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Department of Radiology-Annual Report-July 1, 1982 to June 30, 1983

Jack Edeiken

Thomas Jefferson University

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I. DEPARTMENT OF RADIOLOGY

Jack Edeiken, M.D.
Professor and Chairman

II. DEPARTMENT DIVISION CHIEFS

Division of General Diagnostic Radiology

Jack Edeiken, M.D.
Professor and Chairman

Division of Ultrasound and Radiologic Imaging

Professor Barry B. Goldberg, M.D.

Division of Medical Physics

Professor Robert O. Gorson, M.S.

Division of Radiation Biology

Professor Robert L. Brent, M.D., Ph.D.

III. DEPARTMENT FACULTY

PROFESSORS

Jack Edeiken, M.D.
A. Edward O'Hara, M.D.
George T. Wohl, M.D.
Stephen A. Feig, M.D.
Carlos Gonzalez, M.D.
Robert M. Steiner, M.D.
Yen Wang, M.D., D.Sc.(Med.)
Richard E. Brennan, M.D.
Esmond M. Mapp, M.D.

Emeritus Professor

Philip J. Hodes, M.D.

Clinical Professors

David J. Ritchie, M.D.
Morton G. Murdock, M.D.

Honorary Clinical Professor

Mortimer B. Hermel, M.D.
Department Faculty (cont'd)

Research Professor

Gary S. Shaber, M.D.

Visiting Professor

Maurice Marchal, M.D.

ASSOCIATE PROFESSORS

Richard P. Cancelmo, M.D.
Chan H. Park, M.D.
David Karasick, M.D.
Stephen Karasick, M.D.
Harvey A. Koolpe, M.D.
Stanton N. Smullens, M.D.
Ronald J. Wapner, M.D.
John Wills, M.D.
Vijay Madan Rao, M.D.

Clinical Associate Professors

Irving B. Wexlar, M.D.
Hugo R. Rodriquez, M.D.
Albert Arouh, M.D.
Milton Margulies, M.D.
Joel Shapiro, M.D.
Wilfredo Mediano, M.D.
Noble L. Thompson, Jr., M.D.
Herbert C. Perlman, M.D.
Alan H. Wolson, M.D.
William J. Elwell, M.D.
Geraldine E. Hamilton, M.D.
Gustav Seliger, M.D.
Harry N. Steinmeyer, M.D.
James Ellis McGrath, M.D.
Chul Kyun Kwak, M.D.
Stephen Pripstein, M.D.
Daniel M. Scotti, M.D.
Norman J. Winston, M.D.
Richard B. Levine, M.D.
Jerome Vernick, M.D.

Honorary Clinical Associate Professors

Philip D. Gilbert, M.D.
Joseph Nussbaum, M.D.
John L. McClenahan, M.D.
Leonard S. Ellenbogen, M.D.
Visiting Clinical Associate Professor

Christopher W. Canino, M.D.

ASSISTANT PROFESSORS

Paul Walinsky, M.D.
Richard J. Wechsler, M.D.
Philip A. Katz, M.D.

Clinical Assistant Professors

Willis E. Manges, MD.
Arthur J. Press, M.D.
Donald E. Red, M.D.
Olin S. Allen, II, M.D.
Harry E. Morgan, M.D.
Joel I. Cossrow, M.D.
Wahib Bichara, M.D.
Virginia D. Bolmarcich, M.D.
Joseph T. Murphy, M.D.
Hayler H. Osborn, M.D.
David M. Danoff, M.D.
Simplicio E. Evangelista, M.D.
John Breckenridge, M.D.
Raphael Caccese, M.D.
Frederick Kramer, M.D.
Donald E. Cameron, M.D.

Visiting Clinical Assistant Professor

Gary S. Coren, M.D.

INSTRUCTORS

John H. Garafola, M.D.
Emanuel M. Renzi, M.D.
Terry A. Johnston, M.D.
Arthur S. Haber, M.D.
Gerald A. Nissenbaum, M.D.
Joseph H. Becker, M.D.
Helen Leibowitz, M.D.
David Weiss, M.D.
Bruce Stratt, M.D.
Michael Fischer, M.D.
Donald Myers, M.D.
Matilde Nino-Murcia, M.D.
Cynthia Lee Miller, M.D.
Remy Rodriguez, M.D.
Lawrence W. Wald, M.D.
Clinical Instructors

Yen-Zen Kuo, M.D.
Anthony M. Renzi, M.D.
Lillian H. Stern, M.D.
Mark Cooper, M.D.

DIVISION OF ULTRASOUND AND RADIOLOGIC IMAGING

PROFESSORS

Barry B. Goldberg, M.D.
Catherine Cole-Beuglet, M.D.
Alfred B. Kurtz, M.D.

Adjunct Professors

Dov Jaron, Ph.D.
Vernon L. Newhouse, Ph.D.
Joseph L. Rose, Ph.D.

ASSOCIATE PROFESSORS

Matthew Rifkin, M.D.
Ronald J. Wapner, M.D.

Clinical Associate Professor

Gordon S. Perlmutter, M.D.

ASSISTANT PROFESSORS

Carl S. Rubin, M.D.
Matthew E. Pasto, M.D.

