc-99m peptides”
  - “Evaluation of Tc-99m leukokinin residue analogs for imaging inflammatory foci”

## TERRI TUCKMAN, M.D.

- May 8-11, 2001 The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
- “Twin gestations”



**RICHARD J. WECHSLER, M.D.**

- January 10, 2001                      Bryn Mawr Hospital, Bryn Mawr, PA
- “Emergency room CT”
- January 31, 2001                      Mercy Fitzgerald Hospital, Darby, PA
- “Emergency room CT”
- March 21, 2001                        South Jersey Radiology Symposium, Voorhees, NJ
- “CT of appendicitis and renal stones”

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

- October 14, 2000                      Women's Health Source, Thomas Jefferson University Hospital,  
Philadelphia, PA
- “The importance of screening mammography”
- February 27-  
March 1, 2001                        The Egyptian Society of Ultrasonics, Cairo, Egypt
- “Ultrasound of pelvic pain”
  - “Fetal chest anomalies”
  - “Fetal echocardiography”
- April 14, 2001                        Women's Health Source, Thomas Jefferson University Hospital,  
Philadelphia PA
- “Breast health”
- May 8-11, 2001                        The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas  
Jefferson University Hospital, Atlantic City, NJ
- “Breast ultrasound technique”

## HONORS, EDITORIAL ACTIVITIES, SERVICE TO REGIONAL OR NATIONAL ORGANIZATIONS

### JOSEPH BONN, M.D.

- Member, Internet Strategic Task Force, Society of Cardiovascular and Interventional Radiology
- Member-at-Large, Executive Committee, Council on Cardiovascular Radiology, American Heart Association
- Editor, Abstracts of Current Literature, *Journal of Vascular and Interventional Radiology*
- Consultant to the Editor, Interventional-Cardiovascular section, *Radiology*
- Reviewer, *Academic Radiology*

### JOHN A. CARRINO, M.D.

- Member, DICOM working group 6: Commission on Standards & Accreditation, American College of Radiology
- Member, Task Force on the Internet Communications Committee, American College of Radiology
- Reviewer, *Journal of Digital Imaging*
- Reviewer, *Radiographics*

### W. SCOTT ENOCHS, M.D., PH.D.

- Reviewer, *Journal of Magnetic Resonance Imaging*
- Reviewer, *Radiology*

### DAVID J. ESCHELMAN, M.D.

- Member, Relative Value Update Advisory Committee, Society of Cardiovascular and Interventional Radiology
- Associate Editor, *Journal of Vascular and Interventional Radiology*
- Associate Editor, *Radiology*
- Reviewer, *Journal of Vascular and Interventional Radiology*
- Reviewer, *Radiology*
- Editor's Recognition Award for Special Distinction in Reviewing, *Radiology*

### RICK I. FELD, M.D.

- Chairman, Education (Program) Committee, Philadelphia Roentgen Ray Society
- Vice Chairman, Intraoperative Interventional Section, American Institute of Ultrasound in Medicine
- Member, Executive Board, Philadelphia Roentgen Ray Society
- Member, Ultrasound Section on Human Resources, American College of Radiology
- Member, Exam Development Task Force (Abdomen), American Registry of Diagnostic Medical Sonographers
- Reviewer, *American Journal of Roentgenology*
- Reviewer, *Clinical Imaging*
- Reviewer, *Journal of the American Medical Association*
- Reviewer, *Journal of Clinical Ultrasound*
- Reviewer, *Journal of Ultrasound in Medicine*

- Reviewer, *Journal of Vascular and Interventional Radiology*

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

- Consultant, Contrast Division, Squibb Diagnostics
- Consultant, Imaging, Synthes Corporation
- Consultant, Medical Policy, Independence Blue Cross
- Consultant, Medical Review, Independence Blue Cross
- Consultant, Neuroradiology, Neuron Therapeutics
- Guest Speaker, Squibb Diagnostics Speakers' Bureau
- Member, Electronic Communications Committee, Radiological Society of North America
- Member, Scientific Exhibits Award Committee (SEAC), Radiological Society of North America
- Member, Task Force on Electronic Information, American Society of Neuroradiology
- Reviewer, *American Journal of Neuroradiology*
- Reviewer, *Neuroradiology*
- Reviewer, *The New England Journal of Medicine*
- Reviewer, *The Radiological Society of North America Electronic Journal*

### **FLEMMING FORSBERG, PH.D.**

- Chairperson, Doppler Subcommittee, Technical Standards Committee, American Institute of Ultrasound in Medicine
- Chairperson, Technical Standards Committee, American Institute of Ultrasound in Medicine
- Member, Board of Governors, American Institute of Ultrasound in Medicine
- Member, Advisory Council, Society of Diagnostic Medical Sonographers Educational Fund
- Member, Advisory Editorial Board, Ultrasound in Medicine and Biology
- Reviewer, *IEEE Transactions on Ultrasonics, Ferroelectrics & Frequency Control*
- Reviewer, *Radiology*
- Reviewer, *Ultrasound in Medicine and Biology*
- Second Prize for Scientific Exhibits, "Low intensity ultrasound treatment of the fracture site accelerates fracture healing. Could increase in vascularity be the mechanism?" (exhibit), 45<sup>th</sup> Annual Convention of the American Institute of Ultrasound in Medicine, Orlando, FL, March 2001

### **DAVID P. FRIEDMAN, M.D.**

- Director, Philadelphia Neuroradiology Club
- Member, Education Committee, American Society of Neuroradiology
- Member, Exhibits Committee, 86<sup>th</sup> Scientific Assembly and Annual Meeting of the Radiologic Society of North America
- Reviewer, *American Journal of Roentgenology*
- Reviewer, *Neurology*

### **GEOFFREY A. GARDINER, JR., M.D.**

- Board Examiner, American Board of Radiology for Added Qualifications in Vascular and Interventional Radiology
- Distinguished Scientific Advisor, Radiological Society of North America Research and Education Fund
- Reviewer, *Journal of Vascular and Interventional Radiology*

### **BARRY B. GOLDBERG, M.D.**

- Honorary Fellowship, Royal College of Radiologists, United Kingdom
- Fellow, American Institute for Medical and Biological Engineering
- Outstanding Educator Award, Philadelphia Roentgen Ray Society
- Chairman, Committee on Ultrasound, American College of Radiology Imaging Network
- Chairman, Fiftieth Anniversary Committee, American Institute of Ultrasound in Medicine
- Member, Board of Directors, Breast Cancer and Womens' Health Ultrasound Foundation
- Member, Advisory Board, Radiology Outreach Foundation
- Member, Global Steering Group for Education and Training in Diagnostic Imaging, World Health Organization
- Member, Committee on International Relations and Education (CIRE), 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, Outstanding Researcher Award Review Panel, Research and Education Fund, Radiological Society of North America
- Member, Past Presidents Committee, American Institute of Ultrasound in Medicine
- Member, International Advisory Board, *Indian Journal of Medical Ultrasound*
- Member, Editorial Committee, *Journal Ultrasonido*
- Member, Editorial Board Committee, *Acta Clinica Croatica*
- Editorial Board, *Archives of Clinical Imaging*
- Editorial Board, *Journal d'Echographie et de Medicine Ultrasonore*
- Editorial Board, *Journal of Surgical Ultrasonology*
- Editorial Board, *Journal of Ultrasound in Medicine*
- Editorial Board, *Journal of Ultrasound in Medicine and Biology*
- Editorial Board, *Radiologia*
- Editorial Board, *Ultrasound International Journal*
- Editorial Advisor, *Journal d'Echographie et de Medecine par Ultrasons*
- Editorial Consultant, *Applied Radiology*
- Editorial Consultant, *Chest*
- Editorial Consultant, *Pediatrics*
- Reviewer, *American Journal of Roentgenology*
- Reviewer, *Cancer*
- Reviewer, *Gastroenterology*
- Reviewer, *Gastrointestinal Endoscopy*
- Reviewer, *Journal of the National Cancer Institute*
- Reviewer, *Radiology*

