2000

Department of Radiology-Annual Executive Summary Report-July 1, 1999 to June 30, 2000

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Thomas Jefferson University

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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

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

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

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

1999-2000

DEPARTMENT CLINICAL DIVISIONS AND DIRECTORS

ACADEMY IMAGING
Catherine W. Piccoli, M.D.

BODY CT
Richard J. Wechsler, M.D.

BREAST IMAGING
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.

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.

QUALITY ASSURANCE COMMITTEE
Paul Spirn, M.D.

COMPUTER COMMITTEE
Victor Sarro

CONTRAST COMMITTEE
Richard J. Wechsler, M.D.
RADIOLOGY DEPARTMENT FACULTY RANK
1999-2000

PROFESSORS
Barry B. Goldberg, M.D.
David Karasick, M.D.
Alfred B. Kurtz, M.D.
David C. Levin, 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.

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

CLINICAL PROFESSOR
Stephen Karasick, M.D.

ASSOCIATE PROFESSORS
Joseph Bonn, 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.
Anna S. Lev-Toaff, M.D.
Levon Nazarian, M.D.
Laurence Needleman, M.D.
Kevin L. Sullivan, M.D.
Lisa M. Tartaglino, M.D.

RESEARCH ASSOCIATE PROFESSOR
P. Macke Consigny, Ph.D.
Ji-Bin Liu, M.D.

ASSISTANT PROFESSORS
Barbara Cavanaugh, M.D.
Diane M. Deely, M.D.
Susan DeWygnaert, M.D.
W. Scott Enochs, M.D.
David J. Eschelman, M.D.
George A. Holland, M.D.
Michael Eschelman, M.D.
Pamela Johnson, M.D.
Sung M. Kim, M.D.
Andrew A. Maidment, Ph.D.
William B. Morrison, M.D.
Patrick O’Kane, M.D.
Catherine W. Piccoli, M.D.
Ana M. Salazar, M.D.
Sharon R. Segal, D.O.
Rosita M. Shah, M.D.
Susan Trevisan, M.D.

CLINICAL ASSISTANT PROFESSORS
Cindy Isaacson, 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
Jane Hughes, M.D.
Robert Morales, 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]

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

Joel S. Raichlen, M.D., Assistant Professor of Medicine [primary]
   Clinical Associate Professor of Radiology [secondary]

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

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

Ronald J. Wapner, M.D., Professor of Obstetrics and Gynecology [primary]
   Professor of Radiology [secondary]
DEPARTMENT OF RADIOLOGY
David C. Levin, M.D., Chairman

CLINICAL DIVISIONS 1999-2000

Body Computed Tomography

Directed by Richard J. Wechsler, M.D.
Drs. Rick Feld, Ethan Halpern, George Holland,
Pamela Johnson, Alfred Kurtz, Anna Lev-Toaff,
Levon Nazarian, Laurence Needleman, Ana Salazar,
Rosita Shah, Paul Spirn

Breast Imaging/Ambulatory Radiology

Directed by Catherine W. Piccoli, M.D.
Drs. Barbara Cavanaugh, Susan DeWyngaert, Jane
Hughes, Cindy Isaacson, Susan Trevisan, Annina
Wilkes, Elaine Wolk

Cardiovascular/Interventional Radiology

Directed by Geoffrey A. Gardiner, Jr., M.D.
Drs. Joseph Bonn, David Eschelman, Kevin Sullivan

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

Directed by Mark E. Schweitzer, M.D.
Drs. Diane Deely, Cindy Isaacson, David Karasick,
Stephen Karasick, Anna Lev-Toaff, William
Morrison, Ana Salazar, Rosita Shah, Paul Spirn,
Richard Wechsler

Magnetic Resonance Imaging

Directed by Donald G. Mitchell, M.D.
Drs. Diane Deely, George Holland, David Karasick,
Catherine Piccoli, Mark Schweitzer, William
Morrison

Neuroradiology/ENT Radiology

Directed by Vijay M. Rao, M.D., David P. Friedman, M.D.
Drs. Scott Enochs, Adam Flanders, Michael Hollander,
Robert Morales, Lisa Tartaglino

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,
Pamela Johnson, Alfred Kurtz, Anna Lev-Toaff,
Christopher Merritt, Donald Mitchell, Levon
Nazarian, Laurence Needleman, Patrick O’Kane,
Catherine Piccoli, Sharon Segal, Terri Tuckman,
Annina Wilkes

Health Services Research

Dr. Laurence Parker

Physiological Research

Drs. P. Macke Consigny, Ji-Bin Liu

Radiological Physics

Drs. Flemming Forsberg, Andrew Maidment,
William Shi

Radiopharmaceutical Research

Dr. Mathew Thakur
DEPARTMENT OF RADIOLOGY
HOUSESTAFF ROSTER
1999-2000

RESIDENTS

FIRST 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.

SECOND YEAR RESIDENTS
Jaime Checkoff, M.D.
Dennis C. Lin, M.D.
Barry J. Livstone, M.D.
Douglas Montgomery, M.D.
Jonathan Morgan, M.D.
Aaron Shiloh, M.D.

THIRD YEAR RESIDENTS
Sandra O. Allison, M.D.
Sandip Basak, M.D. (chief resident)
Richard W. Epstein, M.D.
Jennifer K. Fan, M.D.
Andrew Kwak, M.D.
Jennifer D. Tobey, M.D. (chief resident)

FOURTH YEAR RESIDENTS
Glenn Articolo, M.D.
Steven Epstein, M.D.
Angela J. Gessner, M.D.
Antje Greenfield, M.D.
Jeffrey I. Mondschein, M.D.
Jennifer Park, M.D.

Nuclear Medicine
Mohab Alexander, M.D.
Liliya Yanovskaya, M.D.

FELLOWS

US/CT/MRI
Michael Aro, M.D.
Marie Eason, M.D.
Francis Flaherty, M.D.
Monica Huang, M.D.
Eric Korenman, M.D.
Philip Lim, M.D.
Sanjaya Viswamitra, M.D.

CARDIOVASCULAR/INTERVENTIONAL
John Briguglio, M.D.
Huntz H. Liu, M.D.
Kurt H. Wetzler, M.D.
Stephen R. Lowe, M.D.

NEURO/ENT
Anthony Caramico, M.D.
Azam Rizvi, M.D.
Jennifer Villa, M.D.

BODY/NEURO MRI
David Ormond, M.D.
Jeffrey Pan, M.D.
Daniel Rudensky, M.D.
John Thomas, M.D.

BREAST IMAGING
Steven G. Lee, M.D.

BODY MRI
Jeffrey Rueda, M.D.
William Rubenstein, M.D.

MUSCULOSKELETAL
Andrew Haims, M.D.
The turn of the century was accompanied by considerable challenges, just as we have seen in recent years past. Our department has once again operated under a strict mandate to cut costs, in the interests of helping to keep the hospital solvent. At a time when a number of other academic medical centers here in Philadelphia and around the nation are facing huge deficits, it is a source of satisfaction to all of us that Jefferson is still operating in the black – clearly a sign of good management. There are some encouraging signs for the future. One of these has been some relief that the Medicare program has provided from the earlier drastic reimbursement cuts that were introduced in the Balanced Budget Act of 1997. Also, the Jefferson Health System was able to come to more favorable terms than in the past in our negotiations with Independence Blue Cross. In general, payments for hospital and physician services are still not where they ought to be but Jefferson seems to be holding its own, and that is a statement many other academic institutions cannot make.

Our department has accomplished a number of good things in the past year. We expanded our clinical practice through acquisition of several important outside contracts. Our research effort continues to be strong, despite the increasing demands of our busy clinical practice. Our residency program also continues to be strong. In residency recruitment, we had another very successful year. Our six selected candidates came from among the top 22 on our match list. We experienced a tremendous influx of applicants this year, receiving almost 500 for the 6 slots.

At the time of this writing (late July 2000) I am encouraged by several recent developments. Two of our biggest problems have been obsolescence of our clinical equipment and the lack of advanced imaging instruments for research. Closely related to these are financial restrictions that have been placed on the department. With the recent change in the Deanship, I am hopeful that these financial restrictions may be abated somewhat. Also, a recent review of the department’s clinical equipment by ECRI (an outside consulting firm) was strongly supportive of the need to substantially upgrade it. I believe the hospital will take action on their recommendations. In the research sphere, I recently made a proposal to a campus task force on strategic research planning to establish a Jefferson Biomedical Imaging Research Support Center. It would house sophisticated MR instruments and other research equipment that would support NIH-funded research throughout the Jefferson community. These will be discussed in more detail later in this report.

My report will focus upon the following areas: (1) Clinical activities during 1999-2000, (2) Planned new clinical programs, (3) Clinical weaknesses, (4) Research accomplishments, (5) Research weaknesses, (6) Opportunities for extramural research funding, (7) Department administration, (8) Affiliations and interdepartmental activities, (9) Department goals, and (10) Issues for the college, university and hospital. Immediately following my report, Dr. Vijay Rao will present a separate report on our educational programs.

Putting together an annual report like this entails a tremendous amount of work compiling lists, typing, formatting, etc. Much of this was carried out by Andrea Maitino, Dara Killion, and Rae Persick, and I am very appreciative of their help.
CLINICAL ACTIVITIES

Our TJUH procedure volume remained relatively flat during 1999-2000. This was largely because we are "maxed out" in several important areas – especially MRI, CT and mammography. However, there was continued growth in our outside contracts, which as a group brought us $2,226,000 in professional revenues during the year. The total professional revenues of our entire practice were the highest they've ever been. At a time when many other academic and community hospital radiology departments are under financial pressures, this is something we can feel very good about.

In the general diagnostic division, we greatly expanded our spine interventional service under the leadership of Dr. William Morrison, one of our new faculty members. He introduced such therapeutic procedures as epidural steroid injections, nerve blocks, discography, and facet joint injections. We were able to redesign and expand our musculoskeletal reading room on 3 Gibbon. This was badly needed, as the former room was extremely cramped and unattractive. The new room is more than double the size and allows for much more efficient reading and consultation. We also installed a new multipurpose radiographic room in Core 2.

In the Breast Imaging Center, the major changes were in personnel. Dr. Cathy Piccoli took over as division director and we also were able to recruit a number of excellent new faculty members. In the order in which they joined us, they are Drs. Susan DeWyngaert, Susan Trevisan, Barbara Cavanaugh, and Steven Lee. Dr. Piccoli has done an excellent job of stabilizing, reorganizing and recruiting.

Some very important changes occurred in our CVIR division. Following the opening of our third procedure room last year, we completely replaced the equipment in our two existing angio labs – a badly needed change since our old equipment was literally falling apart. All three of our angio rooms are now modern and all-digital. The quality of the digital imaging is outstanding and the equipment offers such advantages as bolus chase and rotational capabilities. The availability of a holding unit immediately adjacent to the CVIR area (shared with cardiology) is a major advantage, in that it allows us to monitor patients efficiently after they have completed their procedures. The availability of three procedure rooms has allowed us to expand our interventional radiology services. One of the new services now being performed in rapidly increasing numbers is declotting of dialysis access grafts. An important new service is the placement of aortic stent grafts in treating abdominal aortic aneurysms. These complex procedures are jointly performed by our interventional radiologists and the vascular surgeons. Initial results are very promising. Under the leadership of Dr. Joseph Bonn, we have greatly expanded our use of uterine artery embolization in women with fibroids. We performed almost 70 of these procedures last year. Another expanding service is hepatic artery embolization, under the leadership of Dr. Kevin Sullivan.

In neuroradiology/head and neck radiology, we extended the scanning hours at the Wills Eye Hospital MRI unit. We began or expanded examinations such as perfusion and diffusion MRI, dynamic gadolinium-enhanced MR angiography, 3-D imaging of airways (virtual laryngoscopy), and CT-guided biopsy of head and neck lesions. We continued to expand CT angiography of intracranial and extracranial arteries of the leadership of Dr. Lisa Tartaglino. Dr. Adam Flanders spearheaded the start of a relationship between our department and Stentor, a company with a promising new web-based method of distributing images to PCs of referring physicians and others. This offers the hope of a better and cheaper image distribution mechanism than we had initially envisioned. It remains to be seen whether our relationship with Stentor will become a long term one.

In our ultrasound division, Dr. Lev Nazarian and his colleagues have been developing a musculoskeletal ultrasound service with new diagnostic and therapeutic applications. They have begun doing percutaneous tenolysis procedures under ultrasound guidance, as well as percutaneous injections of
steroids and anesthetic agents which have helped promote healing of tendon injuries. The clinical results so far have been favorable and it appears that the service could rapidly expand in future years. We have introduced or expanded several other interesting new technologies, including real time 3-D imaging, harmonic imaging, photopic imaging, and compound imaging. Growth was seen in radiofrequency-induced tumor ablation (RITA) and other ultrasound-guided interventions. We also began performing direct thrombin injections for treatment of pseudoaneurysms, and using ultrasound guidance for cryoablation of renal tumors in the OR. Some new equipment was loaned to us by Siemens and GE and we were able to upgrade two of our ATL scanners, all of which allowed us to carry out both clinical work and research on high resolution compound imaging.

In nuclear medicine, we acquired our long-awaited DEXA scanner and many of these studies are now performed on a daily basis. Other new studies included brain SPECT imaging in complex regional pain syndromes, bone SPECT in ankylosing spondylitis, imaging of poorly-differentiated thyroid carcinoma with somatostatin receptor analogs, and using these same analogs to monitor therapy in non-small-cell lung cancer.

As noted above, our outside contracts were a very important part of our practice. Not only do they bring in revenue, but they also contribute much interesting teaching material and give our residents and fellows experience with a variety of different types of equipment. Two new outside contracts were added this past year – the Marlton MRI unit (owned by Medical Resources) at the beginning of the year, and Doylestown Open MRI (owned by a private physician group) near the end of the year. As always, the assumption of these new outside relationships pose considerable logistic challenges, but we are gratified to be able to extend our practice in this manner. In addition to these two facilities, our other outside contracts include Langhorne MRI and Bala MRI (both owned by CMI), Academy Imaging Center (owned by Medical Resources), Open-Sided MRI (jointly owned by TJUH and MMR), and Wills Eye Hospital. This was the first full year of operation of the open-sided MRI unit and it is quite notable that of the 23 centers operated around the country by MMR, we are already their second highest in procedure volume. Significant upgrades to the MRI and CT scanners were incorporated at Academy Imaging and a similar upgrade was installed at the Langhorne MRI.

**PLANNED NEW CLINICAL PROGRAMS**

The most important new development has been the evaluation of the department's equipment and facilities conducted in July 2000 by an outside technology consulting company, ECRI. For the last several years, Victor Sarro and I have been urging the hospital administration to replace and/or modernize much of our equipment, but limitation in funding has been a major problem. It was gratifying that ECRI basically agreed with all our recommendations. They have identified capital budget needs for radiology of approximately $13.5 million over the next three years. If their recommendations are carried out, marked improvement in our clinical equipment and capabilities will result. The recommendations included upgrading to multidetector CT, installing a new neuro angio room, upgrading our MRI units, upgrading or adding new ultrasound scanners, consolidating and modernizing our nuclear medicine cameras, adding new fluoroscopy equipment, and replacing some of our older mammography machines. In addition, they recommend the installation of a new radiology information system and transitioning of our x-ray units to all-digital.