Adjunct Assistant Professors

Paul A. Dubbins, M.S.S.B., F.R.C.R.
Peder C. Pedersen, Ph.D.

INSTRUCTOR

Oksana Baltarowich, M.D.
Division of Medical Physics

Professors

Robert O. Gorson, M.S.
N. Suntharalingam, Ph.D.
Benjamin M. Galkin, M.S.

Associate Professors

Dorothy Driscoll, M.S. (Permanent Disability)
Micha Hohenberger, Ph.D.
Kenneth A. Strubler, M.S.
Martin H. Schneiderman, Ph.D.
Margit Lassen, Ph.D.

Assistant Professor

Gerald J. Kutcher, Ph.D.

Instructor

Irvin Weinberg, B.S. (Biomedical Engineering)

Division of Radiation Biology

Professors

Robert L. Brent, M.D., Ph.D.
Thomas R. Koszalka, Ph.D.
Ronald P. Jensh, Ph.D.
STATEMENT OF THE DEPARTMENT

This is my twelfth annual report. The past year has been difficult and disappointing, but some of our operational goals have reached at least the final planning stages. I will address each of the goals as they were listed in my Summary in last year's report:

- Acquisition of Digital Radiography and Nuclear Magnetic Resonance equipment—a major goal;

- Completion of the relocation of the Division of Ultrasound and Radiologic Imaging;

- Space planning for CT scanners and NMR equipment;

- Further improvement in the management of the Film Library;

- Implementation of Patient and Film Tracking;

- Implementation of Electronic Signature;

- Improvement in Turnaround Time of x-ray reports;

- Consideration of a separate section in the Film Library for controlling the dispensing of films to referring physicians;

- Continue to keep abreast of new imaging modalities;

- Improve outpatient "waiting time";

- Maintain the general excellence of our teaching program;

- Continue to seek research funding.

Acquisition of Digital Radiography and Nuclear Magnetic Resonance equipment was a major goal. Although we have obtained Approval for both units, renovation of the space which will house the equipment must wait until the middle or end of this fiscal year. I am pleased that we have made these strides, and yet, I hope that we will get this equipment in the very near future so that research may go on.

Relocation of the Division of Ultrasound and Radiologic Imaging also depended on space planning, which is almost finalized. We hope to be in the new location by the end of this fiscal year.

Space Planning for CT Scanners and NMR Equipment progressed at about the same rate as mentioned in the previous two paragraphs. A suggestion to locate the equipment in the Thompson Building is probably the best solution, even though it will cause patient and physician inconvenience. But, to place the equipment elsewhere would entail delays of probably two or three years.
Further Improvement in the Management of the Film Library, Implementation of Patient and Film Tracking, and Implementation of Electronic Signature are inter-related goals. Film Library services have improved, but total computerization of Patient and Film Tracking has been delayed. A major obstacle in achieving this goal was the refusal by the Hospital to approve the purchase of computer hardware. The denial of our request for $100,000 was discussed at one of our Departmental Staff Meetings. In an overwhelmingly generous motion, the Radiology Staff approved the purchase of the needed equipment; the funds for this equipment to come from their own Physician’s Fund. Plans now are to acquire the new equipment early in the coming fiscal year.

Improvement of Turnaround Time of X-ray Reports has been disappointing. Even though turnaround time is not entirely satisfactory, I believe there is little else we can do. By January 1984, we expect to have acquired Electronic Signature and I am certain that turnaround time will then improve perceptively.

A separate Section in the Film Library for Controlling the Dispensing of Films to Referring Physicians has been established but has been working only fairly well. Funding for necessary personnel to handle this new position has been refused by Hospital Administration; therefore, improvement has not been what we had expected.

It has been most difficult to Continue to Keep Abreast of New Imaging Modalities primarily because of the large amount of capital needed to acquire this equipment. We are speaking to various X-ray companies and have made some deals with them which allow us free equipment or free use of equipment for an extended period of time. We hope we can maintain our leadership in these areas.

Improve Outpatient “Waiting Time”: Apparently, there has been some improvement over the previous years, although in-depth flow studies have not been conducted. Patient questionnaires, which were filled-out anonymously by patients before leaving the X-ray Department, indicate satisfaction with the service received in Radiology.

Maintain the General Excellence of our Teaching Programs: This most certainly continues at its very high level. All of our graduating residents passed both Part I and Part II of the American Board of Radiology examinations, which is the most important standard for evaluating a program.

Continue to seek Research Funding: Again, we have spoken to X-ray companies and also have been using Jefferson Associates in Radiology (JAR) funds in an attempt to "seed" research. I do not have to explain to the Dean the difficulty in obtaining funding from government sources. Currently, there are 22 ongoing research projects, though some are not funded (see RESEARCH PROGRAMS, page 17).

Concluding the discussion on last year's goals, I would like to turn to other problems which have caused difficulties during this past year.

One problem we faced had to do with the need to increase staff positions. Studies in areas which include CT (body and head), Neuroradiology, and Angiography had tremendous growth in the past year, placing an impossible burden on the existing staff. To alleviate this burden, we requested the addition of two more physicians to the staff; one in Special Studies, the other in Neuroradiology. Hospital Administration saw fit to allow the added slot in
Special Studies, but the Neuroradiology slot was rejected. Due to the heavy caseload and the significant number of Night Calls, it was imperative to place another person in this area. Unfortunately, these funds, too, are being taken out of JAR.