### **CARIN F. GONSALVEZ, M.D.**

- Program Director, Philadelphia Angiography and Interventional Radiology Society
- Reviewer, *Journal of Vascular and Interventional Radiology*

### **ETHAN J. HALPERN, M.D.**

- Reviewer, *Academic Radiology*
- Reviewer, *American Journal of Roentgenology*
- Reviewer, *Annals of Internal Medicine*
- Reviewer, *Artificial Intelligence in Medicine*
- Reviewer, *Radiology*

- Reviewer, *Ultrasound in Medicine and Biology*
- Editor's Recognition Award for Distinction in Reviewing, *Radiology*
- Editor's Award: Top 10% of Reviewers, *Annals of Internal Medicine*

#### **GEORGE A. HOLLAND, M.D.**

- Reviewer, *Academic Radiology*
- Reviewer, *Radiology*

#### **CHARLES M. INTENZO, M.D.**

- Member, Academic Council, Society of Nuclear Medicine
- Member, Therapy Council, Society of Nuclear Medicine
- Reviewer, *Journal of Nuclear Medicine*
- Reviewer, *Radiographics*
- Reviewer, *Radiology*
- Editor's Recognition Award for Distinction in Reviewing, *Radiology*

#### **DAVID KARASICK, M.D.**

- Member, Closed Meeting Case Review, International Skeletal Society
- Editor-in-Chief, *Seminars in Musculoskeletal Radiology* (Thieme Publishing Co.)
- Consulting Editor, *Skeletal Radiology*
- Manuscript Reviewer, Musculoskeletal Radiology, *American Journal of Roentgenology*
- Manuscript Reviewer, Musculoskeletal Radiology, *Radiology*

#### **STEPHEN KARASICK, M.D.**

- Examiner, Gastrointestinal Section, American Board of Radiology
- Reviewer, *American Journal of Roentgenology*
- Reviewer, *Radiology*

#### **SUNG M. KIM, M.D.**

- 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
- Reviewer, *Journal of Nuclear Medicine*

#### **ALFRED B. KURTZ, M.D.**

- President, American Institute of Ultrasound in Medicine
- Member, Finance Committee, American Institute of Ultrasound in Medicine
- Member, Committee on Ultrasound Accreditation, Subcommittee on Quality Control Manual, American College of Radiology
- Member, Outstanding Educator Awards Committee, Philadelphia Roentgen Ray Society
- Associate Editor, Ultrasonography, *Radiology*

- Editorial Board, *Journal of Ultrasound in Medicine*
- Editorial Board, *Journal of Women's Imaging*
- Member, Manuscript Review Panel, *American Journal of Roentgenology*
- Senior Film Reviewer, Ultrasound Accreditation, Commission on Standards and Accreditation, American College of Radiology
- Special Reviewer, *Gynecologic Oncology*
- Special Reviewer, *Obstetrics and Gynecology*
- Special Reviewer, *Ultrasound in Medicine and Biology*
- Reviewer, *American Family Physician*
- Reviewer, *American Journal of Obstetrics and Gynecology*
- Reviewer, *Cancer*
- Reviewer, *Journal of the American Medical Association*
- Reviewer, *Radiographics*
- Reviewer, Ultrasonography, *Radiology*

### **STEVEN G. LEE, M.D.**

- Secretary, Mammography Society of Philadelphia

### **DAVID C. LEVIN, M.D.**

- Distinguished Alumnus Award of the Department of Radiology, Brigham & Women's Hospital/Harvard Medical School
- Chairman, Committee on Health Policy and Practice, Radiological Society of North America
- Vice Chairman, Commission on Medical Insurance, Pennsylvania Radiological Society
- Vice Chairman, Committee on Radiology Practice and Management, Pennsylvania Radiological Society
- Delegate, Pennsylvania Medical Society House of Delegates, Pennsylvania Medical Society
- Scientific Advisor, Research and Education Fund, Radiological Society of North America
- Member, Committee on Cardiovascular Imaging, American College of Radiology
- Member, Committee on Diagnostic Radiology, Pennsylvania Radiological Society
- Member, Ad hoc Appropriateness/Coding Committee, American College of Radiology
- Member, Public Information Advisory Board, Radiological Society of North America
- Member, Commission on Research and Technology Assessment, American College of Radiology
- Member, Council on Policy and Governmental Affairs, Pennsylvania Medical Society
- Member, Committee on Managed Care, American College of Radiology
- Member, Committee on Radiology Practice and Management, Pennsylvania Radiological Society
- Member, Public Relations and Marketing Committee, Pennsylvania Radiological Society
- Member, Publications Committee, Pennsylvania Radiological Society
- Member, Research and Education Fund Program Committee, Radiological Society of North America
- Member, Radiology Advisory Committee, Keystone Health Plan East (HMO)
- Consultant, Independence Blue Cross
- Editorial Board, *American Journal of Roentgenology*
- Editorial Board, *Current Diagnosis*
- Reviewer, *American Journal of Roentgenology*
- Reviewer, *New England Journal of Medicine*
- Reviewer, *Radiology*

### **ANNA S. LEV-TOAFF, M.D.**

- Panelist, Society of Radiologists in Ultrasound Consensus Conference on Post-menopausal bleeding, Washington, DC
- Book Reviewer, *American Journal of Roentgenology*
- Abstract Reviewer, *American Institute of Ultrasound in Medicine Conference*
- Reviewer, *American Journal of Roentgenology*
- Reviewer, *Journal of Ultrasound in Medicine*
- Reviewer, *Obstetrics and Gynecology*
- Reviewer, *Radiology*
- Reviewer, *Ultrasound in Obstetrics and Gynecology*

### **JI-BIN LIU, M.D.**

- Guest Professorship at Fourth Military Medical University, Xian, China
- Editorial Board, *Chinese Journal of Medical Imaging Technology*
- Reviewer, *Ultrasound in Medicine and Biology*
- Second Prize for Review Exhibits, "US-guided radiofrequency ablation: Laboratory and clinical experience" (exhibit), 86th Annual Meeting of the Pennsylvania Radiological Society, Hershey, PA, May 2001

### **ANDREW D.A. MAIDMENT, M.D.**

- Chairman, Task Group 16: Noise Power Spectrum Analysis, American Association of Physicists in Medicine
- Phantom Reviewer, Stereotactic Breast Biopsy Accreditation Program, American College of Radiology
- Member, Committee on Stereotactic Breast Biopsy Accreditation, Stereotactic Physics Subcommittee, American College of Radiology
- Member, Committee of DICOM, American College of Radiology
- Member, DICOM Working Group 15: Digital Mammography, American College of Radiology
- Member, Diagnostic X-ray Imaging Committee, American Association of Physicists in Medicine
- Member, Task Group 14: Digital Mammography for Stereotactic Localization, American Association of Physicists in Medicine
- Member, Teleradiology Working Group, American College of Radiology
- Member, Program Committee, American Association of Physicists in Medicine
- Scientific Director, American Association of Physicists in Medicine, Salt Lake City Annual Meeting
- Associate Editor, *Medical Physics*
- Editorial Advisory Committee, *American Journal of Roentgenology*
- Reviewer, *American Journal of Roentgenology*
- Reviewer, *Breast Cancer Research and Treatment*
- Reviewer, *IEEE Transactions of Biomedical Engineering*
- Reviewer, *IEEE Transactions of Medical Imaging*
- Reviewer, *Journal of the Optical Society of America*
- Reviewer, *Medical Physics*
- Reviewer, *Physics in Medicine and Biology*