Some of our more detailed new clinical plans for this year include: In the general diagnostic division, we plan to start performing vertebroplasty. In the Breast Imaging Center, we are currently renovating a large new space on the third floor of the MOB, which will become our new mammography screening center. Two new mammography units will be added to the two existing units, and we will be stationing a breast imaging radiologist directly in the screening center to read those studies online and consult with patients. This is a service we have never been able to offer in the past, but it will be a great convenience
and source of support to women undergoing screening mammography. Once the third floor renovation is completed, the diagnostic portion of our BIC in the MOB basement will also be renovated and enlarged. In the CVIR division no new equipment is needed, but Dr. Gardiner is working in conjunction with the vascular surgeons on a plan to develop a joint Vascular Disease Treatment Center. This is something that is being done in a number of other academic medical centers around the country, and we hope ours will lead to a mutually agreeable and cooperative relationship with our vascular surgery colleagues.

In our neuroradiology division, there are plans to expand functional MRI as new software becomes available. However, much of this will depend upon the availability of MR physics support, which we currently do not have. They also plan to expand CT-guided fine needle aspiration and biopsy of head and neck masses and 3-D virtual laryngoscopy. Dr. Flanders and others will continue working with Stentor to expand our efforts at electronic image distribution to PCs in referring physician offices and elsewhere on the campus.

In our ultrasound division we plan to expand our Canon PACS to incorporate all of ultrasound. We expect to see continued expansion in a number of areas mentioned earlier, including percutaneous tenolysis and tendon repair, 3-D ultrasound, RITA procedures, and sonohysterography. Dr. Anna Lev-Toaff and her colleagues plan to begin routine clinical use of oral contrast material in abdominal ultrasound.

A major new development in MRI is the addition of a new 1.5T magnet in the Rothman Institute. This is a badly-needed expansion of our MRI capability, since our current backlogs are two weeks and this is simply not an acceptable situation for many patients and referring physicians. At Wills Eye Hospital, we will be expanding the hours of the MRI unit there.

In Nuclear Medicine, a major addition is due shortly, with the arrival of our molecular coincidence detection camera. This will allow us to use 18-fluoro-deoxy-glucose (FDG) for PET-type imaging. This technique is now becoming more widely used for imaging lung cancer, lymphoma, melanoma, colorectal carcinoma, myocardial ischemia, and mapping epileptic foci.

**CLINICAL WEAKNESSES**

As mentioned earlier, the ECRI report pointed out a major clinical weakness of our department—obsolescence of much of our equipment, and the related problem of not enough equipment in certain areas. Some years ago, the “expert” pundits on the national healthcare scene predicted that utilization of diagnostic imaging would diminish as managed care tightened up on utilization of medical services. That has proven to be nonsense, and as the capabilities of modern imaging expand, the demand for our services has never been stronger. Serious backlogs have developed in MRI, CT, and mammography. These backlogs have developed despite the fact that we have lots of equipment in all these areas. We will work with the hospital administration and hope to be able to alleviate the problem. This will not only require large capital expenditures, but we will also have to solve perhaps an even more vexing problem—a shortage of space on the campus for new imaging facilities.

Another of our problems is that we have not been able to generate our reports as quickly as we should. This relates in part to delays in transcription, which have been caused by inefficiencies of some of our outside transcription services. Victor Sarro and Lisa Massanova have been working diligently on this problem and a number of independent outside transcriptionists have been retained. However, it is difficult to find individuals to do this work in a full employment economy such as we are now experiencing.
Our practice was short-staffed in several areas this past year, including neuroradiology, breast imaging, and musculoskeletal radiology. Although staffing in CVIR remained stable, the workload in that division expanded to the point where it was almost impossible for the four of them to keep up. [I might point out that we had the same four staff slots in CVIR this past year that we had when I came here 14 years ago, despite the fact that the workload has tripled and the procedures become more complex.] We have added new faculty this coming year in all these areas. We subcontract our pediatric radiology to the group at the duPont Hospital for Children; they were also short-staffed this past year and had to cut down on the amount of coverage they provided. In addition to physician shortages, there is a shortage of trained technologists. This has affected almost every area of our department.

RESEARCH ACCOMPLISHMENTS

Our department once again had a very good year in terms of research productivity. This is a great tribute to the perseverance and dedication of our faculty, given that there has been a continuously increasing clinical caseload over the past several years. During parts or all of the last academic year, department investigators were involved in 67 outside grants or contracts – 19 from NIH or other federal agencies, 11 from foundations or nonprofit medical organizations, and 37 from industry. The total expenses of these 67 grants over their entire lifetime was slightly over $11 million (including both direct and indirect). For the 1999-2000 year itself, our total grant support was $2,122,023 in direct funding and $708,160 in indirect, for a total of $2,830,183. We changed our internal grant accounting conventions this year, so it isn’t possible to directly compare with previous years. Ultrasound was our most prominent area of grant activity, with total funding of approximately $1,755,000. Drs. Barry Goldberg and Flemming Forsberg and their colleagues in the ultrasound division deserve great credit for this accomplishment. Other areas of grant support in the department included breast imaging ($330,000 in total funding); CVIR ($287,000); radiopharmaceutical development under Dr. Thakur ($203,000); body and musculoskeletal MRI ($131,000); and the duPont film grant which I negotiated years ago ($124,000).

We again had a very prominent role at the RSNA – the largest and one of the most competitive medical meetings in the world. Radiology faculty or trainees authored or co-authored 61 presentations, which was about the same as the previous year. The RSNA is a highly competitive meeting, with an acceptance rate of only about 35% of submissions, so this is an excellent indication of the quality and breadth of our research. Very few other academic radiology departments around the country can match this record. We also had a very solid presence at the AIUM, the largest ultrasound meeting in the world.

Department researchers published 233 journal articles, book chapters, and abstracts this past year. Although this total is down somewhat from previous years, it still represents an impressive body of work. Later on in this annual report, we also list the very large number of presentations delivered by faculty members at national and international scientific meetings or as invited speakers at other academic institutions.

In ultrasound, Dr. Kurtz completed his NIH-funded study comparing various imaging modalities in staging advanced ovarian carcinoma. This important project involved a consortium of academic radiology departments, and the work was published. Dr. Forsberg was very active; he currently has three funded federal grants and several industry-supported research projects under way. His research focuses partly on the use of gas-filled microbubbles as ultrasound contrast agents, and spans the spectrum from basic science (e.g. subharmonic imaging and new multipulse contrast imaging techniques) to applied clinical research (e.g. 3-D power Doppler imaging of breast tumors). He authored or co-authored 11 published papers this past year. Dr. Halpern published on his initial experience with contrast-enhanced sonography of the prostate, and compared the use of gray scale, color, and power Doppler sonography in detecting prostate cancer. Christopher Merritt, M.D., a widely respected figure in ultrasound, joined our faculty and will focus on research and teaching. He will work with our very strong team of full-time
ultrasound researchers, which includes Drs. Forsberg, Liu, Shi, and several research technologists and coordinators. Dr. Merritt has been awarded a large NIH subcontract for evaluating ultrasound elastography. Dr. Liu completed his NIH grant-supported work on tumor evaluation by endoluminal 2-D and 3-D ultrasound and published several papers describing his results. Dr. Lev-Toaff was quite active in research as well; she published the results of a phase II clinical trial of a new oral contrast agent for sonography, and also a study of 3-D multiplanar ultrasound for fetal gender assessment. Dr. Feld published a paper on the use of an end-fire ultrasound probe to guide cryoablation of renal masses; and he also continued working on a study of the use of enoxaparin to prevent DVT in spinal cord injury patients. Dr. Nazarian studied the safety and efficacy of ultrasound-guided random core liver biopsies for diagnosing diffuse liver disease.

In the general diagnostic division, Dr. Mark Schweitzer continued his extraordinary productivity with 25 papers in print or in press this past year. On 22 of them, he was either senior author or first faculty author on a paper produced by a fellow or resident. He obviously is an outstanding mentor for young radiologists. Dr. William Morrison joined our faculty in the musculoskeletal section and his productivity was also very impressive. He published 12 papers as author or co-author. In the chest section, Dr. Shah published her work on histologic subtypes and dominant CT patterns in bronchioloalveolar cell carcinoma, and another paper on the effect of HIV seropositivity on pneumococcal pneumonia patients requiring hospitalization.

In breast imaging, Drs. Maidment and Piccoli continued to accrue cases for their NIH-funded study on the clinical evaluation of digital mammography. The two of them, along with Dr. Merritt, completed a study of compound ultrasound imaging of the breast. They also continue to work on Dr. Maidment’s DOD-funded 3-D analysis of breast microcalcifications.

In CVIR, Dr. Bonn served as principal core lab investigator for the clinical trial of the Vanguard endovascular stent graft, and also as principal investigator of a phase II clinical trial of the Symphony iliac stent. Dr. Sullivan was involved in core lab projects involving the Impra dialysis graft and the use of low molecular weight heparin for prophylaxis against DVT in trauma patients. He also began working on a very interesting project — the experimental immunoembolization of hepatic metastases using ethiodol/granulocyte-macrophage colony-stimulating factor. Dr. Gardiner continued his ongoing work on the STAR Registry; his team completed site visits for validation of enrollment data and continued collecting patient follow-up data.

In body MRI, Dr. Mitchell began working on one of the early protocols sponsored by the NIH-funded American College of Radiology Imaging Network (ACRIN). This particular project involves imaging of cancer of the cervix. He was also a collaborating investigator on a multicenter clinical trial of mangafodipir trisodium as a liver MR imaging agent. He and Dr. Holland worked with several of our foreign visiting research fellows on MR studies of liver and biliary tract lesions, ovarian vein abnormalities, renal cysts, and cirrhosis. Dr. Holland submitted for publication a study of functional MR cholangiography using breathhold ultrafast 3-D spoiled gradient echo following administration of mangafodipir trisodium.

In nuclear medicine, supported by 2 NIH and 3 industrial grants, Dr. Thakur continued his research in developing radiolabeled peptides for imaging tumors and thromboembolism, and initiated a study for using lipid-soluble radioactive compounds for cancer therapy. In June 2000 he was awarded the prestigious Georg de Hevesy award from the Society of Nuclear Medicine for outstanding achievements using radioactive material in nuclear medicine. He published seven excellent papers in three of the leading nuclear medicine journals on a variety of uses of radiolabeled compounds. Dr. Intenzo was principal investigator on an open label multicenter clinical trial of 99m Tc LeuTech for detecting abscesses. This compound was developed by Dr. Thakur and he was awarded a patent on it.
In neuroradiology, Dr. Rao developed a new CT-based classification of orbital floor fractures and correlated it with postoperative clinical outcomes. She also worked with members of the head and neck surgery department on a study of the frequency of cochlear enhancement on MRI in patients with autoimmune sensorineural hearing loss. She and Dr. Enochs demonstrated the utility of dynamic gadolinium-enhanced MR in evaluating salivary gland tumors. Dr. Friedman published a paper correlating the MR and clinical findings following stereotactic radiosurgical pallidotomy and thalamotomy with the gamma knife. He also studied the role of MRI in following up patients with medically refractory trigeminal neuralgia treated with stereotactic radiosurgery.

In body CT, Dr. Nazarian compared contrast-enhanced and nonenhanced CT in sizing colorectal carcinoma liver metastases. He also worked with one of our former fellows on a study of the frequency and significance of filling defects in the common femoral and common iliac veins on CT during the portal-dominant phase. Dr. Halpern completed a study comparing CT angiography with MR angiography for preoperative evaluation of renal donors; this paper will be published shortly.

Finally, Drs. Rao, Parker, and I continue to expand our efforts in Health Services Research. Dr. Rao completed studies of trends in utilization of neuroimaging and regional variations in its utilization. Utilization variations in different parts of the country have been demonstrated in other parts of medical practice, but her study is the first to do so in radiology. I published a study of practice patterns in emergency department ultrasound and another which compared participation by radiologists, cardiologists and vascular surgeons in performing percutaneous peripheral vascular interventions. Dr. Parker advised me recently that he collaborated on no fewer than 27 abstracts submitted to the RSNA this year, many of them dealing with health services research. We are probably the only academic department in the country now actively involved in studying practice patterns and regional variations in radiology. A number of our other faculty members and residents have become involved. We are studying areas such as cardiac nuclear medicine, treatment of thyroid disease with radioiodine, cardiovascular imaging, ultrasound, body MR and CT, percutaneous spinal interventions, breast biopsy, endovascular neurointerventions, and carotid imaging. We have also become active in technology assessment projects. Some of the modalities we have compared include contrast enhanced ultrasound vs mammography, contrast enhanced ultrasound vs CT and MRI of the pancreas, and enhanced vs nonenhanced CT for evaluation of abdominal pain. Dr. Intenzo recently submitted a paper on cost-effectiveness of stress radionuclide myocardial perfusion imaging in patients seen in an acute chest pain center in Jefferson’s emergency department. Dr. Schweitzer and a former Jefferson medical student published the results of a cost-effectiveness analysis of pelvic radiography in blunt trauma patients. Dr. Eschelman published an interesting study demonstrating that research productivity of radiology faculty members is inversely related to clinical productivity, as measured by total professional RVUs.

RESEARCH WEAKNESSES

Despite the many positive accomplishments of the department in research this past year, we are facing several disconcerting weaknesses. First, the University has limited our access to our overage fund reserves. We have been told that there are new accounting rules that restrict us to spending only the current fiscal year’s inflow to the overage fund. On top of that, a further reduction in allowable expenditures of $500,000 was imposed upon us for this fiscal year by former Dean Gonnella. The reason for these limitations is that the Medical College is currently operating at a deficit and the University administration has decided that expenditures must be reduced in an effort to eliminate this deficit. This creates a very difficult situation for our department’s research effort. With such severe limitations on expenditures and no access to our overage fund reserves, it is becoming almost impossible for us to maintain the infrastructure we need to mount an effective research effort. It also limits our ability to hire...
people who are needed as part of our research team. I have objected to this policy, and it remains to be seen what will happen.

A second research weakness is related to the department's clinical equipment in the hospital. As noted earlier, some of it has become obsolete, and some of the rest is outdated and in need of upgrading. Because much of radiology research is related to clinical trials, we depend on our imaging instruments to enable us to do cutting edge research. A good example is CT. Many other high quality university hospitals are now installing multidetector CT. Two of the most exciting new areas in CT are CT angiography and 3D reconstruction. To do advanced research and development in these areas requires multidetector CT. Since we don't have this equipment yet, we obviously aren't able to participate in those aspects of radiological research. I am hoping that as a result of the ECRI report (mentioned earlier), the hospital administration and Board of Trustees decide to move forward expeditiously with modernization of the department.

In this report last year, I discussed our plans to recruit a new MRI physicist. That position is still unfilled, and this has obviously led to a void in our research efforts this past year. Although a number of our faculty have produced good clinical research pertaining to MRI (especially in body and musculoskeletal MR), the absence of an MR physicist seriously impairs our ability to do translational research in MRI. At this moment, we have several good candidates under consideration, but a major problem is the difficulty in obtaining startup funding for a new person. This relates directly to the lack of access to our overage fund reserves discussed above.