Another situation we face from time to time is the lure of private practice. On July 1, 1982, Dr. Richard Brennan left Jefferson for private practice. This outstanding individual was in-charge of the CT area. He was offered three times the salary he received here at Jefferson. Certainly, no one could blame him for leaving, but his departure was a great loss to the Jefferson community. RICHARD WECHSLER, M.D. was assigned as Physician Director of the CT area, replacing Dr. Brennan. Dr. Wechsler has been doing an outstanding job coordinating the flow of CT scans, special angiographic studies and neuroradiology.

The Digital Radiography Unit is not in place yet, but we hope to have it in the near future. However, this is merely the beginning. The future will bring a switch from the standard type of x-ray film to digital radiography throughout the department. This will require capital funds probably in the neighborhood of $3-$5 million in a period of ten years. I believe that the entire operational flow will change considerably. Some advantages are: 1) a significant decrease in the dosage received by the patients, and 2) the ability to file data--and considerably more data--in a smaller area.

During the past year, a great deal of pressure was put on Jefferson Associates in Radiology (JAR) to switch the billing system from an outside concern to Professional Accounts Management (PAM). I found myself in a very uncomfortable position: I wanted to support the institution; yet, I have a fiduciary responsibility to the rest of my staff and I felt that there was a conflict of interest in this area. The reason for such thinking is that the Board of Directors of PAM is made up of a number of administrative personnel from the Hospital. There are times when negotiations are adversarial in nature, and I felt that the best interests of JAR could not be met by joining this billing system. I was never informed that this corporation was being formed and I had absolutely no input to it. My biggest concern was that when things might not be going right, I would have no leverage for response if I could be forced into this billing situation. For these reasons, I turned the Administration down. Again, I feel somewhat uncomfortable with the decision, but I also feel that my responsibilities have been met.

To sum up these problems, I think it is probably fair to say that, on one hand, demands are made upon the department to provide state-of-the-art equipment, thereby efficiently providing the best service to our patients; but on the other hand, funds are not available for either the purchase and acquisition of the equipment and the space renovations necessary, or for the increased needs in personnel that computerization and digitalization of the department, and increased demands for more sophisticated studies require. It becomes necessary to impose great personal sacrifice on members of my department.

I am genuinely proud of the faculty in the Department of Radiology. Besides their dedication and generosity, members of the department have participated in Federal Government Hearings and on City Government Committees, establishing guidelines or identifying areas which need research in the interest of enhancing the health of our nation and our city. Those activities are over and above their
daily responsibilities in the Jefferson community and speak highly of the characters of these men. (See OTHER IMPORTANT ITEMS, page 60).

Global recognition of Jefferson's Department of Radiology is evidenced by the increased number of invitations to present lectures, participate in refresher courses, and conduct CME courses world-wide. A glance at the SCIENTIFIC PRESENTATIONS section of this report (page 34) will show that members in General Diagnostic Radiology, Ultrasound, and Radiation Biology divisions have conducted courses or presented their work in Denmark, England, France, Japan, Mexico, South Africa and Taiwan, thereby placing Jefferson in the forefront as a leader in medicine.

The Department of Radiology is recognized at home as well as abroad. Our teaching programs remain constant, maintaining an enviable excellence. Stephen A. Feig, M.D. is our director of medical education overseeing the Fourth Year Medical Student elective in radiology (RAD 401-01). Also under his direction is the Radiology Residency Program, assisted by Co-directors David Karasick, M.D. and Stephen Karasick, M.D. Medical students rotating through our department express a thorough enjoyment of this phase of their learning experience, while residents who successfully interview for residency slots demonstrate a sincere pride in their acceptance for these envied positions. Students and residents alike are asked to complete evaluations of their experiences in the department, the conferences which they attend, the teaching methods used by our faculty, and are also asked for their personal comments and suggestions. These evaluations are most valuable; they point out areas of weakness as well as areas of strength. I am happy to say that the responses are nearly always positive.

Our Fellowship programs are under the supervision of division and section Chiefs: namely, Division of Diagnostic Ultrasound and Radiologic Imaging, Barry B. Goldberg, M.D.; Neuroradiology Section, Carlos Gonzalez, M.D.; Special Procedures Section, Harvey A. Koolpe, M.D.

The Divisions of Medical Physics and Radiation Biology teaching programs are under the auspices of Professors Robert O. Gorson and Robert L. Brent, respectively, and are ably assisted by Margit Lassen, Ph.D. and Thomas Koszalka, Ph.D.