### **CHRISTOPHER R.B. MERRITT, M.D.**

- Trustee, American Board of Radiology

- Treasurer, World Federation of Ultrasound in Medicine and Biology
- Acting Director, Informatics, American Board of Radiology
- Category Chair, Ultrasound, American Board of Radiology
- Chair, Commission on Ultrasound, American College of Radiology
- Chair, Editorial Policy Committee, American Roentgen Ray Society
- Chair, Publications Committee, American Roentgen Ray Society
- Written Committee Chair, Radiation Biology, American Board of Radiology
- Member, Executive Council, American Roentgen Ray Society
- Member, Board of Chancellors, American College of Radiology
- Editor, *World Federation for Ultrasound in Medicine and Biology News*. Newsletter of the World Federation for Ultrasound in Medicine and Biology
- Contributing Editor, *Breast Diseases Quarterly*
- Contributing Editor, *Ultrasound Quarterly*
- Consulting Editor, *Radiology - Diagnosis, Imaging, Intervention*
- Editorial Advisor, *Journal of Ultrasound in Medicine*
- Editorial Advisor, *Journal of Vascular Investigation*
- Editorial Advisor, *Journal of Vascular Technology*
- Reviewer, *Academic Radiology*
- Reviewer, *American Journal of Roentgenology*
- Reviewer, *Cancer*
- Reviewer, *Radiology*
- Reviewer, *Ultrasound in Medicine and Biology*

#### **WALLACE MILLER, M.D.**

- Guest Editorship, *Seminars in Roentgenology*
- Reviewer, *Academic Radiology*
- Reviewer, *Annals of Thoracic Surgery*
- Reviewer, *Chest*
- Reviewer, *Journal of Thoracic Imaging*
- Reviewer, *Radiology*

#### **DONALD G. MITCHELL, M.D.**

- Member, Ad Hoc Expert Panel for Estimating Physician Work Relative Values for Magnetic Resonance Imaging, American College of Radiology
- Member, Committee on Research and Technology, American College of Radiology
- Member, Committee on Research & Technology Assessment, Commission on Neuroradiology & Magnetic Resonance, American College of Radiology
- Member, Education Committee, International Society for Magnetic Resonance in Medicine
- Member, MRI Committee, American College of Radiology Imaging Network
- Member, Scientific Program Committee, International Society for Magnetic Resonance in Medicine
- Associate Editor, *Journal of Magnetic Resonance Imaging*
- Editorial Board, *Abdominal Imaging*
- Editorial Board, *Journal of Computer Assisted Tomography*
- Abstract Reviewer, 9<sup>th</sup> Meeting of the International Society for Magnetic Resonance in Medicine
- Reviewer, *Academic Radiology*
- Reviewer, *American Journal of Roentgenology*
- Distinguished Committee Service Award, American College of Radiology



### **WILLIAM B. MORRISON, M.D.**

- Co-Coordinator and Panelist, Delaware Valley Orthopedic-Radiologic-Pathology Conference
- Abstract Reviewer, 9<sup>th</sup> Meeting of the International Society for Magnetic Resonance in Medicine
- Reviewer, *American Journal of Roentgenology*
- Reviewer, *Radiology*
- A. Edward O'Hara, M.D. Award for Excellence in Teaching, Department of Radiology, Thomas Jefferson University
- Judith Dubbs Memorial Research Award, Department of Radiology, Thomas Jefferson University

### **LEVON N. NAZARIAN, M.D.**

- Liaison, American Registry of Radiologic Technologists Vascular Sonography Exam Committee, Commission of Human Resources, American College of Radiology
- Editorial Board, Seminars in *Musculoskeletal Radiology*
- Reviewer, *American Journal of Roentgenology*
- Reviewer, *Journal of Ultrasound in Medicine*
- Reviewer, *Radiology*
- Recipient, Seed Grant, Research and Education Foundation, Radiological Society of North America
- Memorial Award, Association of University Radiologists
- Editor's Recognition Award for Distinction in Reviewing, *Radiology*

### **LAURENCE NEEDLEMAN, M.D.**

- Vice-Chair, Corporate Affairs Committee, Society of Radiologists in Ultrasound
- Member, Commission on Standards, American College of Radiology
- Member, Clinical Standards Committee, American Institute of Ultrasound in Medicine
- Member, Committee on Ultrasonography, Pennsylvania Radiological Society
- Member, Committee on Bylaws, Philadelphia Roentgen Ray Society
- Clinical Reviewer, Ultrasound Accreditation Program, American College of Radiology
- Editorial Board, *Journal of Ultrasound in Medicine*
- Reviewer, *Academic Radiology*
- Reviewer, *Journal of Ultrasound in Medicine*

### **PATRICK O'KANE, M.D.**

- Incoming Secretary, Greater Delaware Valley Ultrasound Society

### **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
- Reviewer, *American Journal of Roentgenology*
- Reviewer, *Ultrasound in Medicine and Biology*

## VIJAY M. RAO, M.D.

- President-Elect, Association of Program Directors in Radiology
- Secretary, American Society of Head and Neck Radiology
- Chairperson, Invitational Consensus Conference, Research and Education Fund, Radiological Society of North America
- Member, Board of Directors, Association of Program Directors in Radiology
- Member, Editorial Executive Committee, *Academic Radiology*
- Member, Executive Committee, American Society of Head and Neck Radiology
- Member, Education Committee, American Society of Neuroradiology
- Member, Research Committee, American Society of Neuroradiology
- Member, Committee on Government Issues, Association of Program Directors in Radiology
- Member, Program Committee, Research and Education Fund, Radiological Society of North America
- Member, Scientific Program Committee, Radiological Society of North America
- Member, Scientific Program Committee, Association of Program Directors in Radiology
- Reviewer, Scientific Exhibits, Radiological Society of North America, *Radiographics*
- Reviewer, Scientific Abstracts, 86<sup>th</sup> Scientific Assembly and Annual Meeting of the Radiological Society of North America
- Reviewer, Scientific Abstracts, Annual Meeting of the Association of University Radiologists
- Reviewer, Scientific Abstracts, Annual Meeting of the American Society of Head and Neck Radiology
- Reviewer, Scientific Abstracts, 39<sup>th</sup> Annual Meeting of the American Society of Neuroradiology
- Reviewer, *American Journal of Roentgenology*
- Reviewer, *Neuroradiology*
- Reviewer, *Radiographics*
- Reviewer, *Radiology*
- Editor's Certificate of Recognition for Review of Manuscripts, *Radiographics*
- Editors Certificate of Recognition for Review of Scientific Exhibits, *Radiographics*

## MARK E. SCHWEITZER, M.D.

- Distinguished Scientific Advisor, Radiological Society of North America Research and Education Fund
- Chairman, Musculoskeletal Study Group Committee, International Society for Magnetic Resonance in Medicine
- Program Director, Musculoskeletal Study Group, International Society for Magnetic Resonance in Medicine
- Course Director, Radiological Society of North America
- Course Director, International Society of Magnetic Resonance in Medicine
- Member, Musculoskeletal Review Committee, American College of Radiology
- Member, Committee on Neuroradiology and Magnetic Resonance Imaging, American College of Radiology
- Member, Committee on Research & Technology Assessment, American College of Radiology
- Member, Auditing Committee, International Skeletal Society
- Member, Advisory Panel, Food and Drug Administration
- Member, Expert Panel, Orthopedic Radiology, Pathology Society
- Member, Scientific Program Committee, International Society for Magnetic Resonance in Medicine
- Member, Membership Committee, International Skeletal Society
- Co-Editor-in-Chief, *Seminars in Musculoskeletal Imaging*
- Editorial Board, *Skeletal Radiology*
- Abstract Reviewer, International Society for Magnetic Resonance in Medicine Annual Meeting
- Reviewer, *Academic Radiology*
- Reviewer, *American Journal of Roentgenology*