Several of our divisions have not been as productive as in previous years – particularly neuroradiology and CVIR. This is a function of one of the research weaknesses I mentioned last year and which certainly applied during the 1999-00 academic year – our workload has grown so heavy (especially due to our many outside contracts) that it has become difficult for faculty to find time to conduct research. This is especially true in the neuro and CVIR divisions, where RVUs per faculty member are considerably above the norm for other academic radiology departments. I mentioned in last year's annual report that we might have to recruit new faculty, and that eventuality has come to pass. We are adding new faculty members this year to both these divisions. With additional help in the clinical area, I certainly hope and expect to see increased research productivity from both these groups.

Last but not least, our department lacks a sophisticated imaging research facility, containing advanced imaging instrumentation. More about this in the next section.

OPPORTUNITIES FOR EXTRAMURAL FUNDING

Acting Dean Thomas Nasca recently convened a task force on strategic planning for research at Jefferson Medical College. The task force held a number of meetings and received input from many different sources around the campus. Among these inputs was a proposal I made to them to establish a Jefferson Biomedical Imaging Research Support Center. This facility would support funded research that involves the use of imaging in many other Jefferson departments, as well as our own. The proposal included a 3T whole body MRI unit, two smaller bore higher field magnets for animal and tissue analysis, a surface coil laboratory, an ultrasound laboratory to provide extended capability in basic physics of ultrasound, a PET scanner, an image fusion laboratory, an optical coherence tomography unit, and an x-ray physics laboratory. This is obviously an ambitious and costly program; however, there was widespread support from other departments who recognize that much of their own research requires sophisticated imaging capability that could be provided through the establishment of such a center. The task force is currently preparing a report to go to Dr. Brucker and the Board of Trustees. I was very pleased to note that the draft of this report is strongly supportive of the need for a multidisciplinary imaging research facility.
The draft contains the following sentence among its summary recommendations: “The need for imaging facilities was made clear by many faculty and the committee recommends creating an imaging center which would serve faculty campus-wide”. If the Board of Trustees approves this plan and the funding and space can be made available (presumably in the Western Union or new Kimmel Cancer Center buildings or both), our outlook for obtaining extramural funding will be greatly improved.

In the shorter term, Table 2 of the Appendix shows our current list of pending grant proposals. There are 17 federal, 3 foundation, and 4 industrial grants in this “pending” category. I am pleased to note that among this list, funding has been approved for 2 proposals by Dr. Forsberg, one by Dr. Liu, one by Dr. Maidment, and one by Dr. Thakur. Another proposal by Dr. Goldberg in the area of international education has been funded by the Open Society Institute. Investigators in the department are constantly submitting new grant proposals, and by the time this report is published, Table 2 will already be out of date.

The American College of Radiology Imaging Network (ACRIN) is a national, NIH-funded, multi-institutional research group set up to analyze the use of imaging technologies in many different forms of cancer. Sites must be approved for participation, and our department is one of 24 approved sites nationwide. Drs. Piccoli and Maidment are heading Jefferson’s participation in a national trial of digital vs. screen-film mammography, administered through ACRIN. Dr. Mitchell is participating in another ACRIN study on imaging of cervical cancer. Several other proposal have been submitted.

AFFILIATIONS AND INTERDEPARTMENTAL ACTIVITIES

The nature of radiology is that we interface with most other departments in clinical practice, education, and research. Most clinicians in other disciplines use our services on a daily basis. A visit to almost any of our reading rooms during the day reveals a constant stream of attendings, residents, and medical students from other services coming through to consult with our radiologists on cases they are managing. Our faculty members also participate in formal teaching conferences sponsored by many other clinical departments.

Our relationship with Will Eye Hospital is especially important. With the pending acquisition of Wills by TJUH, we will have the opportunity to integrate the Wills radiology department even more closely into our own from an administrative perspective. The MRI and CT scanners at Wills have been somewhat underutilized in recent years, and as the Jefferson and Wills radiology operations become more closely integrated, we hope to be able to utilize these Wills scanners more effectively to reduce our own serious backlogs. Dr. Friedman and his colleagues are collaborating with some of the neurosurgeons there on research projects.

There are many joint research projects underway in which our faculty members collaborate with investigators in other departments. One large and important example is the program project being put together by Dr. Capizzi of the Department of Medicine on clinical and translational research in anti-angiogenesis. Both our ultrasound and MRI divisions are participating in this. Our neuroradiologists are working with Dr. Tracy from the Department of Neurology on development of a functional MRI research program. Faculty in our Breast Imaging Center are working with Dr. Sauter of the Department of Surgery on correlation of nipple aspirates with clinical findings. Dr. Goldberg and his colleagues in ultrasound are continuing their collaboration with the biomedical engineering group at Drexel and they are currently in the process in trying to develop a similar relationship with the department of engineering at the University of Delaware. There are many other similar examples of our interdepartmental relationships in research.

In the area of clinical collaboration, we are continuing to discuss with the Division of Vascular Surgery the formation of a Jefferson Vascular Center. Although these discussions have been quite prolonged and
complex, we are hopeful that this will come to pass in the relatively near future. Drs. Goldberg, Kurtz and I have had similar discussions with Drs. Bolognase and Weiner from the Department of Obstetrics and Gynecology on a joint relationship with them in obstetrical and gynecologic ultrasound. The Rothman Institute has just opened its own MRI unit and we will be doing all the interpretations of studies performed in that unit. This provides us a badly needed additional MRI unit on the campus. Another example of collaboration with the Department of Orthopedic Surgery is the work that Dr. Nazarian and his colleagues have been doing in diagnosing tendon and other soft tissue injuries, and then treating them with ultrasound-guided interventions.

We continue to consider the Methodist Hospital radiology group as a division of our department. I periodically discuss issues with Dr. Larry Caputo and Mr. Jim Robinson (who recently became the administrator for Methodist Hospital). I'm pleased to report that the Methodist radiology group is making a significant financial contribution to support research and educational activities at Jefferson.

DEPARTMENT ADMINISTRATION

All of us were greatly saddened by the untimely death of Judy Dubbs, our grants administrator. Fortunately, Andrea Maitino was able to assume the workload during Judy's illness, and she did so well that she has now been appointed as Judy's successor on a permanent basis. She has continued to do a fine job in this important role.

Some major changes were made in department leadership. Three new vice-chairs were appointed. Dr. Mark Schweitzer has become vice-chair for clinical practice and director of the general diagnostic division; Dr. Vijay Rao has become vice-chair for education; and Dr. Barry Goldberg has been become vice-chair for research. I chose to elevate the three of them to vice-chairmanships because of the fine work all three have done during recent years in fulfilling these roles. Dr. Alfred Kurtz remains as vice-chair for administration. Dr. Catherine Piccoli was appointed the new division director of our Breast Imaging Center. She has done an outstanding job this year in stabilizing what had become a chaotic situation there, and with her help, we have been able to recruit an excellent group of new breast imaging faculty members – Drs. Susan Trevisan, Susan DeWyngaert, Barbara Cavanaugh, and Steven Lee. During the year, Dr. Rob Morales joined our neuroradiology division, and Dr. Patrick O'Kane joined us in ultrasound/CT. Other new faculty members who will be joining us during the 2000-01 year are Drs. Bidyut Pramanik and Pamela VanTassel in neuroradiology, John Carrino and J. A. Parellada in musculoskeletal radiology, Carin Gonsalves in CVIR, and Wallace T. Miller, Jr. as head of our chest section. Obviously all this recruitment consumed a tremendous amount of time and effort this past year.

Victor Sarro and his administrative team once again did an excellent job managing all the complex operations of our department. Some of their major accomplishments this past year include the following: (1) Planned for major renovations of the Breast Imaging Center in the MOB basement and a brand new Breast Screening Center on the 3rd floor of the MOB, (2) Continued upgrading of our PACS and secured approval for the imminent extension of PACS to the ultrasound division, (3) Began planning for the installation of a new commercial radiology information system, (4) Designed and implemented a new scheduling system for ultrasound to use as part of our current radiology information system, (5) Secured approval and planned for the installation of our new molecular coincidence detection camera in nuclear medicine, (6) Planned and completed the installation of our two new angio rooms in CVIR, (7) Planned for the commencement of our coverage of three major new outside contracts – Marlton MRI, Doylestown MRI, and the MRI now being installed at the Rothman Institute, (8) Expanded CT hours on 10 Main in an effort to reduce CT backlogs, (9) Planned and installed the new DEXA scanner in nuclear medicine, (10) Oversaw the replacement of laser cameras in the COB and 10 Main, while at the same time achieving approximately a $65,000 saving through reduction in laser camera film use, (11) Made revisions in our
billing procedures to allow for the use of additional ICD-9 codes, (12) Further expanded independent contracting for transcription of radiology reports, (13) Last but by no means least – oversaw a very successful financial year for our practice. All of us on the faculty greatly appreciate the work of Mr. Sarro and his many colleagues in our department administration.

DEPARTMENT GOALS

Improve Clinical Efficiency in Order to Increase Our Caseload While Still Preserving Academic Time – This has been a top priority for us each of the last several years, and it continues to be.

Improve Academic Productivity – This goal is of course closely related to the above. An interesting article published this past year by Dr. Eschelman showed that academic productivity diminishes as clinical workload increases. This is not a surprising finding but his study was the first to clearly document it. Our three busiest groups, in terms of clinical caseload as measured by faculty RVUs, are CVIR, neuroradiology, and musculoskeletal radiology. It is to the great credit of Dr. Mark Schweitzer and his colleagues that our musculoskeletal section has been able to maintain its tremendous research productivity in the face of a heavy clinical caseload. Academic productivity has unfortunately dropped off to some extent in CVIR and neuroradiology (with the exception of Dr. Rao). We have created a new faculty slot in each of these three groups, and my hope is that with the additional manpower we will see more and better research. A very important part of research productivity is grant funding. With a total of 67 separately funded grants and 232 publications this past year, we have a record of which the department can be proud. However, we want to keep improving on that record. Of course, in order to conduct high quality, fundable research, we need to have the appropriate infrastructure. As discussed previously and below, the lack of access to our overage fund reserves is a serious impediment to this goal.

Improve Report Turnaround Time – We need to redouble our efforts to shorten our turnaround time as much as possible. This is a multi-faceted problem, not the least of which are the difficulties we have had in dealing with outside transcription services and finding qualified transcriptionists in a full employment economy. The ultimate solution to this problem is through implementation of a voice recognition system.

Expand Our Outpatient Services – On the one hand, it may be nice to have the problem of so much demand for our services that we can’t keep up with it. On the other hand, it is frustrating because we want to provide the best possible service to our patients and referring physicians. Long backlogs are particularly prevalent for MRI, CT, and mammography. We hope the opening of the new MRI in the Rothman Institute will reduce the MRI backlogs. We also hope the opening of a new and expanded screening mammography facility on the 3rd floor of the MOB will help alleviate mammography backlogs. We are still having difficulties meeting the demand for CT. We could accommodate more volume in plain film radiography, ultrasound, and nuclear medicine.

Improve Recruitment of Fellows – There has been an explosion in demand for radiology residency slots among American medical students. We are almost overwhelmed with applications from top-notch candidates for our six positions each year. However, recruitment for our fellowship positions has become much more difficult. This is because there are many more fellowship slots available around the country than residency slots, so there is much greater competition for graduating residents. Also, because of the nationwide shortage of radiologists, increasing numbers of graduating residents are going directly into practice instead of taking fellowships. The problem is especially pressing in neuroradiology and to some extent women’s imaging, but it affects all of our fellowship programs. We need to redouble our efforts to make our fellowship programs as attractive as possible.

Move Toward the Era of All-Electronic Radiology – This will be a tremendous undertaking, but it clearly represents the long-term future of radiology. Before too many more years have gone by, the
practice of radiology will be filmless and paperless. We have taken the first steps toward this goal with the implementation of our PACS for MRI and CT. However, all-electronic radiology will entail much more. We will have to move toward electronic order entry, totally computerized scheduling, digital imaging in all modalities, full implementation of PACS, acquisition of a new and modernized radiology information system, interfacing of that system with the hospital information system, voice recognition, image distribution from our imaging devices and reading workstations to PCs of referring physicians and other user areas around the hospital, and an interface to our billing system. All of this will be a huge undertaking that will require years of planning, hard work, and the expenditure of sufficient funds. We also have to take great care to implement these changes slowly and only when the technology has really become “ready for prime time”.

**ISSUES FOR THE COLLEGE, UNIVERSITY AND HOSPITAL**

**Dealings between the Jefferson Health System and the major healthcare insurance carriers** – Before going into some of the serious issues confronting us (see below), I want to give credit to the leadership of the university and the Jefferson Health System. During the past year, we have gone through difficult negotiations with Independence Blue Cross, and it appears that a reasonably favorable settlement has been obtained by the JHS. Some years ago when the JHS was first being formed, there were a number of skeptics around the campus (I was one of them). However, developments in recent years have shown that the only way to successfully deal with the two giant payors in this area (who have been allowed by our strange legal system to amass virtual monopoly powers) is to deal from a position of strength through the formation of large hospital groups like the JHS. We are now the biggest provider system in the Philadelphia area and I think it was very prescient for the leadership to realize years ago that this type of integrated system of hospitals and physician practices was the key to survival.

**Development of a Jefferson Biomedical Imaging Research Support Center** – I alluded to this earlier and described in more detail the proposal I had made to the task force on strategic planning for research. A number of other clinical departments also supported the need for an imaging research facility, which would service other Jefferson groups that need to use imaging as part of their funded research. This would truly be a multidisciplinary facility, not just one belonging to the department of radiology. If we had such a facility on campus, it would help in three ways. First, Jefferson investigators who now have to go to Penn or other universities to have their research imaging done could keep those dollars here at TJU. Second, it would strengthen proposals made by Jefferson investigators if they could show the NIH that their need to perform imaging as part of their research could be satisfied right here. Third, the ability of the department of radiology to obtain grant funding would be immeasurably strengthened by having sophisticated research equipment, like that possessed by virtually all other leading academic radiology departments.

**Access to departmental research (overage) funds** – I alluded to this earlier as well. The current University policy of denying clinical departments access to the reserves in their overage funds has seriously impaired research and teaching programs around the campus. If we are to do high quality research, provide good teaching for our students and trainees, and retain faculty members who want to pursue academic careers, we simply must be able to build the necessary infrastructure within our own departments. If we are denied access to our overage funds, there’s no way this kind of infrastructure can be developed. This situation could lead to disastrous results for Jefferson’s academic programs and stature if the problem isn’t rectified quickly.

**Modernization of our equipment and physical plant** – As noted earlier, some of our imaging devices have become obsolete and others are outdated and in need of upgrading. I and Victor Sarro (and George McArdle before him) have for years tried to convince the hospital administration of the need for a replacement budget to keep our equipment at state-of-the-art levels. Because of severe budgetary
restrictions, it hasn’t been possible to do this in the past. I understand the nature of this problem quite clearly, but we’ve arrived at the point where something has to be done quickly. There are many other academic medical centers facing fiscal problems similar to those at Jefferson, yet they have somehow found the wherewithal to keep their radiology departments up to date. The recent ECRI report has clearly supported our recommendations for updating the department’s equipment, and I sincerely hope the hospital administration will take some firm action. If there are still serious limitations of funding, we should look at alternative financial sources to purchase and operate new equipment. The Rothman Institute was allowed to purchase its own MRI unit, and perhaps the radiology department needs to do the same thing. Funding through JUP or even private companies are other possibilities that should be explored.