Richard B. Levine, M.D. came to Jefferson in late 1981, maintaining his association with Warminster General Hospital as Clinical Liaison Teaching Associate and, also, Clinical Consultant to their Radiology Department. He has contributed his remarkable administrative talent to the Jefferson Associates in Radiology by actively participating in revenue and benefits matters. Further, he has been assigned as Coordinator of Jefferson's Tuesday City-wide Radiology Conference. 
SUMMARY

The entire staff has been doing an outstanding service. They have been cooperative and have produced considerable clinical and some basic research; their teaching has been exemplary; and cooperation in patient service has been far beyond my greatest expectations. It is not possible to mention each faculty member individually, calling attention to his or her contributions or achievements. I hope it is enough to say that I am deeply grateful to my staff for their continued support and cooperation in the good times as well as the bad. I am sure the year ahead will be equally challenging as we anticipate changes, moves, acquisition of new equipment, and increasing demands for patient service.

With confidence based on the competence and skills of my staff, and with optimism based on past experiences, I state the goals of the Department of Radiology for July 1, 1983 through June 30, 1984:

- to implement Electronic Signature;
- to implement Film Tracking and Patient Flow;
- to implement the new Ultrasound Division as well as the Special Studies Section, which will include Neuroradiology, CT and NMR;
- to improve the Turnaround Time for Reports;
- to improve the Film Library operations, aided by the purchase of the new computer hardware and the ability to store many more reports;
- to continue to seek outside funds for clinical and basic research;
- to maintain the high quality of education;
- to try to increase revenues into the department so that funding will be easier for "seeding" research projects and purchasing necessary computer hardware, which is impossible to supply by the capital budget.

Jack Edeiken, M.D.
Professor and Chairman
A. Teaching Programs for Medical Students

(1) Division of Diagnostic Radiology

Sophomore Medical Students: Under the direction of Professor A. Edward O'Hara, our residents demonstrate the correlation between gross and roentgen pathology for the second-year students in the Pathology Block. This was carried out by case presentation and close association with the Pathology staff.

Senior Medical Students Elective RAD 401-01: This elective is under the direction of Professor Stephen A. Feig. Each day there is a one-hour conference where medical students only are called on to describe the radiographic findings and to go through a differential diagnosis. Over the month-long elective, we are able to touch briefly on each area of general diagnostic radiology. Students prepare for these scheduled conference topics by assignments and text material, audiovisual cassettes, and teaching file. Conferences are kept informal, yet stimulating. The conference material comes from the medical student teaching file which now contains over 500 cases. In addition, the students may attend any of the three hours of Resident Teaching Conferences held each day. Because the department is comprised of many decentralized areas (film reading, patient examination, and consultation areas), we can accommodate as many as 20 elective students while still allowing individualized instruction. At any given time, small groups of students are assigned to different areas, such as the Ballroom (inpatient film reading), Core II (intravenous pyelography), Core III (fluoroscopy and GI radiography), Radiology Library, Pediatric Radiology reading room, Neuroradiology, Angiography, Computerized Axial Tomography, and Radioisotopes.

The students observe film reading and participate in the discussions with staff and residents as the films are interpreted throughout the day. They also observe a representation of each type of special procedure performed in the department, such as upper GI series, barium enema, hysterosalphingography, myelography, arthrography, bronchography, venography, cerebral arteriography, peripheral venography, abdominal arteriography, computerized axial tomography, nuclear scans of the brain, chest, liver and spleen, and cardiac and abdominal ultrasound.

All students are asked to complete an evaluation form of the elective and nearly all of them have rated it "Very Good" or "Excellent." Many describe it as among the best and most enjoyable learning experiences of their senior year.

The senior radiology elective was taken by approximately 180 members of the senior class of Jefferson Medical College. Of these, 150 completed the RAD 401-01 elective at Thomas Jefferson University Hospital; the remaining 30 at affiliated hospitals and outside institutions. In addition, the RAD 401-01 elective was completed by 20 students from other medical schools and 15 House Staff officers from the Departments of Medicine and Family Practice.
Division of Ultrasound and Radiologic Imaging Teaching Program

Dr. Oksana Baltarowich conducted formal courses for the students on the RAD 401-01 elective where they were exposed to the latest uses of diagnostic ultrasound. These courses are specifically designed for medical students in order to prepare them for clinical uses of ultrasound, and includes lectures, case reviews, and examinations on the material presented. The students are also able to participate in the ongoing conferences as well as ultrasound video and slide film review sessions. Opportunities exist to view examinations being performed by highly skilled technologists and interpretations of the examinations by trained physicians.

Division of Medical Physics

Because of recent changes in the medical school curriculum, this was the first year that no formal lectures were given to the medical students. However, Mr. Weinberg continued to provide practical instruction on the CT scanners to radiology technicians, and Professors Corson and Galkin presented several lectures to the student x-ray technicians in the School of Allied Health Sciences.

Division of Radiation Biology

Professor Thomas R. Koszalka conducted lectures in Freshman Medical Biochemistry and Biochemistry 401, as well as Phase III Teaching for senior medical students.

B. Teaching Programs for Graduate Students

Division of Ultrasound and Radiologic Imaging

The teaching program for graduate students includes formal courses planned throughout the year in which physicians from all over the country and the world are able to attend lectures and clinical programs in which intensive teaching is provided in all areas of ultrasound, including the abdomen, obstetrics, gynecology, echocardiography, real-time, doppler, and the numerous other areas in which ultrasound is able to provide clinical information. Included in the program is exposure to cross-sectional anatomy, physics and instrumentation.