- Reviewer, *Annals of Internal Medicine*
- Reviewer, *Arthritis and Rheumatism*
- Reviewer, *Journal of Clinical Rheumatology*
- Reviewer, *Journal of Clinical Ultrasound*
- Reviewer, *Journal of Computed Assisted Tomography*
- Reviewer, *Journal of Magnetic Resonance Imaging*
- Reviewer, *Radiographics*
- Reviewer, *Radiology*
- Reviewer, *Skeletal Radiology*

#### **ROSITA M. SHAH, M.D.**

- Editor, Pulmonary Infections, ACR Chest Teaching File
- Reviewer, *American Journal of Roentgenology*
- Reviewer, *Radiographics*
- Reviewer, *Radiology*

#### **WILLIAM T. SHI, PH.D.**

- Reviewer, *Ultrasound in Medicine and Biology*

#### **KEVIN L. SULLIVAN, M.D.**

- Member, Research Committee, Society of Cardiovascular and Interventional Radiology
- Consultant to the Editor, *Journal of Vascular and Interventional Radiology*
- Reviewer, *Radiology*

#### **LISA M. TARTAGLINO, M.D.**

- Reviewer, *Radiology*

#### **MATHEW L. THAKUR, PH.D.**

- Delegate-at-Large, Society of Nuclear Medicine
- Chair, Grant Review Service, United States Department of Energy
- Chair, Scientific Program Committee, Annual Post-Congress of the European Association of Nuclear Medicine
- Chair, Scientific Program Committee, Pre-Congress Meeting of the 7<sup>th</sup> Asia and Oceania Congress In Nuclear Medicine and Biology
- Chair, Young Investigators Award Committee, International Society of Radiolabeled Blood Elements
- Chair, Best Abstract Award Committee, Indo-American Society of Nuclear Medicine
- Member, Board of Governors, Greater New York Chapter, The Society of Nuclear Medicine
- Member, Advisory Committee, International Atomic Energy Agency
- Member, Advisory Committee, Kuwait Medical Research Council
- Member, Advisory Committee, Laurence Berkeley National Laboratory
- Member, Advisory Committee, US Pharmacopea
- Member, Lifetime Achievement Award Committee, Indo-American Society of Nuclear Medicine
- *Ad hoc* member, Grant Review Service, National Institutes of Health

- Member, Grant Review Service, Canadian Medical Research Council
- Member, Grant Review Service, The Wellcome Trust, United Kingdom
- Member, Grant Review Service, Foundation for Medical Research, Vienna, Austria
- Associate Editor, *Cancer Research*
- Guest Editor, *Seminars In Nuclear Medicine*
- Editorial Board, *European Journal of Nuclear Medicine*
- Editorial Board, *Journal of the Association of Latin American Societies of Nuclear Medicine and Biology*
- Editorial Board, *Journal of the Indian Association of Clinical Medicine*
- Editorial Board, *Journal of Labelled Compounds and Radiopharmaceuticals*
- Editorial Board, *Journal of Nuclear Medicine*
- Editorial Board, *Journal of Nuclear Medicine and Biology*
- Editorial Board, *Nuclear Medicine Communications*
- Editorial Board, *Spanish Journal of Nuclear Medicine*
- Reviewer, *Cancer Research*
- Reviewer, *European Journal of Nuclear Medicine*
- Reviewer, *Journal of Chromatography*
- Reviewer, *Journal of Labelled Compounds and Radiopharmaceuticals*
- Reviewer, *Journal of Nuclear Medicine*
- Reviewer, *Journal of Nuclear Medicine and Biology*
- Reviewer, *Life Sciences*
- Reviewer, *Nuclear Medicine Communications*

#### **TERRI TUCKMAN, M.D.**

- Speaker of the House of Delegates, Board of Directors of the American Medical Women's Association
- Chair, Committee on Gender Equity, American Medical Women's Association
- Chair, Personal Development Committee, American Medical Women's Association
- Member, Career Development Task Force, American Medical Women's Association

#### **RICHARD J. WECHSLER, M.D.**

- Councilor, American College of Radiology
- Chairman, Annual Oration Committee, Philadelphia Roentgen Ray Society
- Member, Board of Directors, Pennsylvania Radiological Society
- Member, Board of Censors, Philadelphia Roentgen Ray Society
- Member, General Radiology Accreditation Committee, Commission of Standards and Accreditation, American College of Radiology
- Member, Education Program Committee, Philadelphia Roentgen Ray Society
- Member, Budget Committee, Philadelphia Roentgen Ray Society
- Member, Nominating Committee, Pennsylvania Radiological Society
- Reviewer, *Radiology*
- Editor's Recognition Award for Distinction in Reviewing, *Radiology*

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

- State Director, American Medical Women's Association
- Member, Women's Health Committee, American Medical Women's Association

**ELAINE WOLK, M.D.**

- Member, Clinical Image Review Subcommittee, Mammography Accreditation Program, American College of Radiology

## APPENDIX

**Table 1      ACTIVE GRANTS**

**Table 2      PENDING GRANTS**

**TABLE 1**

**Active Grants**

07/01/00 - 06/30/01

(Report reflects entire award period and current fiscal year of award)

**NIH/OTHER FEDERAL GRANTS**

PRINCIPAL INVESTIGATOR	TITLE OF PROJECT	FUNDING SOURCE	FUNDING DATES	DIRECT COSTS	INDIRECT COSTS	TOTAL COSTS FUNDED
Forsberg, F. X06101	Contrast Enhanced 3D Color Amplitude Imaging of Breasts	U.S. Army Medical Research Acq.	09/15/97 - 09/14/01 one year no cost extension	\$131,493 --- \$32,873 (current fiscal yr)	\$79,987 --- \$19,997 (current fiscal yr)	\$211,480 --- \$52,870 (current fiscal yr)
Forsberg, F. X07401	Estimation of Tumor Angiogenesis with Contrast Enhanced Subharmonic Ultrasound Imaging	U.S. Army Medical Research Acq. DAMD17-00-1-0464	07/01/00 - 06/30/03	\$185,099 --- \$58,387 (current fiscal yr)	\$109,209 --- \$27,583 (current fiscal yr)	\$294,308 --- \$85,970 (current fiscal yr)
Forsberg, F. X07601	Multi-Pulse Ultrasound Contrast Imaging for Improved Breast Cancer Diagnosis	U.S. Army Medical Research Acq. DAMD17-00-1-0662	09/01/00 - 08/31/02 one year no cost extension	\$50,000 --- \$20,833 (current fiscal yr)	\$29,500 --- \$12,292 (current fiscal yr)	\$79,500 --- \$33,125 (current fiscal yr)
Goldberg, B. R38605	Breast Cancer Detection Using Ultrasound Contrast	NIH 1 RO1 CA60854 05 year	04/01/96 - 01/31/01	\$700,981 --- \$84,601 (current fiscal yr)	\$456,914 --- \$55,145 (current fiscal yr)	\$1,157,895 --- \$139,746 (current fiscal yr)
Goldberg, B. Z10805 (subcontract) Drexel (J. Reid)	Developing of Tissue Characterization Methods	NIH 2 PO1 CA52823 09 year	09/30/91 - 06/30/02	\$380,342 --- \$48,652 (current fiscal yr)	\$242,945 --- \$28,705 (current fiscal yr)	\$623,287 --- \$77,357 (current fiscal yr)
Goldberg, B. Z16601	American College of Radiology Cooperative Group Mechanism of the ACR Imaging Network	NIH ACR	03/06/99 - 12/31/01	\$7,330 --- \$2,602 (current fiscal yr)	\$1,670 --- \$593 (current fiscal yr)	\$9,000 --- \$3,195 (current fiscal yr)
Liu, J. Z20601 (subcontract) Creare, Inc.	In Situ, High Speed Scanning Acoustic Microscope	NIH	08/01/00 - 03/31/02	\$128,301 --- \$64,151 (current fiscal yr)	\$75,699 --- \$37,849 (current fiscal yr)	\$204,000 --- \$102,000 (current fiscal yr)