Dean’s Tax – To the best of my knowledge, Jefferson is 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. Virtually everywhere else the Dean’s tax is taken as a flat percentage “off the top” (i.e. as a percentage of total collected revenues before expenses). This is a much more equitable and simple way of doing business. The Medical College would be assured of the revenue stream it needs. The clinical departments would be left to run their own affairs after the Dean’s tax had been paid, without the micromanagement by the medical school administration that has characterized our operations in recent years. Taking the Dean’s tax off the bottom is a disincentive to good management – the more money a practice spends up front, the less it will have to pay as a Dean’s tax at the end of the year. This simply doesn’t make sense.

Salaries for technologists – An acute shortage of qualified radiologic technologists has developed. This is particularly true in some of the more specialized areas, such as MRI, mammography, and vascular ultrasound. It has become difficult for us to recruit and retain good technologists, because in some instances the salary scales offered by TJUH are not competitive with other institutions. Although I don’t claim to be an expert in compensation or other personnel matters, I’d like to see TJUH be at the leading edge of compensation of key employees like technologists, rather than on the trailing edge.

New residency slot – There is an even more acute shortage of radiologists in this country and I foresee the situation continuing for many years. We and other good radiology residency programs need to increase our output of young radiologists. I have requested the addition of one more residency slot per year from the hospital administration and I hope they will approve it.
TEACHING PROGRAMS
Vijay M. Rao, M.D.
Vice-Chair for Education

INTRODUCTION

Three years ago I reported that radiology as a career was falling out of favor compared with the primary care fields. At the present time, there is a severe shortage of radiologists. The job market is booming, and radiology is again at the forefront among career choices for medical students. All of our fellow graduates found themselves highly competitive in the marketplace and were able to choose from several job offers. All of our resident graduates have been accepted into top notch fellowship programs. Four out of the six residents chose to stay with us for fellowship training. This is a testimony to the excellence of our training programs.

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. Four of the six graduating residents chose to stay with us for fellowships; one in vascular and interventional radiology, one in musculoskeletal radiology, and two in cross-sectional imaging. One resident accepted a fellowship in body imaging at Johns Hopkins Hospital. The sixth resident will pursue a fellowship in imaging at the Medical University of South Carolina.

Resident Selection: This year we received 435 applications for six positions and interviewed 55 applicants. The results of the residency match program (NIRMP) 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. Much credit goes to Levon Nazarian, M.D., Chairman of the Residency Selection Committee, for this laudable performance.

Resident Research: It is gratifying to note that our residents are active in research and have presented several scientific papers at national radiology meetings. 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. Jennifer Park, M.D. was the recipient of the 2000 Roentgen Research Award for our department.

Clinical Training: Our clinical practice continues to grow, and this provides a wealth of interesting case material for our resident/fellow education. Over the past few years, teleradiology/PACS has been phased in to our clinical practice for MRI and CT image 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. We need to upgrade audiovisual equipment in the main classroom and acquire digital projectors, which would allow Powerpoint presentations and also provide for direct interfacing with the PACS. Our overhead projector in the classroom is antiquated. We need access to resources to purchase or update equipment and other teaching materials in order to adequately educate our trainees.
The staff coverage for pediatric radiology at Jefferson, provided by A.I. DuPont, was further curtailed which adversely affected the residents' education. In order to correct for this deficiency, the departmental education committee voted to send our residents to A.I. DuPont Institute for an additional month of pediatric radiology rotation.

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.

**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 William Morrison, M.D. was the recipient.

**TRAINING PROGRAM FOR FELLOWS**

Our fellowship programs continue to thrive in all areas, although demand is often driven by market forces. We saw a slump in the number of applicants for neuroradiology fellowships again this year. On the other hand, there was an increased demand for fellowships in the combined body MRI and neuro MRI program. To accommodate this, we used some of the unfilled traditional neuroradiology fellowship slots to recruit the better fellowship applicants into our combined program. We are also looking to redesign the breast imaging fellowship 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 continues to be in great demand. Our neuroradiology/ENT radiology and CVIR fellowship programs are accredited by the ACGME.

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., Paul Spire, M.D., Lisa Tartaglino, M.D., and Terri Tuckman, M.D. Dr. Spire served as the coordinator of this course for this year and has done a fine job. Dr. Tuckman will assume this responsibility for the next academic year.

The junior and senior students can choose to attend one or more of the five separate electives offered by our department which include general radiology, pediatric radiology, neuroradiology/ENT radiology, CVIR, and Ultrasound/CT/MRI. The radiology electives remain quite popular and were completed by 134 members (64%) 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 19 students in attendance this year.

I wish to thank Paul Spire, M.D. for his contributions to the medical student education program. Paul served as the director of the general radiology elective course for a number of years and did a great job. Paul will be joining the faculty at the Brigham and Women’s Hospital in September 2000.
Miller, Jr., M.D. joins us from the Hospital of the University of Pennsylvania and will serve as the director of the general radiology core elective course next year. Dr. Miller is a well-reputed educator and has been the recipient of the teaching award given by medical students at the University of Pennsylvania. I look forward to a very strong educational program for medical students under his leadership.

The neuroradiology elective was completed by 5 senior medical students. The pediatric radiology elective was completed by 2 senior students. Electives in Cross-Sectional Imaging and CVIR were completed by 3 and 5 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, George Gross, M.D. for pediatric radiology, 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. The Shoulder, Elbow and Wrist Imaging Symposium was directed by Mark Schweitzer, M.D. and David Karasick, M.D. in October, 1999 with 147 attendees and the 5th Annual Jefferson Foot, Knee and Ankle Advanced Imaging Symposium was also directed by Drs. Schweitzer and Dr. Karasick in April, 2000 with 131 attendees.

13th Annual Philip J. Hodes Lecture. In honor of Philip J. Hodes, M.D., the Thirteenth Annual Philip J. Hodes lecture was very successful. The guest speaker was Hedvig Hricak, M.D, Professor and Chairman of the Department of Radiology at the Memorial Sloan Kettering Cancer Center in New York, New York. She gave an outstanding presentation entitled "Modern Cancer Imaging: Can We Afford It?"

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 under the leadership of Barry B. Goldberg, M.D. continues to expand its educational efforts here at Jefferson by offering a wide range of courses covering all aspects of ultrasound. The newest courses offered include 3-D Ultrasound imaging, Musculoskeletal Ultrasound, Sonomammography, Interventional Ultrasound and Ultrasound Contrast Imaging. We continue to offer basic ultrasound programs in abdomen, obstetrics and gynecology, echocardiography and Doppler ultrasound. More than 45 courses were offered in the Division of Ultrasound this past year.

In addition, the 20th Annual Leading Edge in Diagnostic Ultrasound Conference was held in Atlantic City and was a major success with over 1300 attendees. A wide variety of ultrasound equipment was on display and the booth space was completely sold out. Plans are in progress to increase the attendance by offering multiple simultaneous courses for next year's Leading Edge Meeting by including programs on Doppler Ultrasound, Obstetrics and Gynecology including 3D Imaging, Musculoskeletal Imaging, Sonomammography, and a Symposium on Ultrasound Contrast Agents as well as an Introductory Course on Ultrasound Physics.

There has been further expansion of our affiliate ultrasound education programs in many countries around the world. There are now some 41 affiliated programs throughout Europe, South America, Asia and Africa. Programs continue to grow with ongoing support from ultrasound manufacturers and
pharmaceutical companies. We also continue to receive support from foundations. The Soros Foundation (Open Society Institute) has continued to support our program for international training and the production of educational materials for our affiliate sites. JUREI provides training not only to individuals who purchase equipment, but also sales, marketing and engineering personnel. We also produce videotapes for educational purposes for the training of physicians and support personnel.

A grant was submitted to the Research and Education Fund of the Radiological Society of North America to develop six affiliated education centers in Subsaharan Africa. This is an underserved region in terms of imaging. Ultrasound is an ideal imaging approach that is being emphasized by the World Health Organization of which JUREI is an affiliate. The program will result in the training of 24 physicians from countries in Africa who will return to their countries to develop ultrasound training centers which will be supported by JUREI supplied educational materials, teaching manuals and specially developed examinations. These centers will be linked with our Internet connections for continually updating our materials. They will also be connected with our other centers around the world. Thus, JUREI continues its efforts in education providing a wide variety of educational programs that cover all aspects of ultrasound in order to increase the level of knowledge and raise 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 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 will allow us to continue to attract the best candidates for residency and fellowship programs in the future.
PUBLICATIONS

Journal Articles:


33. Ito K, Blasbalg R, Hussain SM, Mitchell DG: Portal vein and its tributaries: Evaluation with thin-


44. Kipper SL, Rypins EB, Evans DG, Thakur ML, Smith TD, Rhodes B: Neutrophil-specific 99mTc-


53. Maidment AD. Lossy compression should not be used in certain imaging applications such as chest radiography. Against the proposition. *Med Physics* 1999; 26:1774-1775.


Books and Book Chapters:


Abstracts:


FORMAL SCIENTIFIC PRESENTATIONS

DAVID J. ESCHELMAN, M.D.

March 25-30, 2000
25th Annual Scientific Meeting of the Society of Cardiovascular and Interventional Radiology, San Diego, CA
• “Introduction to venous access” (workshop)

April 26-29, 2000
42nd Annual Meeting of the Eastern Radiological Society, La Quinta, CA
• “The relationship of clinical and academic productivity in a university hospital radiology department”

RICK I. FELD, M.D.

October 10, 1999
Annual Meeting and Postgraduate Educational Course of the Society of Radiologists in Ultrasound, Chicago, IL
• "Ultrasound guided biopsy: Tissue is the Issue"

November 28- December 3, 1999
85th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
• "Intraoperative ultrasound localization of breast masses for surgical excisional biopsy"

April 2-5, 2000
44th Annual Convention of the American Institute of Ultrasound in Medicine, San Francisco, CA
• "Imaging guidance for abdominal biopsies: Ultrasound"

April 12, 2000
Mercy Fitzgerald Hospital, Darby, PA
• "Sonographically-guided abscess drainage and case presentations"

April 24, 2000
Overlook Hospital, Summit, NJ
• “Cholecystitis, appendicitis and ectopic pregnancy”
• Case presentations

May 8-11, 2000
100th Annual Scientific Meeting of the American Roentgen Ray Society Washington, DC
• "Prognostic implications of negative intraoperative liver sonography in colorectal cancer: Work in Progress"
• "Detection of malignancy in thyroid nodule "incidentaloma" by sonographically-guided biopsy"

May 22-26, 2000
The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
• "Vascular injury: Diagnosis and nonsurgical repair"
• "Cryoablation of focal neoplasms"

June 15, 2000
Monmouth Medical Center, Monmouth, NJ
• "Scrotal ultrasound"
• "Vascular injury: Diagnosis and nonsurgical repair"
• "Cryoablation of focal neoplasms"
ADAM E. FLANDERS, M.D

March 8, 2000
Philadelphia Epilepsy Symposium, Philadelphia, PA
- "Proton MR spectroscopy in the evaluation of temporal lobe epilepsy"

March 15-19, 2000
67th Annual Meeting of the American Academy of Orthopedic Surgery, Orlando, FL
- "Imaging strategies in thoracolumbar trauma"

FLEMMING FORSBERG, PH.D.

July 30, 1999
Advanced Logiq 700 Technology, GE Medical Systems, Milwaukee, WI
- "Current concepts in ultrasound contrast agents and harmonic imaging"

September 17-19, 1999
20th Annual Meeting of the Australasian Society for Ultrasound in Medicine, Adelaide, Australia
- "Basic principles of ultrasound contrast agents"
- "Measuring blood flow and perfusion - Is contrast the answer?"
- "On the future of instrumentation"
- "Flash echo imaging and other new developments"

September 20, 1999
Meeting of the Western Australia Branch of the College of Radiologists, Perth, Australia
- "Ultrasound contrast agents and flash echo imaging"

September 23, 1999
Meeting of the Victoria Branch of the College of Radiologists, Melbourne, Australia
- "Ultrasound contrast agents and flash echo imaging"

September 27, 1999
Toshiba Australia Pty Meeting, Sydney, Australia
- "Ultrasound contrast agents and flash echo imaging"

October 23-24, 1999
1st International Kyoto Symposium on Ultrasound Contrast Imaging, Kyoto, Japan
- "Influence of filling gas on the persistence and backscatter of contrast microbubbles"

October 28-31, 1999
19th Annual Pittsburgh Breast Imaging Seminar, Pittsburgh, PA
- "Ultrasound physics and quality control"

November 5, 1999
Advanced Logiq 700 Technology, GE Medical Systems, Milwaukee, WI
- "Current concepts in ultrasound contrast agents and harmonic imaging"

November 28-
December 3, 1999
85th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- "In vitro and in vivo flow estimation using harmonic flash echo imaging"
<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Presentations</th>
</tr>
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<tbody>
<tr>
<td>December 15, 1999</td>
<td>Advanced Logiq 700 Technology, GE Medical Systems, Milwaukee, WI</td>
<td>• &quot;Current concepts in ultrasound contrast agents and harmonic imaging&quot;</td>
</tr>
<tr>
<td>March 16, 2000</td>
<td>Advanced Logiq 700 Technology, GE Medical Systems, Milwaukee, WI</td>
<td>• &quot;Current concepts in ultrasound contrast agents and harmonic imaging&quot;</td>
</tr>
<tr>
<td>April 2-5, 2000</td>
<td>44th Annual Convention of the American Institute of Ultrasound in Medicine, San Francisco, CA</td>
<td>• &quot;Real-time compound imaging of hepatic VX-2 tumors in rabbits&quot;</td>
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<td>• &quot;Conventional ultrasound and MRI versus contrast enhanced ultrasound for hepatic tumor detection&quot;</td>
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<td>• &quot;Quantifying breast tumor neovascularity by contrast enhanced ultrasound and pathology: A comparative study&quot;</td>
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<td>• &quot;Comparison of flash echo imaging and time domain correlation for in vivo flow estimation&quot;</td>
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<td>• &quot;Prostate tumor detection with phase inversion ultrasound contrast imaging&quot;</td>
</tr>
<tr>
<td>April 13, 2000</td>
<td>Advanced Logiq 700 Technology, GE Medical Systems, Milwaukee, WI</td>
<td>• &quot;Detection directions - A historic look at the future&quot;</td>
</tr>
<tr>
<td>May 22-26, 2000</td>
<td>The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ</td>
<td>• &quot;Breast tumor neovascularity detected with contrast and pathology&quot;</td>
</tr>
<tr>
<td>June 8-11, 2000</td>
<td>Era of Hope, Department of Defense Breast Cancer Research Meeting, Atlanta, GA</td>
<td>• &quot;Contrast enhanced ultrasound imaging of breast tumors&quot;</td>
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<td></td>
<td>• &quot;Contrast enhanced ultrasound imaging of breast tumors&quot; (poster)</td>
</tr>
<tr>
<td>June 15, 2000</td>
<td>Advanced Logiq 700 Technology, GE Medical Systems, Milwaukee, WI</td>
<td>• &quot;Detection directions - A historic look at the future&quot;</td>
</tr>
</tbody>
</table>