Divisions of Medical Physics and Radiation Biology

The course on radiation physics and radiation biology offered occasionally to graduate students in the College of Graduate Studies was not given this year.

C. and D. Training Programs for Fellows and Residents

Division of Diagnostic Radiology Fellowship Programs

The Division of Diagnostic Radiology offers two one-year Fellowship programs: one in Neuroradiology, under the direction of Carlos Gonzalez, M.D.; the other in Special Procedures (Angiography) under the direction of Harvey Koolpe, M.D. Great emphasis is placed on learning these highly-sophisticated procedures,
in addition to the vast amount of experience gained in performing both diagnostic and therapeutic vascular studies and neurologic studies including CT of the head and the spine. Also included in these Fellowships is exposure to teaching and research. During this past year, the Fellows have worked with the staff in writing papers which have been submitted for publication.

(2) Division of Ultrasound and Radiologic Imaging Fellowship Program

The Fellowship Program in Ultrasound and Radiologic Imaging provides a full year of training, including didactic lectures and practical experience in all areas of ultrasound to graduates from a radiology residency program. These Fellows have extensive exposure not only to clinical care but also to teaching and research. They work on research projects with the staff during the year and this past year they worked with the staff in writing papers, several of which have been submitted for publication. The five individuals who graduated from this program in June 1983 are capable of establishing and running a division of diagnostic ultrasound.

The reputation of the training facilities in the Division of Ultrasound and Radiologic Imaging makes it a sought-after program. Lecturers are invited from all over the world and, through our videotape capabilities, their lectures are recorded for inhouse use. This provides expanded training opportunities for our medical students, residents, technologists, and staff. Our courses have been completely filled over the past several years.

(3) Division of Medical Physics

Margit Lassen, Ph.D., gave several lectures on the physics of computed tomography scanners and nuclear magnetic resonance to staff, residents, and others who were interested. Some lectures also involved site planning and preparation as well as guidelines for equipment specifications.

(4) Division of Radiation Biology Training Program for Research and Clinical Fellows

The Training Program in Developmental Biology and Radiation Biology provides predoctoral candidates in the basic sciences and postdoctoral trainees in the basic sciences and clinical sciences, the opportunity to obtain research training in experimental embryology, radiation biology, teratology, developmental immunology and developmental biochemistry. The training program is conducted by a multidisciplinary research team housed in a separate facility primarily concerned with these research problems. All staff members mentioned in the training proposal are already working together on research programs, each contributing his area of expertise to the research and training programs. The predoctoral trainee will receive a complete graduate program under the auspices of the graduate school and a medical basic science department and have his research experience with one or more of the members of the developmental biology group. He shall receive broad enough training to prepare him for a position in teaching and/or research in a basic science department or function in industry or government as a specialist in these fields. Clinical trainees who obtain training in this program would be expected to staff respective medical school departments with emphasis on teaching and research in their
discipline or could also apply their training to problems in governmental medicine or industry.

<table>
<thead>
<tr>
<th>POSTDOCTORAL FELLOWS</th>
<th>SOURCE OF SUPPORT</th>
<th>DURATION OF FELLOWSHIP</th>
</tr>
</thead>
<tbody>
<tr>
<td>John Carbone</td>
<td>NIH HD 07075</td>
<td>3 years</td>
</tr>
<tr>
<td>Steven Lerman</td>
<td>NIH HD 07075</td>
<td>3 years</td>
</tr>
<tr>
<td>Mary Giknis</td>
<td>NIH HD 07075</td>
<td>3 years</td>
</tr>
</tbody>
</table>

E. Residents in Radiology

The American Board of Radiology requires four years of residency training for physicians entering the specialty directly from medical school and three years of training for physicians who have completed an internship. Our department offers both three- and four-year programs.

Number of Residents in Each Level

a) Fourth year residents - 3  
b) Third year residents - 4  
c) Second year residents - 4  
d) First year residents - 6

During this past year, the residency training program maintained its tradition of academic excellence. Several aspects of our program may be found in only a very few of the prime teaching hospitals around the country and should be noted.

First, we maintain a heavy schedule of formal teaching conferences for radiology residents; between fifteen and twenty hours per week throughout the entire academic year. Some of these are didactic type lectures and cover the accumulated knowledge from each of the subspecialty areas of radiology, such as ultrasound, mammography, GI, pediatrics, nuclear medicine, urography, bone, chest, neuroradiology, cardiovascular, angiography, and radiologic physics. Over the year, these provide a comprehensive review of the entire subspecialty. Other conferences are based on current daily case material where residents are called on to describe a radiographic finding and proceed through a differential diagnosis as they would on Part II of the Radiology Specialty Boards.

Second, no radiographs are dictated by the residents unless they have been first reviewed with the staff. Of course, this requires an extra effort but it leads to the best patient care. Also, each film serves as a teaching case and a point of discussion for residents and medical students.

Third, one or more staff radiologists are assigned at all times to each area of our department, such as the Ballroom (inpatient work), Consultation Room, GI,
IVP, Core II (outpatient film reading), CT scan, pediatric radiology, angiography, neuroradiology, ultrasound, etc. In this manner there is constant film reading, consultation, medical student and resident teaching throughout the day.