Maidment, A. R11405 (Feig)	Clinical Evaluation of Digital Mammography	NIH 5 ROI CA60192 07 year	09/30/93 - 06/30/01 2nd year no cost extension	\$306,482 -- \$39,546 (current fiscal yr)	\$180,824 -- \$23,332 (current fiscal yr)	\$487,306 -- \$62,878 (current fiscal yr)
Maidment, A.. X05901	3D Digital Imaging of Breast Calcifications: Improvements in Image Quality and Development	U.S. Army Medical Research Acq. DAMD17-98-1-8169	08/15/97 - 09/14/02 2nd year no cost extension	\$209,470 -- \$41,207 (current fiscal yr)	\$104,056 -- \$20,470 (current fiscal yr)	\$313,526 -- \$61,677 (current fiscal yr)
Maidment, A.. X06501	3-Dimensional Imaging of the Breast	U.S. Army Medical Research Acq. DAMD17-98-1-8169	09/15/98 - 09/14/02 one year no cost extension	\$214,379 -- \$53,595 (current fiscal yr)	\$115,389 -- \$28,847 (current fiscal yr)	\$329,768 -- \$82,442 (current fiscal yr)
Maidment, A.. X07201	A Novel Method for Determining Calcification Composition	U.S. Army Medical Research Acq. DAMD17-00-1-0465	06/01/01 - 05/31/04	\$224,176 -- \$6,227 (current fiscal yr)	\$97,498 -- \$2,708 (current fiscal yr)	\$321,674 -- \$8,935 (current fiscal yr)
Merritt, C. Z19802 (subcontract) University of TX	In Vivo Evaluation of Elastography	NIH 2 PO1 CA64597 07 year	08/1/99 - 5/31/04	\$788,353 -- \$154,128 (current fiscal yr)	\$463,394 -- \$90,935 (current fiscal yr)	\$1,251,747 -- \$245,063 (current fiscal yr)
Mitchell, D. Z19201	Role of Radiology in the Pretreatment Evaluation of Invasive Cervical Cancer	NIH ACRIN	01/01/00 - 12/31/01	\$18,885 -- \$9,443 (current fiscal yr)	\$4,721 -- \$2,361 (current fiscal yr)	\$23,606 -- \$11,804 (current fiscal yr)
Piccoli, C. Z15301 (subcontract) Create, Inc.	High Frequency Two-Dimensional Ultrasonic Transducers	NIH/SBIR 2 R44 CA73288	11/15/98 - 02/28/02 18 month no cost extension	\$123,457 -- \$37,506 (current fiscal yr)	\$76,543 -- \$23,254 (current fiscal yr)	\$200,000 -- \$60,760 (current fiscal yr)
Thakur, M. Z16002 (subcontract) Palatin Tech.	Imaging Thromboembolism with Fibrin Avid Tc-99m-Peptide	NIH/SBIR 2 R42 HL59769	03/01/01 - 02/28/02	\$125,643 -- \$41,881 (current fiscal yr)	\$74,129 -- \$24,710 (current fiscal yr)	\$199,772 -- \$66,591 (current fiscal yr)



Thakur, M. Z17301 (subcontract) Palatin Tech.	Novel 99m-Tc-Tufts in for Imaging Inflammation Foci	NIH/SBIR 5 R44 A139343	04/01/99 - 03/31/01 12 month no cost extension	\$47,680 --- \$17,880 (current fiscal yr)	\$28,489 --- \$10,683 (current fiscal yr)	\$76,169 --- \$28,563 (current fiscal yr)
<b>TOTAL NIH/FEDERAL          FUNDING</b>				\$3,642,071 --- \$713,512 (current fiscal yr)	\$2,140,967 --- \$409,464 (current fiscal yr)	\$5,783,038 --- \$1,122,976 (current fiscal yr)
<b>CURRENT YEAR NIH/          FEDERAL FUNDING</b>						

Active Grants  
07/01/00 - 06/30/01

(Report reflects entire award period and current fiscal year of award)

## FOUNDATION/NON-PROFIT ORGANIZATION GRANTS

PRINCIPAL INVESTIGATOR	TITLE OF PROJECT	FUNDING SOURCE	FUNDING DATES	DIRECT COSTS	INDIRECT COSTS	TOTAL COSTS FUNDED
Goldberg, B. A30501	Communications Coordination with the Ultrasound Affiliate Training Center and the Maintenance of TJU-JUREI's Web Site	Open Society Institute	01/14/98 - 12/31/01	\$50,000 -- \$12,632 (current fiscal yr)	\$0 -- \$0 (current fiscal yr)	\$50,000 -- \$12,632 (current fiscal yr)
Goldberg, B. A30801	Coordination and Solicitation of Equipment Donations for the Ultrasound Affiliate Training Centers In Eastern Europe and the Former Soviet Union	Open Society Institute	01/14/98 - 12/31/01	\$50,000 -- \$12,632 (current fiscal yr)	\$0 -- \$0 (current fiscal yr)	\$50,000 -- \$12,632 (current fiscal yr)
Goldberg, B. A30901	Core Curriculum Project for the Ultrasound Affiliate Training Centers in Eastern Europe and the Soviet Union	Open Society Institute	01/14/98 - 12/31/01	\$503,799 -- \$127,276 (current fiscal yr)	\$0 -- \$0 (current fiscal yr)	\$503,799 -- \$127,276 (current fiscal yr)
Goldberg, B. B04101	Training Program in Diagnostic Ultrasound Visiting Professor Program	Open Society Institute	03/22/99 - 12/31/00	\$30,000 -- \$10,811 (current fiscal yr)	\$0 -- \$0 (current fiscal yr)	\$30,000 -- \$10,811 (current fiscal yr)
Goldberg, B. B04201	Training Program in Diagnostic Ultrasound Outstanding Scholars Program	Open Society Institute	02/22/99 - 08/21/00	\$60,000 -- \$5,567 (current fiscal yr)	\$0 -- \$0 (current fiscal yr)	\$60,000 -- \$5,567 (current fiscal yr)
Goldberg, B. B06601	Continuation of New Initiatives Program	Open Society Institute	01/01/00 - 12/31/01	\$104,450 -- \$69,633 (current fiscal yr)	\$0 -- \$0 (current fiscal yr)	\$104,450 -- \$69,633 (current fiscal yr)

Goldberg, B. B07901	Teach the Teachers	Radiologic Society of North America	01/01/01 - 12/31/03	\$300,000 --- \$50,000 (current fiscal yr)	\$0 --- \$0 (current fiscal yr)	\$300,000 --- \$50,000 (current fiscal yr)
Kurtz, A. F47801	3D Multiplanar Transvaginal Sonography of the Cervix in Women at High Risk for Premature Delivery	Medison-Kretz 3D Research Foundation	07/01/99 - 06/30/01 one year no cost extension	\$10,000 --- \$4,988 (current fiscal yr)	\$0 --- \$0 (current fiscal yr)	\$10,000 --- \$4,988 (current fiscal yr)
Maidment, A. F40701	Clinical Evaluation of Digital Mammography	Breast Health Institute	07/01/97 - 07/01/01 one year no cost extension	\$80,000 --- \$20,000 (current fiscal yr)	\$0 --- \$0 (current fiscal yr)	\$80,000 --- \$20,000 (current fiscal yr)
Shi, W. F43803	Subharmonic Imaging and Subharmonic-Aided Pressure Estimation with Microbubble- Based Ultrasound Contrast Agents	Whitaker Foundation	09/01/98 - 08/31/01	\$180,208 --- \$54,011 (current fiscal yr)	\$29,392 --- \$10,323 (current fiscal yr)	\$209,600 --- \$64,334 (current fiscal yr)
<b>TOTAL NON-PROFIT FUNDING</b>				\$1,368,457	\$29,392	\$1,397,849
<b>CURRENT YEAR NON-PROFIT FUNDING</b>				\$367,550	\$10,323	\$377,873