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

November 28-December 3, 1999: 85th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
• “Spectrum of MR imaging findings in patients undergoing stereotactic radiosurgery for tumors, vascular malformations, movement disorders, and trigeminal neuralgia” (exhibit)

**BARRY B. GOLDBERG, MD**

October 7, 1999: Society of Radiologists in Ultrasound, Fellows Meeting, Chicago, IL
• “Detection of hemorrhage using contrast-enhanced three-dimensional ultrasound imaging”
October 11, 1999  
IX Latin-American Ultrasound Congress, 28th Brazilian Congress of Radiology, São Paulo, Brazil  
- “Non-obstetrical uses of three-dimensional ultrasound”  
- “Advances in ultrasound contrast agents”

October 14, 1999  
Second International Congress on 3D Ultrasound in Obstetrics and Gynecology, Las Vegas, NV  
- “Three-dimensional power/color Doppler and contrast”  
- “Payment for studies”

November 28-December 3, 1999  
85th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL  
- “Ultrasound: Advances in contrast agents and three-dimensional imaging”  
- “Use of power Doppler in assessing vascular changes during fracture treatment with low intensity ultrasound” (exhibit)

January 15, 2000  
United States of America - International Health Program Conference, Philadelphia, PA  
- “The development of ultrasound training centers in developing countries around the world”

April 2-5, 2000  
44th Annual Convention of the American Institute of Ultrasound in Medicine San Francisco, CA  
- “Ultrasound: Past, present, and future”  
- “Three-dimensional ultrasound imaging”  
- “Future clinical challenges and development”  
- “Contrast-enhanced sonography for guidance and evaluation of liver tumor ablation”  
- “Contrast-enhanced two-dimensional and three-dimensional sonography for detection of intra-abdominal organ bleeding”  
- “Governmental influences on ultrasound”

April 14, 2000  
Departments of Radiology and Biochemistry/Biophysics, Johnson Research Foundation, University of Pennsylvania, Philadelphia, PA  
- “Co-registration with ultrasound”

May 6-10, 2000  
9th Congress of the World Federation of Ultrasound in Medicine and Biology, Florence, Italy  
- “Overview of clinical applications of contrast media in internal medicine”  
- “Contrast-enhanced two-dimensional and three-dimensional ultrasound for detection of intra-abdominal organ bleeding”  
- “Three-dimensional angio ultrasound”  
- “Teaching the teachers: The Philadelphia experience”

June 5, 2000  
SonoNet 2000: 2nd International Seminar in Diagnostic and Interventional Ultrasonography, Dubrovnik, Croatia  
- “New advances in ultrasonography”
ETHAN J. HALPERN, M.D.

October 6, 1999
57th Annual Meeting of the Mid-Atlantic Section, American Urological Association, Hilton Head, SC
- "Initial experience with contrast-enhanced (Imagent®) intermittent imaging and wideband harmonic imaging of the prostate"
- "Gray scale, color and power Doppler sonography in the detection of prostate cancer"
- "Visualization of bleeding during prostate biopsy with contrast-enhanced imaging using Imagent®"

October 25, 1999
Mount Sinai Medical Center Grand Rounds, New York, NY
- "CT angiography of the visceral vessels"

November 28-December 3, 1999
85th Scientific Assembly and Annual Meeting of the Radiologic Society of North America, Chicago, IL
- "Initial clinical experience with contrast-enhanced sonography of the prostate using Imagent®.
- "Comparison of CT angiography and MR angiography for pre-operative evaluation of renal donors"

April 2-5, 2000
44th Annual Convention of the American Institute of Ultrasound in Medicine, San Francisco, CA
- "Contrast-enhanced imaging, intermittent imaging, and harmonic imaging of the prostate using Imagent®"
- "Ultrasound and Doppler and organ transplants: Liver transplants"

April 6, 2000
Philadelphia Roentgen Ray Society, Blue Ribbon Lecture, Joint Conference with the Delaware Valley Ultrasound Society, Philadelphia, PA
- "Ultrasound evaluation of liver transplants"

April 13, 2000
Beth Israel Medical Center Grand Rounds, New York, NY
- "CT angiography of the aorta and visceral arteries"

May 23-26, 2000
The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
- "Doppler of liver transplants"
- "Intermittent imaging of the prostate"

May 30, 2000
2nd Annual Consensus Conference on Contrast Enhanced Ultrasound, Lugano, Switzerland
- "Medical need and potential role of contrast US in prostate imaging"

GEORGE A. HOLLAND, M.D.

April 1-7, 2000
8th Scientific Meeting and Exhibition of the International Society of Magnetic Resonance in Medicine, Denver, CO
- "Categorical course: Body MRA"
CHARLES M. INTENZO, M.D.

November 28-December 3, 1999  85th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- "The spectrum of scintigraphic findings in autoimmune thyroiditis: Laboratory and pathologic correlation"
- "The evolving nuclear imaging of simultaneous kidney-pancreas transplantation: A pictorial essay"

June 3-6, 2000  47th Scientific Assembly and Annual Meeting of the Society of Nuclear Medicine, St. Louis, MO
- "Do emergency room physicians over-utilize lung scintigraphy? Results of a six-year analysis"

DAVID KARASICK, M.D.

August 19, 1999  International Skeletal Society, Seattle, WA
- "MRI of ankle tendons" (refresher course)

October 9-10, 1999  5th Annual Jefferson Foot, Ankle and Knee Imaging Symposium, Jefferson Medical College, Philadelphia, PA (Course Co-Director)
- "MR of ankle tendons"
- "Soft tissue and bone tumors of the foot/ankle"
- "CT of the knee"

March 30, 2000  Bryn Mawr Hospital, Bryn Mawr, PA
- "Bone tumors"

April 29, 2000  Fourth Annual Jefferson Shoulder, Elbow and Wrist Advanced Imaging Symposium, Jefferson Medical College, Philadelphia, PA (Course Co-Director)
- "Fracture-dislocations of the shoulder"
- "Radiographic evaluation of shoulder arthritis, calcific tendinitis and impingement"
- "CT of wrist trauma"

STEPHEN KARASICK, M.D.

November 28-December 3, 1999  85th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- "Defecography: Not for women only"

December 10, 1999  1999 – 2000 Diagnostic Dilemmas: Choosing the Best Test, Jefferson Healthcare College, sponsored by Thomas Jefferson University Hospital, Philadelphia, PA
- "Barium enema (ACBE)"

March 15, 2000  Abdominal Radiology Postgraduate Course 2000, Kauai, Hawaii
- "Hysterosalpingography - Basic to the bizarre"
SUNG M. KIM, M.D.

November 28-December 3, 1999

85th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- “Crossed cerebella diaschisis in patients with head injury”
- “Predictor of tumor response to stereotactic radiosurgery in skull base meningioma using Octreotide brain SPECT”

March 8-11, 2000

27th Annual Course in Electrodiagnosis and Clinical Neurophysiology, Epilepsia Symposium 2000, Jefferson Medical College, Philadelphia, PA
- “Brain perfusion SPECT in epilepsy”

March 18, 2000

CME Course for Radiology Technologist, Langhorn, PA
- “Oncologic imaging in nuclear medicine”

ALFRED B. KURTZ, M.D.

September 24, 1999

Advanced Seminars in Ultrasound Diagnosis, New York, NY
- “Diagnosis of ovarian cancer with CT and MRI correlation”
- “Sonohysterography”

October 8, 1999

9th Annual Meeting and Postgraduate Educational Course of the Society of Radiologists in Ultrasound, Chicago, IL
- “Problems in diagnosis of the fetal GI tract”

January 15, 2000

8th Annual Perinatal Ultrasound Symposium, New Brunswick, NJ
- “Do we need Doppler in the evaluation of ectopic pregnancies”
- “Do the ultrasound standards as proposed by AIUM/ACR make sense”

February 8, 2000

Brigham and Women’s Hospital Grand Rounds, Boston, MA
- “Ovarian cancer: A multimodality approach”

February 8, 2000

New England Society of Ultrasound in Medicine, Boston, MA
- “Echogenicity: Analysis and significance”

March 9, 2000

Department of Radiology, Brooke Army Medical Center, Department of Army, San Antonio, TX
- “First trimester ultrasound evaluation”
- “Twin pregnancy analysis”
- Case presentation

March 9, 2000

Department of Radiology, Wilford Hall Medical Center, Department of Air Force, San Antonio, TX
- “First trimester ultrasound evaluation”

March 23, 2000

Bryn Mawr Hospital Ultrasound Radiology Conference, Bryn Mawr, PA
- Ultrasound case presentation

April 2-5, 2000

44th Annual Convention of the American Institute of Ultrasound in Medicine, San Francisco, CA
• "Obstetrical emergencies in the second and third trimesters: Sonographic detection"
• "Three-dimensional multiplanar sonohysterography: Comparison with two-dimensional sonohysterography and x-ray hysterosalpingography" (scientific exhibit)

May 6-10, 2000
9th Congress of the World Federation for Ultrasound in Medicine and Biology, Florence, Italy
• "Echogenicity; analysis and significance"

May 19-21, 2000
85th Annual Meeting of the Pennsylvania Radiological Society; Annual Oration in Honor of Barry B. Goldberg, M.D., FACR, Hershey, PA
• "The wonderful world of ultrasound"

May 22-26, 2000
The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ (Course Co-Director)
• "The post partum uterus"

DAVID C. LEVIN M.D.

September 15, 1999
Cardiovascular Board Review Course of the American College of Cardiology, Rosemont, IL
• "Angiography: Coronary, ventricular and aorta"
• "Chest x-ray, CT and MRI"

October 11, 1999
Philadelphia Board Review Course in Cardiovascular Diseases, Jefferson Medical College and the American Heart Association, Philadelphia, PA
• "Radiology: X-ray and CT"

October 23-24, 1999
Economics of Diagnostic Imaging 1999: National Symposium, Washington, DC
• "A Medicare compliance program for a typical academic radiology department"
• "How much ultrasound is actually performed by emergency medicine physicians? The hype versus the reality"

November 28-December 3, 1999
85th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
• "Turf battles in radiology: How to fight them and win!"
• "The role of emergency medicine physicians in ultrasound performed in emergency department patients: How substantial is their participation?"
• "Comparison of the roles of radiologists and nonradiologists in performance of abdominal, retroperitoneal, and pelvic ultrasound in 1993 and 1997"
• "Relative roles of radiologists and nonradiologists in vascular ultrasound in hospitals and private offices: Comparison between 1993 and 1997 using a nationwide database"
• "Negotiating a managed care contract"
• "Who performs noncardiac percutaneous transluminal angioplasty and other percutaneous interventions used to treat vascular disease: Relative roles of radiologists, cardiologists and surgeons, based upon nationwide 1997 Medicare"
February 17, 2000  University of Chicago Hospital, Chicago, IL
- “Recent nationwide data on duplication of services by nonradiologists in emergency department ultrasound and peripheral vascular interventions”

February 17, 2000  Memorial Lecture Award of the Chicago Radiological Society, Chicago, IL
- “Turf encroachment and quality issues in diagnostic radiology”

April 7, 2000  Association of University Radiologists, Orlando, FL
- “Revitalizing clinical practice, research and education in cardiovascular imaging for radiologists/trainees”

April 17, 2000  Fourteenth Annual Castele Lecture of the Cleveland Radiological Society and University Hospitals of Cleveland, Cleveland, OH
- “Attempts at encroachment by other medical specialties upon the practice of radiology – how should radiologists respond?”

April 18, 2000  University Hospitals of Cleveland, Cleveland, OH
- “How to interpret coronary arteriograms – prepare yourself for the upcoming era of coronary MRA!”

May 5, 2000  State University of New York/Downstate Medical Center, Brooklyn, NY
- “Encroachment by other medical specialties on radiology – what can radiologists do about it?”

ANNA S. LEV-TOAFF, M.D.

August 18, 1999  Bracco Diagnostic Visiting Faculty Program, Las Vegas, NV
- “Use of oral contrast in abdominal sonography”

September 15, 1999  Delaware Valley Perinatal Society, Philadelphia, PA
- “Three-dimensional ultrasound: Gynecologic applications”

September 23, 1999  Bracco Diagnostics Visiting Faculty Program, Philadelphia, PA
- “Oral contrast agents: Applications for abdominal ultrasound”

October 14-15, 1999  Second International Congress on 3D Ultrasound in Obstetrics and Gynecology, Las Vegas, NV
- “Three-dimensional sonohysterography”

November 17, 1999  Bracco Diagnostics Visiting Faculty Program, Baltimore, MD
- “Oral contrast agents in ultrasound”

November 28-December 3, 1999  85th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- “Transvaginal sonography and sonohysterography: Their effective use in triaging women before endometrial ablation”
- “Detection and characterization of gastrointestinal pathology with transabdominal ultrasound using an oral contrast agent: Comparison with endoscopic findings. (exhibit)”
<table>
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<tr>
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<tbody>
<tr>
<td>December 14, 1999</td>
<td>Bracco Diagnostics Regional Meeting, Dallas, TX</td>
<td>- &quot;Oral contrast agents in ultrasound&quot;</td>
</tr>
<tr>
<td>March 17-19, 2000</td>
<td>Women's Imaging, Porto Allegre, Brazil</td>
<td>- &quot;Hysterosalpingography: Pre- and post-operative assessment&quot;</td>
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<td>- &quot;Three-dimensional ultrasound in obstetrics and gynecology&quot;</td>
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<td>- &quot;Interesting cases: Multi-modality evaluation&quot;</td>
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<td>- &quot;Sonohysterography: Current role in clinical problem solving&quot;</td>
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<tr>
<td>April 2-5, 2000</td>
<td>44th Annual Convention of the American Institute of Ultrasound in Medicine, San Francisco, CA</td>
<td>- &quot;Three-dimensional ultrasound: Clinical applications&quot; (categorical course)</td>
</tr>
<tr>
<td>May 22-26, 2000</td>
<td>The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ</td>
<td>- &quot;Sonohysterography 2000&quot;</td>
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**JI-BIN LIU, M.D.**

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<tr>
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<tr>
<td>July 16, 1999</td>
<td>First Hospital of the Shanxi Medical University, Taiyuan, Shanxi</td>
<td>- &quot;Ultrasound guided radiofrequency ablation of liver tumors&quot;</td>
</tr>
<tr>
<td>October 21, 1999</td>
<td>5th National Ultrasound Symposium of Chinese Medical Association, Wuhan, China</td>
<td>- &quot;Ultrasound-guided radiofrequency ablation of liver tumors&quot;</td>
</tr>
<tr>
<td>November 28-December 3, 1999</td>
<td>85th Scientific Assembly and Annual Meeting of the Radiologic Society of North America, Chicago, IL</td>
<td>- &quot;3-D intravascular ultrasound: Preliminary clinical studies&quot;</td>
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<tr>
<td>February 23, 2000</td>
<td>Drexel-Jefferson Academic Alliance Course for Biomedical Engineering, Philadelphia, PA</td>
<td>- &quot;Intraoperative ultrasound&quot;</td>
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<td>- &quot;2D and 3D endoluminal ultrasound&quot;</td>
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<tr>
<td>March 7, 2000</td>
<td>Peking Union Medical College Hospital, Beijing, China</td>
<td>- &quot;Ultrasound-guided radiofrequency ablation of liver tumors&quot;</td>
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<tr>
<td>March 10, 2000</td>
<td>Ultrasound Seminar for Liver Cancer Research Group, Shanghai, China</td>
<td>- &quot;Clinical applications of ultrasound-guided RF ablation of liver tumors&quot;</td>
</tr>
<tr>
<td>March 13, 2000</td>
<td>Beijing Tumor Institute, Beijing, China</td>
<td>- &quot;Review of ultrasound-guided RF ablation of liver tumors&quot;</td>
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<tr>
<td>April 2-5, 2000</td>
<td>44th Annual Convention of American Institute of Ultrasound In Medicine, San Francisco, CA</td>
<td>- &quot;Clinical applications in vascular imaging&quot; (categorical courses)</td>
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<td>- &quot;The role of transureteral sonography for endopyelotomy guidance&quot; (exhibit)</td>
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<td>May 6-10, 2000</td>
<td>9th Congress of the World Federation for Ultrasound in Medicine and Biology, Florence, Italy</td>
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June 27, 2000

JUREI/Agilent China Special Ultrasound Education Program, Philadelphia, PA

• "Interventional procedures and ultrasound-guided therapy"

ANDREW D. MAIDMENT, PH.D.