Fourth, all of our residents attend a six-week course in radiologic-pathologic correlation given by the Armed Forces Institute of Pathology in Washington, D.C. This is a very thorough and well-taught introduction to an area which is basic to radiology. Not many residency programs have access to the AFIP course, but because of the quality of our residency program and the caliber of our residents, we have always been fortunate to secure slots for each of our trainees.

Fifth, our Radiology Library, located within our department, represents one of the best such teaching resources of any department throughout the country. It includes several thousand teaching file cases written up with diagnosis, clinical and pathologic findings, several hundred hours of audiovisual cassettes, journals, and textbooks. There is a full-time Radiology Librarian. Our library also contains areas with view-boxes and audio-viewers for reviewing our teaching material.

As expected, the radiology residency at Jefferson is a much sought-after program. There are well over 100 applicants for our two first-year positions and of these, approximately one-third were invited to spend an entire day in the department, speaking to the staff and residents, and attending conferences and film reading sessions.

Our two new residents for July 1, 1983 are noted for their past achievements and future potential. Randi L. Kauffman, M.D. received her B.A. Magna Cum Laude from Lehigh University where she was awarded Phi Beta Kappa. She graduated in the top 25% of her class from the Medical College of Pennsylvania and thereafter completed an internship at Chestnut Hill Hospital. Stewart B. Greenberg, M.D. is a Cum Laude graduate of the University of Pennsylvania. He graduated in the top 10% of his class from Hahnemann Medical College.

During the current year, our residents were accorded numerous distinguished honors. In the annual Philadelphia Roentgen Ray Society Film-Reading Competition, John F. Schilling, M.D. won the First Place prize and Cynthia Miller, M.D. won the Second Place prize. Our Chief Resident, Anthony J. Limberakis, M.D. served as Secretary to the American Association of Academic Chief Residents in Radiology. Neil Kramer, M.D. was awarded an American Cancer Society Fellowship for work in clinical oncology in the Radiology Department.

Our senior residents, Kevin Byrne, M.D., Anthony J. Limberakis, M.D., and Cynthia L. Miller, M.D., all passed Parts I and II of the American Board of Radiology examinations and thereby received Diplomates in Diagnostic Radiology from the American Board of Radiology. As of July 1, 1983, Kevin Byrne, M.D. will remain in our department as a Fellow in Diagnostic Ultrasound and Computed Tomography. Anthony J. Limberakis, M.D. will stay on as a part-time attending in our department staff while beginning radiology practice in Northeast Philadelphia. Cynthia L. Miller, M.D. will become a full-time member of our attending staff. We are very proud of all these graduating senior residents,
who first came to our department five years ago from other medical schools as students who took the Radiology 401-01 elective, and because they were favorably impressed with our teaching program, decided to enter our residency program.

For the coming year, John F. Schilling, M.D. has been selected Chief Resident. John graduated Magna Cum Laude, Phi Beta Kappa from Franklin & Marshall College and received his M.D. from Jefferson Medical College of Thomas Jefferson University where he was a member of Alpha Omega Alpha.

(1) Division of Medical Physics

The Division of Medical Physics made some important changes in the RAD 521 course for radiology residents. In past years, this course had always been given on an annual basis, consisting of 140-150 lecture hours and examination periods. As it became necessary to expand the physics of diagnostic radiology to include the newer technological developments in CT scanning, digital imaging and now in nuclear magnetic resonance imaging, there developed a consensus that the course should be spread over a two-year period. Accordingly, the course was restructured so that all of the basic physics and nuclear medicine physics and radiation biology was given in the 1982-83 session. The applications of medical physics to diagnostic imaging, ultrasound, CT scanning, digital imaging, and nuclear magnetic resonance will be covered during the 1983-84 session. As in recent years, the diagnostic residents from Pennsylvania Hospital took the course along with the Jefferson residents. The instructors were: Professor Gorson, Dr. Lassen, Dr. Madsen, Professor Galkin, Mr. Weinberg, and Dr. Shabason (from Pennsylvania Hospital).

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VII. RESEARCH PROGRAMS

1. "No Dose Highly Magnified Mammograms to Aid Diagnosis"
   
   Principal Investigator: Benjamin M. Galkin, M.D.
   Co-Investigators: Stephen A. Feig, M.D.
                    Peter Frasca, Ph.D.
   
   Source of Support: NIH 1-R01-CA-18961-01 - $131,399
   
   Grant Period: 12/1/80 - 12/1/82

2. "Assessment of Ultrasonic B-scan Imaging for Detection and Quantification of Atherosclerotic Lesions in Human Carotid and Iliofemoral Arteries and in Arteries of Animals"
   
   Principal Investigator: Barry B. Goldberg, M.D.
   Co-Investigators: Alfred B. Kurtz, M.D.
                    Matthew D. Rifkin, M.D.
                    Stanton N. Smullens, M.D.
                    Carlos Gonzalez, MD.
   
   Source of Support: NIH-NOHV-12912 - $229,480
   
   Grant Period: 4/1/82 extended to October 1984

3. "Development of a Nonsubtraction Intravenous Angiography"
   
   Principal Investigator: Yen Wang, M.D., D.Sc.(Med.)
   Co-Investigators: Robert M. Steiner, M.D.
                    Esmond Mapp, M.D.
                    David Karasick, M.D.
                    Vijay M. Rao, M.D.
                    Harvey A. Koolpe, M.D.
   