Active Grants

07/01/00 - 06/30/01

(Report reflects entire award period and current fiscal year of award)

**INDUSTRIAL GRANTS**

PRINCIPAL INVESTIGATOR	TITLE OF PROJECT	FUNDING SOURCE	FUNDING DATES	DIRECT COSTS	INDIRECT COSTS	TOTAL COSTS FUNDED
Bonn, J. D83701	A Prospective Evaluation of the Meadox VANGUARD and PASSENGER Endoprosthesis for of InfraRenal Abdominal Aortic Aneurysm and Aorto-Iliac Aneurysm in Humans	Meadox Medicals (Core Lab)	08/22/97 - 06/30/01	\$205,834 -- \$53,348 (current fiscal yr)	\$51,459 -- \$13,337 (current fiscal yr)	\$257,293 -- \$66,685 (current fiscal yr)
Bonn, J. D90501	Symphony Nitinol Stent for Treatment of Iliac Artery Stenosis	Boston Scientific Corporation	04/25/97 - 12/30/00	\$50,142 -- \$8,357 (current fiscal yr)	\$12,535 -- \$2,089 (current fiscal yr)	\$62,677 -- \$10,446 (current fiscal yr)
Feld, R. D53901	The Prevention of Deep Vein Thrombosis in Acute Spinal Cord Injury Comparing Enoxaparin vs Low Dose Heparin Plus External Pneumatic Compression During the First Two Weeks Followed by Enoxaparin vs Low Dose Heparin in the Remaining Six Weeks	Rhone-Poulenc Rorer	03/01/95 - 06/30/01	\$72,960 -- \$11,520 (current fiscal yr)	\$18,240 -- \$2,880 (current fiscal yr)	\$91,200 -- \$14,400 (current fiscal yr)
Forsberg, F. A25901	Optimized Harmonic Imaging with Contrast (Loqiq 700)	General Electric Company	05/15/97 - 03/15/01	\$46,071 -- \$10,015 (current fiscal yr)	\$16,539 -- \$3,595 (current fiscal yr)	\$62,610 -- \$13,610 (current fiscal yr)
Forsberg, F. A31501	Evaluation of the Equipment and the Development of a New Contrast Echo Approach to Detect Tissue Perfusion Using the Equipment and Flow Estimation Using Flash Echo Imaging	Toshiba America Medical Systems	10/01/97 - 09/30/00	\$29,433 -- \$2,453 (current fiscal yr)	\$10,567 -- \$881 (current fiscal yr)	\$40,000 -- \$3,334 (current fiscal yr)

Forsberg, F. A39401	Ultrasound Contrast Imaging of Canine CTVS Prostate Tumors	Nycomed Amersham	07/01/99 - 12/30/00	\$36,512 -- \$12,171 (current fiscal yr)	\$13,107 -- \$4,369 (current fiscal yr)	\$49,619 -- \$16,540 (current fiscal yr)
Forsberg, F. A45101	Ultrasound Imaging Properties of Conventional and New Brachytherapy Seeds	Nycomed Amersham	07/18/00 - 07/17/01	\$19,920 -- \$19,090 (current fiscal yr)	\$4,980 -- \$4,773 (current fiscal yr)	\$24,900 -- \$23,863 (current fiscal yr)
Forsberg, F. A47101	Assessment of EPG as Ultrasound Contrast Agents	Viritech, Inc.	10/01/00 - 09/30/01	\$10,000 -- \$7,500 (current fiscal yr)	\$2,500 -- \$1,875 (current fiscal yr)	\$12,500 -- \$9,375 (current fiscal yr)
Forsberg, F. A49101	Quantifying Tumor Neovascularity Using Contrast Enhanced Ultrasound	Nycomed Amersham	12/15/00 - 12/14/01	\$22,382 -- \$12,124 (current fiscal yr)	\$5,596 -- \$3,031 (current fiscal yr)	\$27,978 -- \$15,155 (current fiscal yr)
Gardiner, G. D54801	The Prevention of Deep Vein Thromb- osis in Acute Spinal Cord Injury Comp- aring Enoxaparin vs Low Dose Heparin Plus External Pneumatic Compression During the First Two Weeks Followed by Enoxaparin vs Low Dose Heparin in the Remaining Six Weeks	Rhone-Poulenc Rorer	04/06/95 - 03/31/01	\$42,112 -- \$5,264 (current fiscal yr)	\$10,528 -- \$1,316 (current fiscal yr)	\$52,640 -- \$6,580 (current fiscal yr)
Gardiner, G. D89201	Safety and Efficacy of Symphony Nitinol Stent Core Lab	Boston Scientific Corporation	02/05/98 - 03/04/01	\$16,569 -- \$3,582 (current fiscal yr)	\$2,485 -- \$537 (current fiscal yr)	\$19,054 -- \$4,119 (current fiscal yr)
Goldberg, B. A46101	Sequoia Contrast Agent Research Project for Woodshucks	Acuson	09/01/00 - 08/31/01	\$7,358 -- \$6,132 (current fiscal yr)	\$2,642 -- \$2,202 (current fiscal yr)	\$10,000 -- \$8,334 (current fiscal yr)

Goldberg, B. D73801	Diagnostic Imaging Studies (Core, Preclinical, Clinical)	Nycomed Amersham	11/18/96 - 12/28/02	\$730,000 -- \$119,346 (current fiscal yr)	\$182,500 -- \$29,837 (current fiscal yr)	\$912,500 -- \$149,183 (current fiscal yr)
Goldberg, B. H14601	Evaluation of the Efficacy of Using the Oral Contrast Agent SonoRx to Reduce Musculoskeletal Pain and Discomfort in Diagnostic Medical Sonographers	Bracco Diagnostics	11/22/99 - 11/21/00	\$32,935 -- \$12,625 (current fiscal yr)	\$8,234 -- \$3,156 (current fiscal yr)	\$41,169 -- \$15,781 (current fiscal yr)
Halpern, E. H07601	A Phase II Open-Label, Nonrandomized Multicenter Trial to Determine the Ability of DMP115 to Improve the Detection of Cancer in Subjects Referred for Transrectal Ultrasound of the Prostate	DuPont Pharmaceuticals	09/10/99 - 06/30/01	\$168,800 -- \$93,346 (current fiscal yr)	\$42,200 -- \$23,336 (current fiscal yr)	\$211,000 -- \$116,682 (current fiscal yr)
Halpern, E. H09701	Contrast-Enhanced Transrectal Ultrasound Imaging of the Prostate	Nycomed Amersham	11/15/99 - 11/14/00	\$35,484 -- \$13,307 (current fiscal yr)	\$8,871 -- \$3,327 (current fiscal yr)	\$44,355 -- \$16,634 (current fiscal yr)
Halpern, E. H16201	A Phase IIIb, Open-Label, Non- Randomized, Multicenter Trial to Assess the Ability of DMP115 Contrast Enhanced Ultrasound Imaging to Correctly Detect and Characterize Liver or Kidney Pathology	DuPont Pharmaceuticals	02/01/00 - 01/31/01	\$11,900 -- \$6,942 (current fiscal yr)	\$2,600 -- \$1,517 (current fiscal yr)	\$14,500 -- \$8,459 (current fiscal yr)
Lev-Toaff, A. D98101	Ultrasound Studies Using SonoRx	Bracco Diagnostics	11/01/98 - 06/30/02	\$98,720 -- \$26,924 (current fiscal yr)	\$24,430 -- \$6,663 (current fiscal yr)	\$123,150 -- \$33,587 (current fiscal yr)
Levin, D. 081-30000-D29901	Support for Imaging Research	DuPont Pharmaceuticals	05/01/91 - 04/30/01	\$1,156,605 -- \$96,384 (current fiscal yr)	\$289,151 -- \$24,096 (current fiscal yr)	\$1,445,756 -- \$120,480 (current fiscal yr)