July 29, 1999

41st Annual Meeting of the American Association of Physicists in Medicine, Nashville, TN

• "Quality assurance in Teleradiology/PACS: Implications on system design and maintenance"

November 28 - December 3, 1999

85th Scientific Assembly and Annual Meeting of the Radiologic Society of North America, Chicago, IL

• "A new slanted-edge MTF calculation method"

June 8-11, 2000

Era of Hope, Department of Defense Breast Cancer Research Meeting, Atlanta, GA

• "A clinical study of calcifications imaged by 2-D and 3-D digital mammography"
• "3-D digital mammography: An automated method of image reconstruction"
• "3-D digital mammography: A comparison of image reconstruction methods"

June 12-14, 2000

5th International Workshop on Digital Mammography, Toronto, Canada

• "Accuracy of digital mammography vs. screen-film mammography in a diagnostic mammography population"
• "Beam optimization for digital mammography"
• "Evaluation of a mammography simulation"
• "Automated reconstruction of 3-D calcifications"

June 29, 2000

Imaging 2000, Stockholm, Sweden

• "Imaging of the female breast"

CHRISTOPHER R.B. MERRITT, M.D.

September 17-19, 1999

29th Annual Meeting of the Australasian Society for Ultrasound in Medicine, Adelaide, Australia

• "Artifacts in diagnostic ultrasound"
• "Clinical experience with ultrasound contrast agents"
• "Obstetrical Doppler ultrasound"
• "Ultrasound evaluation of transplants"
• "Practical ultrasound safety and bioeffects"

September 25, 1999

Annual Meeting of the American College of Radiology, Washington, D.C.

• "The breast nodule - ultrasound evaluation" (categorical course)
<table>
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<tr>
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</table>
| October 1, 1999 | Society of Radiologists in Ultrasound, Chicago, IL  
• "Importance of ultrasound accreditation"  |
| October 27, 1999 | University of Massachusetts Grand Rounds, Worcester, MA  
• "New developments in breast ultrasound"  |
| November 3, 1999 | Albert Einstein University, Philadelphia, PA  
• "Annual Harold Isard Memorial Lecture - Ultrasound in the breast: Current and future applications"  |
| April 2, 2000 | American Institute of Ultrasound in Medicine, San Francisco, CA  
• "Understanding Doppler" (meet the professor)  |
| April 6, 2000 | Yale University Grand Rounds, New Haven, CT  
• "New directions in breast ultrasound"  |
| May 6-10, 2000 | 9th Congress of the World Federation of Ultrasound in Medicine and Biology, Florence, Italy  
• "Ultrasound in the new millennium. Impact of new technology"  |
| May 22-26, 2000 | The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ  
• "Symposium on contrast agents. Clinical Experience with SonoRx"  
• "New directions in breast ultrasound"  |

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

<table>
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<tr>
<th>Date</th>
<th>Event Details</th>
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</table>
| October 13, 1999 | New York University Advanced MRI Course, New York, NY  
• “Pancreatic MRI MRCP (liver contrast agents)”  |
| November 28-December 3, 1999 | 85th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL  
• “Categorical course in diagnostic radiology: Body MR”  |
| January 16, 2000 | MRAD: Magnetic Resonance Advocates Development, Orlando, FL  
• “Evaluating liver disease: MR’s future is now”  |
| April 1-7, 2000 | 8th Annual Scientific Meeting and Exhibition of the International Society of Magnetic Resonance in Medicine, Denver, CO  
• “Introductory MRI: Pulse sequences for body MRI”  
• “Categorical course: Liver MRI”  
• “Inferior phrenic arteries: Depiction with thin-section three-dimensional contrast-enhanced dynamic MR imaging with fat suppression”  |

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

<table>
<thead>
<tr>
<th>Date</th>
<th>Event Details</th>
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</table>
| October 9-10, 1999 | 5th Annual Jefferson Foot, Ankle and Knee Imaging Symposium, Jefferson Medical College, Philadelphia, PA  
• “Infection of the foot and ankle”  
• "MRI of cartilage and marrow of the knee"  
• "MR arthrography of the knee"  |
October 12, 1999
Department of Radiology, Albert Einstein Hospital, Philadelphia, PA
- "Imaging of arthritis"

October 27, 1999
Managed Imaging Network, Carlisle, PA
- "MRI of the shoulder: A clinically oriented approach"

November 28-December 3, 1999
85th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- "Rapidly acquired T1-weighted MR images used as a screening tool for vascular necrosis of the hip: A subspecialty training, sensitivity and cost analysis"
- "Image-guided rib biopsy: Accuracy, safety and comparison of histologic findings"

January 19, 2000
University of Texas Health Science Center at San Antonio, San Antonio, TX
- "Approach to thoracolumbar trauma"
- "CT/MR of spinal infection"

February 3, 2000
Philadelphia Roentgen Ray Society, Blue Ribbon Lecture, Philadelphia, PA
- "Imaging of shoulder instability"

April 1-7, 2000
8th Annual Scientific Meeting and Exhibition of the International Society for Magnetic Resonance in Medicine, Denver, CO
- "MRI of the ankle in asymptomatic professional ballet dancers" (poster)
- "Giant cell tumor of bone: Enhancement pattern on MR imaging" (poster)
- "Septic and nonseptic olecranon bursitis: MR imaging characteristics" (poster)

April 26, 2000
Department of Radiology, Fitzgerald Mercy Catholic Medical Center, Philadelphia, PA
- "Imaging of arthritis"

April 29, 2000
Fourth Annual Jefferson Shoulder, Elbow and Wrist Advanced Imaging Symposium, Jefferson Medical College, Philadelphia, PA
- "MRI of the acromioclavicular joint"
- "MRI of instability"
- "MRI of the elbow"

May 11, 2000
100th Annual Scientific Meeting of the American Roentgen Ray Society, Washington, DC
- "MRI of the hip and pelvis"

LEVON N. NAZARIAN, M.D.

October 10, 1999
5th Annual Jefferson Foot, Ankle & Knee Advanced Imaging Symposium, Philadelphia, PA
- "Ultrasound of ankle disorders"
October 15, 1999
Philadelphia Dermatological Society, Philadelphia, PA
- "Ultrasound: Selected applications in skin disease"

January 6, 2000
Philadelphia Roentgen Ray Society, Blue Ribbon Lecture, Philadelphia, PA
- "CT of focal liver masses"

February 1, 2000
New York Methodist Hospital Grand Rounds, Brooklyn, NY
- "Essential features of musculoskeletal ultrasound"

April 2-5, 2000
44th Annual Convention of the American Institute of Ultrasound in Medicine, San Francisco, CA
- "Kidney Transplants" (categorical course)

April 13, 2000
Department of Radiology, Bryn Mawr Hospital, Bryn Mawr, PA
- Case Presentation

April 29, 2000
Fourth Annual Jefferson Shoulder, Elbow and Wrist Advanced Imaging Symposium, Jefferson Medical College, Philadelphia, PA
- "Shoulder sonography"

May 22-26, 2000
The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
- "Overview of musculoskeletal ultrasound"
- "Ultrasound of the foot and ankle"
- "Ultrasound of soft tissue masses; interventions in musculoskeletal ultrasound"

LAURENCE NEEDLEMAN, M.D.

September 25, 1999
Annual Meeting of the American College of Radiology, Washington, D.C.
- "Renal artery stenosis" (categorical course)

October 4, 1999
Washington University School of Medicine, Mallinckrodt Institute of Radiology, Saint Louis, MO
- "Vascular interpretation" (visiting professor)
Annual Leland Melson Memorial Lecture
- "Contrast agents"

November 19, 1999
Advances in Vascular Diagnosis and Vascular Laboratory Management, sponsored by Montefiore Hospital, New York, NY
- "Update on contrast agents, harmonic imaging and other technological innovations"
- "Carotid duplex interpretation"

November 28-
December 3, 1999
85th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- "Evaluation of hepatic metastatic disease: CT, MR, and US: US"
- "Practical tips in US: Abdomen: Doppler"

January 21-23, 2000
2000 North Carolina-American College of Radiology Vascular Ultrasound Weekend Review Course, Charlotte, NC
- "Contrast enhanced/harmonic ultrasound imaging"
February 16, 2000
Hartford Hospital Grand Rounds, Hartford, CT
- "Liver Doppler/TIPS imaging"
- "Venous Doppler: Beyond the straightforward exam"
- "Graft surveillance/lower extremity arterial Doppler"

February 24, 2000
Department of Cardiology Grand Rounds, Deborah Heart and Lung Center, Browns Mills, NJ
- "The noninvasive vascular laboratory"

April 2-5, 2000
44th Annual Convention of the American Institute of Ultrasound in Medicine, San Francisco, CA
- "How to hands-on: Abdominal Doppler"
- "Lower extremity venous ultrasound"
- "Upper extremity venous ultrasound"

April 27, 2000
District of Columbia Metropolitan Radiological Society, Washington, D.C.
- Case Studies
- "Advances in ultrasound: Superficial and deeper"

May 5-6, 2000
23rd Annual Postgraduate Seminar in Diagnostic Ultrasound, Novi, Michigan
- "Interpretation of spectral and color Doppler I"
- "Interpretation of spectral and color Doppler II"
- "Interpretation of carotid Doppler studies"
- "Doppler evaluation of lower extremity arteries and grafts"

May 22-26, 2000
The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
- "Liver contrast imaging – sensitivity is the key"
- "Chronic venous evaluation"
- Case Review
- "Vascular case studies"

LAURENCE PARKER, PH.D.

November 28- December 3, 1999
85th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- "Trends in utilization of barium enemas and diagnostic colonoscopy from 1985 through 1997"
- "Variation in the rates of utilization of neuroimaging studies in different geographic regions of the USA"

CATHarINE W. PICCOLI, M.D.

December 10, 1999
Issues in Primary Care, Jefferson Healthcare College, sponsored by Thomas Jefferson University Hospital, Philadelphia, PA
- "Choosing the best test: Evaluation of patients with breast lumps"
April 2-5, 2000
44th Annual Convention of the American Institute of Ultrasound in Medicine, San Francisco, CA
- “Compound imaging of the breast”
- “Breast imaging and reporting system for ultrasound”

May 22-26, 2000
The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
- “Mammography-sonography correlation”
- “Ultrasound evaluation of breast implants”

VIJAY M. RAO, M.D.

October 20, 1999
Department of Radiology, Mercy Catholic Medical Center, Fitzgerald Division, Darby, PA
- “Sinonasal imaging”

November 28-December 3, 1999
85th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- “The sinonasal cavities and the ostiomeatal complex: The ostiomeatal complex” (refresher course)
- “Turf battles in radiology: How to fight them and win!” (refresher course)
- “Participation by emergency medicine physicians in the performance of conventional radiography done in emergency departments”
- “Variation in the rates of utilization of neuroimaging studies in different geographic regions of the USA”

January 27, 2000
Department of Radiology, The Bryn Mawr Hospital, Bryn Mawr, PA
- “Interesting head and neck cases”

April 30, 2000
Department of Radiology, Stanford University, Palo Alto, CA
- “Head and neck board review”

May 4-7, 2000
Annual Meeting of the ASHNR & ESHNR Joint International Conference and Symposium, Atlanta, GA
- “Imaging of the TMJ and mandible”
- “Extracranial schwannomas of the head and neck: Imaging and pathologic features” (poster presentation)

ANA M. SALAZAR, M.D.

September 17, 1999
Joint Scientific Sessions of the Pennsylvania and New Jersey Thoracic Societies, Philadelphia, PA
- “High resolution CT of the lungs: A practical approach”

February 18, 2000
Pulmonary and Critical Care Medicine Grand Rounds, MCP Hahnemann University, MCP Campus, Philadelphia, PA
- “HRCT of the lung”
MARK E. SCHWEITZER, M.D.

July 26, 1999
Armed Forces Institute of Pathology, Washington, DC
- "MRI of the foot and ankle"

July 30-31, 1999
9th Seminar of Japanese Musculoskeletal Radiology, Hokkaido University, Sapporo, Japan
- "Imaging of musculoskeletal infectious diseases"
- "Imaging of the peripheral extremities"

August 19, 1999
International Skeletal Society, Seattle, WA
- "Diabetic foot"

September 22, 1999
Armed Forces Institute of Pathology, Washington, DC
- "MRI of the foot and ankle"

October 9-10, 1999
5th Annual Jefferson Foot, Ankle and Knee Imaging Symposium, Jefferson Medical College, Philadelphia, PA
- "MRI of the menisci"
- "MRI of knee ligament tears"
- "MRI of ankle ligament and adjacent soft tissue"
- "Advanced MRI of tendons"
- "Marrow disorders of the ankle"
- "MRI of the foot"

October 11, 1999
MRI: Clinical State-of-the-Art, New York University Post-Graduate Medical School, New York, NY
- "Ankle ligaments and tendons I"
- "Ankle ligaments and tendons II"
- "MRI of the foot"

October 22, 1999
1999 Workshop-Symposium State-of-the-Art, New York University Post-Graduate Medical School, New York, NY
- "Ankle ligaments and tendons I"
- "Ankle ligaments and tendons II"
- "MRI of the foot"

November 11, 1999
Department of Radiology, Cooper Hospital, and the Radiological Society of New Jersey, Camden, NJ
- "MRI of muscular disease"

January 11, 2000
Western Massachusetts Radiological Society, Springfield, MA
- "MRI of the foot and ankle"

January 12, 2000
Department of Radiology, University of Connecticut, Framingham, CT
- "Knee ligament injuries"
- "Marrow disorders of the foot and ankle"

January 20, 2000
Temple University School of Podiatric Medicine, Philadelphia, PA
- "MRI of ankle marrow"

February 1, 2000
Armed Forces Institute of Pathology, Washington, DC
- "MRI of the foot and ankle"
March 14, 2000  
Armed Forces Institute of Pathology, Washington, DC  
- "MRI of the foot and ankle"

March 22, 2000  
Temple University School of Podiatry Medicine, Philadelphia, PA  
- "MRI of the foot and ankle"

April 1-7, 2000  
8th Annual Scientific Meeting and Exhibition of the International Society for Magnetic Resonance in Medicine, Denver, CO  
- "Indirect MR arthrography with intravenous gadolinium"

April 11, 2000  
Armed Forces Institute of Pathology, Washington, DC  
- "MRI of the foot and ankle"

April 29, 2000  
Fourth Annual Jefferson Shoulder, Elbow and Wrist Advanced Imaging Symposium, Jefferson Medical College, Philadelphia, PA  
- "Direct and indirect MR arthrography"
- "Post-operative shoulder imaging"
- "Imaging of the TFCC, SL and LT ligaments"
- "Imaging of the wrist and marrow"

May 11, 2000  
100th Annual Scientific Meeting of the American Roentgen Ray Society, Washington, DC  
- "Advanced imaging of the hip"

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

May 22-26, 2000  
The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ  
- Stump the stars

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

August 24, 1999  
Air Force Institute of Pathology, 6 Week Radiology Course, Washington, DC  
- "Usual and unusual pulmonary infections"

October 21, 1999  
Air Force Institute of Pathology, 6 Week Radiology Course, Washington, DC  
- "Usual and unusual pulmonary infections"

November 28 - December 3, 1999  
85th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL  
- "Spectrum of pulmonary infections associated with multifocal bronchiectasis and centrilobular nodules"

May 11, 2000  
American Roentgen Ray Society, Washington DC  
- "Pulmonary manifestations of HIV infection"
- "Spectrum of CT findings in nosocomial pseudomonas aeruginosa pneumonia"

May 15, 2000  
Air Force Institute of Pathology, 6 Week Radiology Course, Washington, DC
• “Usual and unusual pulmonary infections”

WILLIAM T. SHI, PH.D.