   Source of Support:
   
   Grant Period:

4. "Investigation of Clinical Application of Yttrium Filter for Radiation Exposure Reduction"
   
   Principal Investigator: Yen Wang, M.D., D.Sc.(Med.)
   Co-Investigators: George McArdle, R.T.
                    Stephen Karasick, M.D.
                    Jack Edeiken, M.D.
   
   Source of Support: AGFA Geveart Co. - $6,000
   
   Grant Period: 1982-1983
5. "Comparison of Iopamidol and an Ionic Contrast Agent in Thoracic and Abdominal Computed Tomography"

Principal Investigator: Robert M. Steiner, M.D.
Co-Investigators: Vijay M. Rao, M.D.
                   Richard Brennan, M.D.
                   Richard Wechsler, M.D.
                   Esmond Mapp, M.D.
                   Yen Wang, M.D., D.Sc.(Med.)

Source of Support: Squibb Research & Development Division - $7,000

Grant Period: 3/1/82 - 9/1/82

6. "Effect of Ionic and Non-Ionic Contrast Agents on Platelet Function"

Principal Investigator: Vjay M. Rao, M.D.
Co-Investigators: A. K. Rao, M.D.
                   Robert M. Steiner, M.D.

Source of Support: Jefferson Associates in Radiology $3,000

Grant Period: 1/1/82 - 12/30/82

7. "Brain Growth in Infants Born to Drug-Dependent Women"

Principal Investigator: Loretta P. Finnegan, M.D.
Co-Investigators: Barry B. Goldberg, M.D.
                   Leonard J. Graziani, M.D.
                   Matthew E. Pasto, M.D.

Source of Support: NIH-DA-02902-03 - $167,077

Grant Period: 4/1/81 - 3/31/84

8. "Ultrasonic Endoscopic Imaging of the Coronary Arteries and Tumors Within the Mediastinum and Pelvis"

Principal Investigator: Alfred B. Kurtz, M.D.
Co-Investigators: Barry B. Goldberg, M.D.
                   Matthew D. Rifkin, M.D.

Source of Support: Whitaker Foundation - $70,481

Grant Period: 12/1/80 - 7/31/82
9. "Doppler Evaluation of Superior Mesenteric Artery Blood Flow in Normals"

Principal Investigator: Matthew E. Pasto, M.D.
Co-Investigators: J. Cisneros, M.D.
Barry B. Goldberg, M.D.

Source of Support: Non-Funded Departmental Program
Grant Period: Ongoing Clinical Research

10. "Ultrasound Evaluation of Neonatal Thyroid Gland"

Principal Investigator: Matthew E. Pasto, M.D.
Co-Investigators: Barry B. Goldberg, M.D.
G. Carpenter, M.D.

Source of Support: Non-Funded Research Program
Grant Period: Ongoing Clinical Research


Principal Investigator: Matthew E. Pasto, M.D.
Co-Investigators: Barry B. Goldberg, M.D.
G. Carpenter, M.D.

Source of Support: Non-Funded Research Program
Grant Period: Ongoing Clinical Research

12. "Endoscopic Evaluation of the Stomach, Liver and Pancreas"

Principal Investigator: Matthew D. Rifkin, M.D.
Co-Investigator: Susan J. Gordon, M.D.

Source of Support: Advanced Technology Laboratories
Grant Period: 1982-1983

13. "Intra-operative Uses of Ultrasound"

Principal Investigator: Matthew D. Rifkin, M.D.
Source of Support: Advanced Technology Laboratories
Grant Period: 1982-1983
14. "Aspiration Biopsy"
   Principal Investigator: Matthew D. Rifkin, M.D.
   Source of Support: Advanced Technology Laboratories
   Grant Period: 1982-1983

15. "Chorioplacental and Yolk Sac Function and Dysfunction"
   Principal Investigator: Robert L. Brent, M.D., Ph.D.
   Co-Investigator: Thomas R. Koszalka, Ph.D.
   Source of Support: NIH-HD-13411 - $86,035
   Grant Period: 11/1/81 - 11/30/82

16. "Problems in Radiation Embryology"
   Principal Investigator: Robert L. Brent, M.D., Ph.D.
   Co-Investigator: Ronald P. Jensh, Ph.D.
   Source of Support: NIH-CA-29628-06 - $90,033
   Grant Period: 9/1/82 - 8/31/83

17. "Developmental Biology Training Program"
   Program Director: Robert L. Brent, M.D., Ph.D.
   Co-Program Director: Ronald P. Jensh, Ph.D.
   Source of Support: NIH-HD-07075-07 - Grant extended without additional funds.
   Grant Period: 7/1/82 - 6/30/83

18. "Short-Term Training: Students in Professional Schools"
   Program Director: Robert L. Brent, M.D., Ph.D.
   Co-Program Director: Allan J. Erslev, M.D.
   Source of Support: NIH-HL-07497 - 33,900
   Grant Period: 5/1/83 - 4/30/84
19. "Proposed Study of Achondroplasia"