Liu, J. A48701	Nonvascular Applications of the AcuNav Ultrasound Catheter	Acuson Corporation	11/06/00 - 06/30/01	\$15,850 --- (current fiscal yr)	\$3,963 --- (current fiscal yr)	\$19,813 --- (current fiscal yr)
Mitchell, D. H05201	A Multicenter, Randomized, Open-Label Study to Evaluate the Safety and Dose-Related Efficacy of Opti-Mark Compared with Magnevist in Identifying Lesions in the Body	Mallinckrodt, Inc.	06/10/99 - 12/30/00	\$45,879 --- (current fiscal yr)	\$11,470 --- (current fiscal yr)	\$57,349 --- (current fiscal yr)
Mitchell, D. H14401	Multicenter, Open-Label Study of Gd-EOB-DTPA with a Single IV Injection (25umol/kg BW) in Patients with Known or Suspected Focal Liver Lesions	Berlex Laboratories	01/01/00 - 06/30/01	\$71,148 --- (current fiscal yr)	\$17,412 --- (current fiscal yr)	\$88,560 --- (current fiscal yr)
Nazarian, L. D92301	New High Resolution Ultrasound System for Evaluating the Skin and Superficial Soft Tissue	Longport, Inc.	09/01/98 - 12/31/00	\$7,400 --- (current fiscal yr)	\$1,850 --- (current fiscal yr)	\$9,250 --- (current fiscal yr)
Needleman, L. D84601	A Phase III, Multicenter Crossover Trial to Determine the Ability of DMP-115 Contrast Enhanced Imaging to Provide Additional Diagnostic Information in Comparison to Unenhanced US Imaging in Patients Referred for Diagnostic US of the Liver and Kidney	DuPont Pharmaceuticals	11/19/97 - 06/30/01	\$29,907 --- (current fiscal yr)	\$7,227 --- (current fiscal yr)	\$37,134 --- (current fiscal yr)
Needleman, L. H09901	Contrast-Enhanced Ultrasound Imaging of the Liver Using Sonazoid (NC-100100) : Phase II, Open-Label Feasibility Study in Subjects with Known Focal Solid Liver Disease, Using Pulse/Phase Inversion Technique in the Contrast-Enhanced Phases	Nycomed Amersham	11/15/99 - 11/14/00	\$30,452 --- (current fiscal yr)	\$7,613 --- (current fiscal yr)	\$38,065 --- (current fiscal yr)

Needleman, L. H30701	Contrast-Enhanced Ultrasound Imaging of the Liver with Intravenous Sonazoid (NC100100, Powder for Injection) for Identification of Lesions. A Phase 2 Dose-Finding, Multicentre, Randomised, Double-Blind Study in Subjects with Known Extrahepatic Cancer and Suspicion of, or Known, Liver Metastases.	Nycomed Amersham	05/01/01 - 04/30/02	\$79,260 --- \$13,210 (current fiscal yr)	\$19,390 --- \$3,232 (current fiscal yr)	\$98,650 --- \$16,442 (current fiscal yr)
Sullivan, K.	A Randomized Double Blind Trial Comparing the Efficacy and Safety of Enoxaparin 30mg BID and Enoxaparin 40mg QD with Sodium Heparin 5000 IU BID all Administered Subcutaneously for a Maximum of 14 Days, as Prophylaxis of Venous Thromboembolic Disease after Major Trauma	Aventis Pharmaceuticals	03/15/00 - 03/15/02	\$34,000 --- \$34,000 (current fiscal yr)	\$8,500 --- \$8,500 (current fiscal yr)	\$42,500 --- \$42,500 (current fiscal yr)
<b>TOTAL INDUSTRIAL FUNDING CURRENT YEAR</b>						
				\$3,107,633 --- \$666,877 (current fiscal yr)	\$786,589 --- \$169,054 (current fiscal yr)	\$3,894,222 --- \$835,931 (current fiscal yr)
<b>TOTAL FUNDING</b>						
				\$8,118,161 --- \$1,747,939 (current fiscal yr)	\$2,956,948 --- \$588,841 (current fiscal yr)	\$11,075,109 --- \$2,336,780 (current fiscal yr)



**TABLE 2**

Pending Grants  
07/01/00 - 06/30/01  
(Report reflects entire award period and first year of award)

**NIH/OTHER FEDERAL GRANTS**

PRINCIPAL INVESTIGATOR	TITLE OF PROJECT	FUNDING SOURCE	FUNDING DATES	DIRECT COSTS	INDIRECT COSTS	TOTAL COSTS FUNDED
Bakic, P.	3-D Breast Parenchymal Pattern Analysis	DOD	07/01/02-06/30/05	\$138,394	\$11,072	\$149,466
Forsberg, F.	Multifrequency Harmonic Array for Contrast Imaging	NIH/SBIR II ASA	08/01/02 - 04/30/03	\$104,417	\$61,606	\$166,023
Forsberg, F. (subcontract) U of P (B. Chance)	Near Infrared (NIR) Detection of Small Sub-Surface Cancers with Targeter Contrast Agents	NIH	01/01/01 - 03/01/01	\$6,460	\$3,811	\$10,271
Forsberg, F. (subcontract) U of P (B. Chance)	2D and 3D Imaging of Contrast Agents in Animal Models of Cancer	NIH	04/01/01 - 03/31/05	\$122,196	\$72,096	\$194,292
Forsberg, F.	System for Excitation Enhanced Ultrasound Contrast Imaging	NIH/SBIR II Spectrasonics	03/01/01 - 02/28/03	\$157,303	\$90,449	\$247,752
<b>FUNDED</b>				\$44,333 (-01 year)	\$3,547 (-01 year)	\$47,880 (-01 year)
Goldberg (subcontract) Drexel (M. Wheatley)	Development of a New Class of Contrast Agents	NIH	01/01/01 - 12/31/05	\$263,044	\$155,196	\$418,240
				\$48,565 (-01 year)	\$28,653 (-01 year)	\$77,218 (-01 year)
				\$17,155 (-01 year)	\$17,155 (-01 year)	\$46,232 (-01 year)
				\$43,609 (-01 year)	\$23,369 (-01 year)	\$66,978 (-01 year)