October 18, 1999
1999 IEEE International Ultrasonics Symposium, Lake Tahoe, NV
• “Implementation of subharmonic imaging”
• “Blood flow estimation with harmonic flash echo imaging”

November 28-December 3, 1999
85th Scientific Assembly and Annual Meeting of the Radiologic Society of North America, Chicago, IL
• “Noninvasive pressure estimation with US microbubble contrast agents”
• “Nonlinear subharmonic imaging with US microbubble contrast agents”

February 4, 2000
5th International Ultrasound Contrast Research Symposium in Radiology, San Diego, CA
• “Excitation enhanced ultrasound contrast imaging”

April 2-5, 2000
44th Annual Convention of the American Institute of Ultrasound in Medicine, San Francisco, CA
• “Experimental investigation of the persistence of US contrast imaging enhancement”
• “Do US microbubble contrast agents induce cavitational bioeffects?”

April 5, 2000
Acuson Corporation, Mountain View, CA
• “Nonlinear ultrasound contrast imaging”

May 6-10, 2000
9th Congress of the World Federation for Ultrasound in Medicine and Biology, Florence, Italy
• “Subharmonic imaging with microbubble contrast agents”

May 23, 2000
6th Annual International Symposium on Contrast Agent in Diagnostic Ultrasound, Atlantic City, NJ
• “The destruction of contrast microbubbles and the association with inertial cavitation”

May 31, 2000
23rd Annual Conference for Ultrasound in Biophysics and Bioengineering, Allerton Park, Monticello, IL
• “The destruction of contrast microbubbles and the effects on ultrasound imaging”

MATHEW L. THAKUR, PH.D.

September 1-4, 1999
4th International Symposium on VIP, PACAP, Glucagon, and Related Peptides, Elsinore, Denmark
• “Imaging tumors in humans with Tc99m-VIP”

October 9-13, 1999
The European Association of Nuclear Medicine Congress, Barcelona, Spain
• “Imaging radioimmunodetection of tumors: Influence of the quantity of IFN:MAb conjugate”
October 20-23, 1999  
9th International Society of Radiolabeled Blood Elements, Rio de Janeiro, Brazil
- "Imaging vascular thrombosis: Role of radiolabeled peptides"
- "Tc-99m-labeled chemotactic peptides for imaging infection"

October 24-28, 1999  
The XVI Congress of the Association of Latin American Societies of Nuclear Medicine and Biology, Buenos Aires, Argentina
- "Tc-99m-VIP for imaging tumors in humans"
- "New radiopharmaceuticals in infection"
- "Tc-99m labeled peptides for imaging infection/inflammation"
- "Thrombospondin and fibrin specific peptides for imaging vascular thrombosis"
- "New radiopharmaceuticals of infection/inflammation"

November 1-5, 1999  
The International Atomic Energy Agency 3rd Research Coordinators Meeting of the Coordination Research Programme on "Tc-99m Peptides for Imaging of Peripheral Receptors", Buenos Aires, Argentina
- "Radiopharmaceutical probes for imaging"

December 8-11, 1999  
The XXXI Annual Conference of the Society of Nuclear Medicine, India, Madurai, India
- "Imaging tumors with Tc-99m-VIP"

February 23, 2000  
Bracco Inc., Princeton, NJ
- "Novel radiopharmaceuticals at Thomas Jefferson University"

February 29, 2000  
Diatide Inc., Londondery, NH
- "Tc-99m-VIP for imaging breast tumors"

April 14-16, 2000  
The Mid-Eastern Chapter of the Society of Nuclear Medicine 30th Annual Spring Meeting, Williamsburg, VA
- "New radiopharmaceuticals"

May 25-28, 2000  
The Rome 2000 Jubilee Symposium on Radiopharmaceuticals in Diagnosis and Therapy, Rome, Italy
- "Reducing renal uptake of radiolabeled peptides"

**TERRI TUCKMAN, M.D.**

May 22-26, 2000  
The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
- Stump the Stars

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

October 9-10, 1999  
5th Annual Jefferson Foot, Ankle and Knee Imaging Symposium, Jefferson Medical College, Philadelphia, PA
- "Hindfoot fractures"

March 16, 2000  
Bryn Mawr Hospital, Bryn Mawr, PA
• "Emergency chest CT"

ANNINA N. WILKES, M.D.

October 12, 1999
Annual Meeting of Gastrointestinal Radiologists, Kampala, Uganda
• "Pelvic pain"
• "Endoscopic ultrasound"

February 10, 2000
Mammography Society of Philadelphia, Philadelphia, PA
• "Breast ultrasound"

May 9, 2000
Stat Resources, Langhorne, PA
• "Breast ultrasound"

May 22-26, 2000
The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
• "Approach to breast ultrasound"
HONORS, EDITORIAL ACTIVITIES, SERVICE TO REGIONAL OR NATIONAL ORGANIZATIONS

JOSEPH BONN, M.D.

- Member, Executive Council Advisory Committee, Society of Cardiovascular and Interventional Radiology
- Member, Committee on Transcatheter Therapy of Peripheral Vascular Disease, Council on Cardiovascular Radiology, American Heart Association
- 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*
- Abstract Reviewer, 25th Annual Meeting of the Society of Cardiovascular and Interventional Radiology
- Abstract Reviewer, 73rd American Heart Association Scientific Sessions

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
- Abstract Reviewer, 44th Annual Convention of the American Institute of Ultrasound in Medicine
- Reviewer, *American Journal of Roentgenology*
- Reviewer, *Clinical Imaging*
- Reviewer, *Journal of the American Medical Association*
- Reviewer, *Journal of Clinical Ultrasound*
- 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, InfoRad Exhibits Committee, 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*

FLEMING FORSBERG, PH.D.

- Chairperson, Doppler Subcommittee, Technical Standards Committee, American Institute of Ultrasound in Medicine
- Vice-Chair, Technical Standards Committee, 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, *Ultrasonic Imaging*
- Reviewer, *Ultrasound in Medicine and Biology*
- "Best Non-Clinical Paper" Award, *Journal of Ultrasound in Medicine and Biology*, 1999 (co-author)

DAVID P. FRIEDMAN, M.D.

- Co-Director, Philadelphia Neuroradiology Club
- Member, Exhibits Committee, 85th 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, *Cardiovascular and Interventional Radiology*
- Reviewer, *Journal of Vascular and Interventional Radiology*

BARRY B. GOLDBERG, M.D.

- Annual Oration in Diagnostic Radiology, Radiological Society of North America
- Chairman, Archives Committee, American Institute of Ultrasound in Medicine
• Chairman, Archives Committee, World Federation for Ultrasound in Medicine and Biology
• “Laurea ad honorem” (Honorary Doctorate of Medicine and Surgery), University of Bologna, Italy
• Honored Radiologist (Gold Medal Award), The Pennsylvania Radiological Society
• 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, Outstanding Researcher Award Review Panel, Research and Education Fund, Radiological Society of North America
• Member, Administrative Council, World Federation for Ultrasound in Medicine and Biology
• Member, Public Information Advisory Board, Radiological Society of North America
• Member, Research and Education Fund Committee, American Institute of Ultrasound in Medicine
• Member, Advisory Board, NICER Institute
• Member, Fiftieth Anniversary Committee, American Institute of Ultrasound in Medicine
• Honorary Member, Mongolian Society of Diagnostic Ultrasound
• Member, International Advisory Board, Indian Journal of Medical Ultrasound
• Member, Advisory Committee, Ultrasonidos en Medicina
• Member, Editorial Committee, Journal Ultrasonido
• Editorial Board, Advances in Echo Enhancement
• Editorial Board, Archives of Clinical Imaging
• Editorial Board, Clinics in Diagnostic Ultrasound
• Editorial Board, Journal of Ultrasound in Medicine
• Editorial Board, Journal of Ultrasound in Medicine and Biology
• Editorial Board, Journal of Surgical Ultrasonology
• Editorial Board, Journal d'Echo Graphie et de Medicine Ultrasonore
• Editorial Board, Radiologia
• Editorial Board, Ultrasound International Journal
• Editorial Advisor, Journal d'Echographie et de Medicine 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, Health Devices
• Reviewer, Journal of the National Cancer Institute
• Reviewer, Radiology
• “Best Non-Clinical Paper” Award, Journal of Ultrasound in Medicine and Biology, 1999 (co-author)

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

GEORGE A. HOLLAND, M.D.

• 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, *Radiology*

DAVID KARASICK, M.D.

- Member, Musculoskeletal Review Committee, American Board of Radiology
- Member, Closed Meeting Case Review, International Skeletal Society
- Member, Liaison Future Planning Committee, International Skeletal Society
- Member, Scientific Exhibits Award Committee, American Roentgen Ray Society
- Editor-in-Chief, *Seminars in Musculoskeletal Radiology* (Thieme Publishing Co.)
- Consulting Editor, *Skeletal Radiology*
- Book Reviewer, *American Journal of Roentgenology*
- Manuscript Reviewer, Musculoskeletal Radiology, *American Journal of Roentgenology*
- Manuscript Reviewer, Musculoskeletal Radiology, *Radiographics*
- Manuscript Reviewer, Musculoskeletal Radiology, *Radiology*

STEPHEN KARASICK, M.D.

- 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, Nuclear Medicine Science Committee, American College of Nuclear Physicians
- Member, Radiopharmaceutical Affairs Committee, American College of Nuclear Physician
- Reviewer, *Journal of Nuclear Medicine*

ALFRED B. KURTZ, M.D.

- President-elect, 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, Ultrasoundography, *Radiology*
- Editorial Board, *Journal of Women's Imaging*
- Editorial Board, *Journal of Ultrasound in Medicine*
- Member, Manuscript Review Panel, *AJR*
- Manuscript Reviewer, Ultrasoundography, *Radiology*
- 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*

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

- Memorial Lecture Award of the Chicago Radiological Society
- 14th Annual Castele Lecture of the Cleveland Radiological Society and University Hospitals of Cleveland, Cleveland, OH
- 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
- 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, Publications Committee, Pennsylvania Radiological Society
- Member, Research and Education Fund Program Committee, Radiological Society of North America
- Member, Refresher Course Committee, Radiological Society of North America
- Member, Radiology Advisory Committee, Keystone Health Plan East (HMO)
- Consultant, Independence Blue Cross
- Member, Public Relations and Marketing Committee, Pennsylvania Radiological Society
- Member, Program Committee for the Annual Meeting, Pennsylvania Radiological Society
- Member, Editorial Advisory Board, *American Journal of Roentgenology*
- Reviewer, *American Journal of Roentgenology*
- Reviewer, *Radiology*

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

- Book Reviewer, *American Journal of Roentgenology*
- Reviewer, *American Journal of Roentgenology*
- Reviewer, *Obstetrics and Gynecology*
- Reviewer, *Radiology*
- Reviewer, *Ultrasound in Obstetrics and Gynecology*
- Honorable Mention, “Three-Dimensional Multiplanar Sonohysterography: Comparison with Conventional Two-Dimensional Sonohysterography and X-ray Hysterosalpingography” (poster), 44th Convention of the American Institute of Ultrasound in Medicine, San Francisco, CA, April 2000.

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

- Guest Professorship, Shanxi Medical University
• Editorial Board, Chinese Journal of Medical Imaging Technology
• Reviewer, Ultrasound in Medicine and Biology
• Honorable Mention, "The role of transureteral sonography for endopyelotomy guidance" (exhibit), 44th Annual Convention of American Institute of Ultrasound in Medicine, San Francisco, CA, April 2000

ANDREW D.A. MAIDMENT, M.D.

• Phantom Reviewer, Stereotactic Breast Biopsy Accreditation Program, American College of Radiology
• Chairman, Task Group 16: Noise Power Spectrum Analysis, American Association of Physicists in Medicine
• Member and Chair, Organizing Committee, 5th International Workshop on Digital Mammography, Toronto, Canada
• Member and Chair, Organizing Committee, Physics Medical Imaging, Medical Imaging 2000, SPIE, San Diego, CA
• Member, Committee on Correlation of Phantom and Clinical Imaging Quality, 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, Local Organizing Committee and TJUH site visit coordinator, SCAR-2000, Society of Computer Applications in Radiology, Philadelphia, PA
• Associate Editor, Medical Physics
• Editorial Advisory Committee, American Journal of Roentgenology
• Proffered Presentation Reviewer, 42nd Annual Meeting of the American Association of Physicists in Medicine
• 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
• President (1999), Past President (2000), Society of Radiologists in Ultrasound
• Treasurer, World Federation of Ultrasound in Medicine and Biology
• Category Chair, Ultrasound, American Board of Radiology
• Member, Executive Council, American Roentgen Ray Society
• Member, Board of Chancellors, American College of Radiology
• Member, Written Committee Chair, Radiation Biology
• Editor, World Federation for Ultrasound in Medicine and Biology News. Newsletter of the World Federation for Ultrasound in Medicine and Biology
• Contributing Editor, Ultrasound Quarterly
• Contributing Editor, Breast Diseases 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, American Journal of Roentgenology
• Reviewer, Cancer
• Reviewer, Radiology
• Reviewer, Ultrasound in Medicine and Biology

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, Syllabus Panel – Magnetic Resonance II, American College of Radiology
• Member, Committee on Research & Technology Assessment, Commission on Neuroradiology & Magnetic Resonance, American College of Radiology
• Member, MRI Committee, American College of Radiology Imaging Network
• Member, Scientific Program Committee, International Society for Magnetic Resonance in Medicine
• Editorial Board, Abdominal Imaging
• Editorial Board, Journal of Computer Assisted Tomography
• Associate Editor, Journal of Magnetic Resonance Imaging
• Top Doctors List, Philadelphia Magazine
• Abstract Reviewer, 8th Meeting of the International Society for Magnetic Resonance in Medicine
• Reviewer, Abdominal Imaging
• Reviewer, Academic Radiology
• Reviewer, American Journal of Roentgenology
• Reviewer, Radiographics
• Editor's Certificate of Recognition, Radiographics
• Editor's Certificate of Recognition, Radiology

WILLIAM B. MORRISON, M.D.

• Co-Coordinator and Panelist, Delaware Valley Orthopedic-Radiologic-Pathology Conference
• Teacher of the Year Award, Department of Radiology, Thomas Jefferson University Hospital
• Reviewer, American Journal of Roentgenology
• Reviewer, Radiology
• Awarded Best Scientific Presentation, "Magnetic Resonance Imaging at Different Time Intervals Following Hamstring Harvest for Anterior Cruciate Ligament Reconstruction" (poster), 22nd Annual Meeting of the Society of Skeletal Radiology, Scottsdale, AZ, March 1999

LEYON N. NAZARIAN, M.D.

• Editorial Board, Seminars in Musculoskeletal Radiology
• Reviewer, American Journal of Roentgenology
• Reviewer, Clinical Orthopaedics and Related Research
• Reviewer, Radiology
LAURENCE NEEDLEMAN, M.D.

- Fellow, American College of Radiology, September, 1999
- Vice-Chair, Corporate Affairs Committee, Society of Radiologists in Ultrasound
- Member, Committee on Standards and Accreditation, Commission on Ultrasound, American College of Radiology
- Member, Expert Panel on Cardiovascular Imaging, Task Force on Appropriateness Criteria, American College of Radiology
- Leland Melson Visiting Lecturer, Mallinckrodt Institute of Radiology, Washington University School of Medicine, October, 1999
- "Best Non-Clinical Paper" Award, *Journal of Ultrasound in Medicine and Biology*, 1999 (co-author)

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

VIJAY M. RAO, M.D.

- Member, Board of Directors, Association of Program Directors in Radiology
- Secretary-Treasurer, Association of Program Directors in Radiology
- Secretary, American Society of Head and Neck Radiology
- Chairperson, Curriculum Committee, Association of Program Directors in Radiology
- Chairperson, Consensus Conference, Research and Education Fund, Radiological Society of North America
- Chairperson, Awards Committee, 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, 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, 85th 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, 38th Annual Meeting of the American Society of Neuroradiology
- Reviewer, *American Journal of Roentgenology*
- Reviewer, *Neuroradiology*
- Reviewer, *Radiographics*
- 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
- 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
- Co-Editor-in-Chief, Seminars in Musculoskeletal Imaging
- Editorial Board, Skeletal Radiology
- Member, Advisory Panel, Food and Drug Administration
- Member, Expert Panel, Orthopedic Radiology, Pathology Society
- 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
- Editor’s Recognition Award for Special Distinction in Reviewing, Radiographics
- Editor’s Recognition Award for Special Distinction in Reviewing, 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
- “Best Non-Clinical Paper” Award, Journal of Ultrasound in Medicine and Biology, 1999 (co-author)

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, Journal of Vascular and Interventional Radiology
- Reviewer, Radiology
LISA M. TARTAGLINO, M.D.

- Co-Director, Philadelphia Neuroradiology Club
- Reviewer, Radiology

MATHEW L. THAKUR, PH.D.

- Society of Nuclear Medicine George de Hevesy Award, June 4th, 2000
- Delegate-at-large, The Society of Nuclear Medicine
- Member, Board of Governors, Greater New York Chapter, The Society of Nuclear Medicine
- Program Sub-Chair, The Annual Meeting of The European Association of Nuclear Medicine
- Member, Advisory Committee, International Atomic Energy Agency
- Member, Advisory Committee, Kuwait Medical Research Council
- Member, Advisory Committee, Laurence Berkeley National Laboratory
- Associate Editor, Cancer Research
- 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
- Reviewer, Scientific Exhibits, 48th Annual Meeting of the Society of Nuclear Medicine, St. Louis, 2000
- 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, 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 Dependent Care, American Medical Women's Association
- Chair, Personal Development Committee, American Medical Women's Association
- Co-Chair, Women Physicians' Forum
- Member, Committee on Gender Equity, American Medical Women's Association
- Member, Committee on Maternity and Medicine, American Medical Women's Association
- Member, Strategic Planning Committee, American Medical Women's Association

RICHARD J. WECHSLER, M.D.

- President, Philadelphia Roentgen Ray Society
• Councilor, American College of Radiology
• Member, Board of Directors, Pennsylvania Radiological Society
• Member, Executive Board, Philadelphia Roentgen Ray Society
• Member, Education Program Committee, Philadelphia Roentgen Ray Society
• Member, Budget Committee, Philadelphia Roentgen Ray Society
• Member, Annual Oration Committee, Philadelphia Roentgen Ray Society
• Member, Nominating Committee, Pennsylvania Radiological Society
• Reviewer, *Radiology*

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

• State Director, American Medical Women’s Association

**ELAINE WOLK, M.D.**

• Member, Clinical Image Reviewer Subcommittee, Mammography Accreditation Program, American College of Radiology
APPENDIX

Table 1  ACTIVE GRANTS
Table 2  PENDING GRANTS
## NIH/OTHER FEDERAL GRANTS

<table>
<thead>
<tr>
<th>PRINCIPAL INVESTIGATOR</th>
<th>TITLE OF PROJECT</th>
<th>FUNDING SOURCE</th>
<th>FUNDING DATES</th>
<th>DIRECT COSTS</th>
<th>INDIRECT COSTS</th>
<th>TOTAL FUNDED COSTS</th>
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<tr>
<td>Consigny, P.M.</td>
<td>Re-Endothelialization of Arteries after Angioplasty</td>
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<td>$66,651</td>
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<pre><code>                    |                                                                                  | (current fiscal yr)     |                           | (current fiscal yr) | (current fiscal yr) |                   |
</code></pre>
<p>| Feig, S.               | Stereotactic Breast Biopsy Versus Open Surgical Biopsy (RDOG V)                  | NIH                     | 09/30/93 - 07/31/99       | $7,147        | $4,600         | $11,747           |
| (subcontract) UNC      |                                                                                  | 5 U01 CA62476           | 04 year                   | $309          | $191           | $500              |</p>
|                        |                                                                                  |                         |                           | (current fiscal yr) | (current fiscal yr) | (current fiscal yr) |}
<p>| Forsberg, F.           | Contrast Enhanced 3D Color Amplitude Imaging of Breasts                          | U.S. Army Medical       | 09/15/97 - 09/14/00       | $131,493      | $79,987        | $211,480          |
| X06101                 |                                                                                  | Research Acq.           |                           |               |               |                   |
|                        |                                                                                  |                         |                           | $43,831       | $26,662        | $70,493           |
|                        |                                                                                  | (current fiscal yr)     |                           | (current fiscal yr) | (current fiscal yr) |                   |
| Forsberg, F.           | System for Excitation Enhanced Ultrasound Contrast Imaging                       | NIH/SBIR Spectrasonics | 05/01/99 - 10/31/99       | $20,084       | $12,249        | $32,333           |
| Z16801                 |                                                                                  | Imaging, Inc.           |                           |               |               |                   |
|                        |                                                                                  |                         |                           | $13,557       | $7,999         | $21,556           |
|                        |                                                                                  | (current fiscal yr)     |                           | (current fiscal yr) | (current fiscal yr) |                   |
| Goldberg, B.           | Breast Cancer Detection Using Ultrasound Contrast                                | NIH                     | 04/01/96 - 01/31/01       | $700,981      | $456,914       | $1,157,895        |
| R38604/5               |                                                                                  | 1 RO1 CA60854           | 04 year                   |               |               |                   |
|                        |                                                                                  |                         |                           | $209,950      | $127,160       | $337,110          |
|                        |                                                                                  | (current fiscal yr)     |                           | (current fiscal yr) | (current fiscal yr) |                   |
| Goldberg, B.           | Developing of Tissue Characterization Methods                                    | NIH                     | 07/01/98 - 06/30/02       | $201,987      | $182,976       | $384,963          |
| Z10803                 |                                                                                  | 2 PO1 CA52823           | 08 year                   |               |               |                   |
| (subcontract) Drexel (J. Reid) |                                                      |                         |                           | $24,188       | $14,997        | $39,185           |
|                        |                                                                                  | (current fiscal yr)     |                           | (current fiscal yr) | (current fiscal yr) |                   |</p>
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<th>Title</th>
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<th>R01</th>
<th>Years</th>
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<th>Budget (current fiscal yr)</th>
<th>Budget (current fiscal yr)</th>
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<td>Goldberg, B.</td>
<td>Development of a New Class of Ultrasound Contrast Agents</td>
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<td>Goldberg, B.</td>
<td>American College of Radiology Cooperative Group Imaging Network</td>
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<td>Liu, J.</td>
<td>Tumor Evaluation by 2D and 3D Endoluminal Ultrasound</td>
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<td>$8,518</td>
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<td>Clinical Evaluation of Digital Mammography</td>
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<td>Maitdment, A.</td>
<td>2D and 3D Digital Analysis of Breast Calcifications: A Technique to Improve Mammographic Specificity</td>
<td>U.S. Army Medical Research</td>
<td>DAMD17-96-1-6280</td>
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<td>3-Dimensional Imaging of the Breast</td>
<td>U.S. Army Medical Research</td>
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<td>In Vivo Evaluation of Elastography</td>
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<td>Mitchell, D. Z19201</td>
<td>Role of Radiology in the Pretreatment Evaluation of Invasive Cervical Cancer</td>
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<td>Piccoli, C. Z15301</td>
<td>High Frequency Two-Dimensional Ultrasonic Transducers</td>
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<td>Imaging Thromboembolism with Tc-99m-Peptide TP1201</td>
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**FOUN Dan ON/NO NON-PROFIT ORGANIZATION GRANTS**

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<td>The Design and Construction of a Novel Intravascular Stent and Deployment Device</td>
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<td>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</td>
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<td>Evaluation of the Efficacy of Using the Oral Contrast Agent SonoRx to Reduce Musculoskeletal Pain and Discomfort in Diagnostic Medical Sonographers</td>
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<td>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</td>
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<td>A Phase IIb, 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</td>
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<td>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</td>
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<td>$2,765</td>
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<td>Needelman, L. D89601</td>
<td>A Multi-Center Clinical Study to Establish the Prognostic Value of the Tissue Factor Clotting Time Assay (TiFaCT) in Predicting Venous Thromboembolism (VTE) Following General Abdominal or Orthopedic Surgery</td>
<td>Coagulation Diagnostics, Inc.</td>
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<td>$6,540</td>
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<td>Needelman, L. H09901</td>
<td>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</td>
<td>Nycomed, Inc.</td>
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<td>Schweitzer, M. D99301</td>
<td>Evaluation of the Effect of Therapeutic Ultrasound on Indirect MR Arthrography</td>
<td>Berlex Laboratories</td>
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<td>Sullivan, K. A29001</td>
<td>Prospective Multicenter Evaluation of Venaflo ePTFE Vascular Graft as Compared to IMPRA ePTFE Vascular Graft in Hemodialysis Applications</td>
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<td>Interferon-Alpha-2b for Improving Radioimmunoscintigraphy and Radioimmunotherapy</td>
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<td>LeuTech Product Development (Protocol #03970)</td>
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**TOTAL INDUSTRIAL FUNDING**: $3,485,024
**CURRENT YEAR FUNDING**: $931,728
**INDUSTRIAL FUNDING**: $2,553,296
**TOTAL FUNDING**: $8,043,088
**TOTAL CURRENT YEAR FUNDING**: $2,122,023
### NIH/OTHER FEDERAL GRANTS

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<tr>
<th>Principal Investigator</th>
<th>Title of Project</th>
<th>Funding Source</th>
<th>Funding Dates</th>
<th>Direct Costs</th>
<th>Indirect Costs</th>
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<td>Forsberg, F.</td>
<td>Estimation of Tumor Angiogenesis with Contrast-Enhanced Subharmonic Imaging</td>
<td>DOD</td>
<td>07/01/00 - 06/30/03</td>
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<td>NIH/SBIR Creare, Inc.</td>
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<td>A Novel Method for Determining Calcification Composition</td>
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<td>Digital Versus Screen-</td>
<td>ACRN</td>
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<td>Rapid Malignancy Assessment of Breast Biopsies</td>
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<td>Imaging Thromboembolism with Fibrin Avid Te-99m-Peptide</td>
<td>NIH/SCTR</td>
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<td>10/01/00</td>
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<td>Intracellular Auger Electron</td>
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<td>Cancer Therapy</td>
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**Notes:**
- (subcontract)
- Funding amounts are in dollars.
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<th>Thakur, M.</th>
<th>Intracellular Augur Electron Cancer Therapy</th>
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| TOTAL NIH GRANT FUNDING | $4,153,538 | $2,249,281 | $6,402,819 |
| TOTAL FIRST YEAR NIH FUNDING | $1,467,736 | $765,856  | $2,233,592 |
## Pending Grants
07/01/99 - 06/30/00
(Report reflects entire award period and first year of award)

### FOUNDATION/NON-PROFIT ORGANIZATION GRANTS

<table>
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<tr>
<th>PRINCIPAL INVESTIGATOR</th>
<th>TITLE OF PROJECT</th>
<th>FUNDING SOURCE</th>
<th>FUNDING DATES</th>
<th>DIRECT COSTS</th>
<th>INDIRECT COSTS</th>
<th>TOTAL COSTS FUNDED</th>
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<td>Goldberg, B.</td>
<td>Continuation of New Initiatives Program (Information Transfer/Communications Coordination)</td>
<td>Open Society Institute</td>
<td>01/01/00 - 12/31/00</td>
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<td>Comparison of Gadolinium Enhanced Ultrafast 3D-MRA and CT for the Evaluation of Aortic Stent Grafts</td>
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**TOTAL NON-PROFIT FUNDING**  
$429,450  
**TOTAL FIRST YEAR**  
$229,450  
**NON-PROFIT FUNDING**  
(-01 year)  
(-01 year)
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<th>INDIRECT COSTS</th>
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<td>Bonn, J.</td>
<td>Imaging of Brachytherapy Seeds in Dog Prostates</td>
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<td>Forsberg, F.</td>
<td>A Randomized Double Blind Trial Comparing the Efficacy and Safety of Enoxaparin</td>
<td>Nycomed, Inc.</td>
<td>07/01/00 - 06/30/01</td>
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<td>Aventis Pharmaceuticals</td>
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**TOTAL INDUSTRIAL FUNDING** | $532,848 | $84,267 | $617,115
**TOTAL FIRST YEAR INDUSTRIAL FUNDING** | $168,546 | $25,946 | $194,492
**TOTAL PENDING FUNDING** | $4,840,718 | $2,171,228 | $7,011,946
**TOTAL FIRST YEAR PENDING FUNDING** | $2,140,850 | $954,122 | $3,094,972

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