Halpern, E. <b>FUNDED</b>	Intermittent Ultrasound Imaging of Prostate Cancer	DOD	11/01/00 - 10/31/03	\$372,819	\$219,963	\$592,782
				--- \$132,860 (-01 year)	--- \$78,388 (-01 year)	--- \$211,248 (-01 year)
Halpern, E.	Fingermounted Ultrasound Probe for Prostate Cancer Screening	NIH/SBIR II Creare, Inc.	10/01/01 - 09/30/03	\$29,349	\$17,316	\$46,665
				--- \$2,478 (-01 year)	--- \$1,462 (-01 year)	--- \$3,940 (-01 year)
Liu, J.	3D Endoluminal Ultrasound of Esophageal Cancer	NIH	07/01/01 - 06/30/03	\$200,000	\$89,680	\$289,680
				--- \$100,000 (-01 year)	--- \$47,790 (-01 year)	--- \$147,790 (-01 year)
Liu, J.	Portable Mechanical Imaging Device for Prostate Cancer	NIH/SBIR2 Artann Laboratories	11/01/02 - 10/31/03	\$31,437	\$18,548	\$49,985
				--- \$31,437 (-01 year)	--- \$18,548 (-01 year)	--- \$49,985 (-01 year)
Maidment, A. <b>FUNDED</b>	Quantification of the Benefits of Pendant Mammography	DOD	9/1/01-8/31/02	\$50,000	\$29,500	\$79,500
				--- \$50,000 (-01 year)	--- \$29,500 (-01 year)	--- \$79,500 (-01 year)
Maidment, A.	X-Ray Polarization Imaging	DOD	07/01/02 - 06/30/05	\$297,190	\$133,461	\$430,651
				--- \$149,061 (-01 year)	--- \$46,065 (-01 year)	--- \$195,126 (-01 year)
Nazarian, L.	Speckle Free Ultrasonography of Cartilage and Bone	NIH/SBIR I Imperium	07/01/01 - 12/31/01	\$20,964	\$12,369	\$33,333
				--- \$20,964 (-01 year)	--- \$12,369 (-01 year)	--- \$33,333 (-01 year)
Piccoli, C. <b>FUNDED</b>	Digital Versus Screen- Film Mammography	NIH ACRIN	03/01/01 - 02/28/04	\$644,083	\$153,521	\$797,604
				--- \$299,701 (-01 year)	--- \$67,425 (-01 year)	--- \$367,126 (-01 year)

Piccoli, C. (subcontract) Inst. for Mammo Research ( B. Galkin)	A Urine Test Supplemental to Mammography to Reduce the Number of Negative Breast Biopsies	DOD Palatin Technologies	07/01/02 - 06/30/05	\$11,458 \$3,707 (-01 year)	\$6,760 \$2,187 (-01 year)	\$18,218 \$5,894 (-01 year)
Thakur, M. (subcontract) U of P (R. Murali)	Novel Approaches to Cancer Therapy Receptor Mediated Cancer Therapy	NIH	12/1/01 - 11/30/06	\$342,615 \$64,583 (-01 year)	\$202,143 \$38,104 (-01 year)	\$544,758 \$102,687 (-01 year)
Thakur, M.	A Novel Approach to Radionucleotide Therapy	DOD	11/01/01 - 10/31/04	\$373,893 \$124,916 (-01 year)	\$220,597 \$73,700 (-01 year)	\$594,490 \$198,616 (-01 year)
Thakur, M.	Development of Novel Imaging Techniques	NIH (R21/R33)	12/01/05 - 11/30/05	\$1,004,225 \$99,549 (-01 year)	\$588,115 \$58,734 (-01 year)	\$1,592,340 \$158,283 (-01 year)
<b>TOTAL NIH GRANT FUNDING</b>				\$4,169,847	\$2,086,203	\$6,256,050
<b>TOTAL FIRST YEAR NIH FUNDING</b>				\$1,355,717 (-01 year)	\$750,807 (-01 year)	\$2,106,524 (-01 year)

**Pending Grants**

07/01/00 - 06/30/01

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

**FOUNDATION/NON-PROFIT ORGANIZATION GRANTS**

PRINCIPAL INVESTIGATOR	TITLE OF PROJECT	FUNDING SOURCE	FUNDING DATES	DIRECT COSTS	INDIRECT COSTS	TOTAL COSTS FUNDED
Carrino, J.	Development and Use of a Prediction Rule to Differentiate Benign from Malignant Vertebral Bone Marrow Edema Patterns by MR Imaging	GE-AUR Radiology Research Academic Fellowship	07/01/01 - 06/30/03	\$130,000	\$0	\$130,000
Nazarian, L.	Contrast Enhanced Ultrasound Monitoring of Angiogenesis in Human Melanoma Xenografts	Radiologic Society of North America	07/01/01 - 06/30/02	\$23,274	\$0	\$23,274
<b>FUNDED</b>				\$23,274 (-01 year)	\$0 (-01 year)	\$23,274 (-01 year)
			<b>TOTAL NON-PROFIT FUNDING</b>	\$153,274	\$0	\$153,274
			<b>TOTAL FIRST YEAR NON-PROFIT FUNDING</b>	\$88,274 (-01 year)	\$0 (-01 year)	\$88,274 (-01 year)

**Pending Grants**

07/01/00 - 06/30/01

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

**INDUSTRIAL GRANTS**

PRINCIPAL INVESTIGATOR	TITLE OF PROJECT	FUNDING SOURCE	FUNDING DATES	DIRECT COSTS	INDIRECT COSTS	TOTAL COSTS FUNDED
Bonn, J.		IMPRA	To be determined	\$136,782	\$33,821	\$170,603
Forsberg, F.	Evaluation of Vuesonix Volume Flow Measurements	Vuesonix	To be determined	\$68,391 (-01 year)	\$16,911 (-01 year)	\$85,302 (-01 year)
Intenzo, C.	An Open-Label, Multicenter Clinical Study to Evaluate the Efficacy and Safety of Technetium Tc99m LeuTech Scintigraphy for the Detection of Abscess in Post-Surgical Patients	Palatin Technologies	11/01/00 - 10/31/01	\$40,051 (-01 year)	\$10,013 (-01 year)	\$50,064 (-01 year)
Mitchell, D.	A Phase III Multicenter Study to Evaluate the Safety and Efficacy of Multi-enhance-Enhanced MRA in the Assessment of Abdominal and Pelvic Arteries as Compared to Unenhanced MRA Using DSA as the Reference Standard	Bracco Diagnostics	To be determined	to be determined	to be determined	to be determined
Mitchell, D.	A Multicenter, Comparative, Two-Arm Phase 3 Study to Determine the Safety and Efficacy of MS-325-Enhanced MRA for Evaluation of Aortoiliac Occlusive Disease in Patients with Known or Suspected Peripheral Vascular Disease or Aortic Aneurysm	EPIX Medical, Inc.	To be determined	\$37,560	\$9,390	\$46,950
				\$37,560 (-01 year)	\$9,390 (-01 year)	\$46,950 (-01 year)
				to be determined	to be determined	to be determined
				to be determined (-01 year)	to be determined (-01 year)	to be determined (-01 year)

Needleman, L.	Evaluation of a System for Laser Interstitial Thermal Therapy	Surgical Laser Technologies	To be determined	\$12,152	\$3,038	\$15,190
				----- \$12,152 (-01 year)	----- \$3,038 (-01 year)	----- \$15,190 (-01 year)
Thakur, M.	Intracellular Radionucleotide Therapy	Nihon Medi-Physics	10/01/01-09/30/02	\$159,782	\$39,945	\$199,727
				----- \$159,782 (-01 year)	----- \$39,945 (-01 year)	----- \$199,727 (-01 year)
			<b>TOTAL INDUSTRIAL FUNDING</b>	\$386,327	\$96,207	\$482,534
			<b>TOTAL FIRST YEAR INDUSTRIAL FUNDING</b>	----- \$317,936 (-01 year)	----- \$79,297 (-01 year)	----- \$397,233 (-01 year)
			<b>TOTAL PENDING FUNDING</b>	\$4,709,448	\$2,182,410	\$6,891,858
			<b>TOTAL FIRST YEAR PENDING FUNDING</b>	----- \$1,761,927 (-01 year)	----- \$830,104 (-01 year)	----- \$2,592,031 (-01 year)