  Principal Investigator: Robert L. Brent, M.D., Ph.D.
  Co-Investigators: Thomas R. Koszalka, Ph.D.
                    David Bechman, M.D.
  Source of Support: Foerderer Foundation - $50,000
  Grant Period: 1/1/83 - 12/1/83

20. "Effects of X-irradiation on Postnatal Development"

  Principal Investigator: Ronald P. Jensh, Ph.D.
  Source of Support: NIH-HD-14840 - $302,018
  Grant Period: 12/1/80 - 11/30/83

21. "Problems in Radiation Embryology"

  Principal Investigator: Ronald P. Jensh, Ph.D.
  Source of Support: NIH-CA-29628 - $278,117
  Grant Period: 9/15/80 - 9/31/83

20. "Doctoral Program in Toxicology"

  Principal Investigator: Ronald P. Jensh, Ph.D.
  Grant Period: 5 years

21. "Residual After-Effects of Chronic Amphetamine Infusion"

  Principal Investigator: Ronald P. Jensh, Ph.D.
  Grant Period: 7/1/82 - 6/30/83
Principal Investigator: Thomas R. Koszalka, Ph.D.
Co-Investigators: Robert L. Brent, M.D., Ph.D.
K. Sheth
Source of Support: NIH - $80,972
Grant Period: 9/1/81 - 8/31/82


DIVISION OF ULTRASOUND AND RADIOLOGIC IMAGING


DIVISION OF MEDICAL PHYSICS


DIVISION OF RADIATION BIOLOGY


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A. Lectureships

JACK EDEIKEN, M.D.

August 17-19, 1982
M. D. Anderson Hospital and Tumor Institute
Houston, Texas
- "Ankle Trauma"
- "Approach to Bone Tumors"

August 29-September 5, 1982
Ninth Annual Meeting and Refresher Course of
The International Skeletal Society, San
Francisco, California
- Moderator: Refresher Course - Spine Session

September 13-16, 1982
University of Minnesota, Minneapolis
Radiology/82: Skeletal Radiology (CME Course)
- Session IV: "Radiologic Approach to
Arthritis"
- Panel Discussion - Interesting Cases
- FOURTH MALCOM B. HANSON MEMORIAL LECTURER
"Benign Bone Disease Simulating
Malignancy"

October 2, 1982
William Beaumont Hospital, Royal Oak, Michigan
- "Ankle and Foot Injuries"
- "Approach to Bone Tumors"
- "Approach to Arthritis"

October 13-14, 1982
Eastern Virginia Graduate School of Medicine
Norfolk, Virginia
- "Approach to Radiologic Diagnosis of
Arthritis"
- "Approach to the Radiologic Diagnosis of
Bone Lesions" - Grand Rounds

October 21, 1983
Radiological Society of New Jersey and
St. Barnabas Medical Center
Livingstone NJ
- "A Radiologic Approach to Bone Lesions"
November 4-5, 1982
State University of New York-Upstate Medical Center, Syracuse, New York
- "Radiologic Approach to Arthritis"
- "Trauma to the Ankle and Foot"

November 27-December 3, 1982
68th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, Illinois
- "Trauma to the Ankle and Foot"

February 8, 1983
Indiana University Medical Center
Indianapolis, Indiana
- "Ankle Trauma"
- "Radiologic Approach to the Diagnosis of Arthritis"

February 28-March 3, 1983
American College of Radiology - Best of the Seminars - Innisbrook, Florida
- "Arthritides and Allied Disorders"
- "Trauma"

March 25-27, 1983
Texas Radiological Society, Corpus Christi
- "Radiologic Approach to Bone Lesions"
- "Ankle Trauma"
- "The Radiologic Approach to Arthritis"

April 19, 1983
83rd Annual Meeting of the American Roentgen Ray Society, Atlanta, Georgia
- "Injuries of the Ankle"

April 21, 1983
Michigan State University
Lansing, Michigan
- "Hyperparathyroidism"

May 5-7, 1983
New Orleans Radiologic Society Annual Spring Conference, New Orleans, Louisiana
- "Radiologic Approach to Arthritis"
- "Radiologic Approach to Bone Lesions"
- "Ankle Trauma"
- "Radiologic Approach to Wrist Dislocations"
Third Annual Conference: The Leading Edge in Diagnostic Ultrasound - Atlantic City, NJ
Sponsored by the Division of Ultrasound and Radiologic Imaging, Department of Radiology, Thomas Jefferson University.

- Opening Remarks

STEVEN A. FEIG, M.D.

August 26-28, 1982 International Copenhagen Symposium on Detection of Breast Cancer, Copenhagen, Denmark

- "Hypothetical Breast Cancer Risk from Mammography"
- "Benefits and Risks of Mammography"
- "Clinically Occult (Non-palpable) Breast Lesions: Technique of Localization and Excision"
- "Prognostic Pathological Factors among Breast Cancers Detected on Screening by Mammography"

November 10, 1982 Interdepartmental Clinical Conference, Chestnut Hill Hospital, Chestnut Hill, PA

- "Mammography in Clinical Practice"

April 17-20, 1983 Applications of Optical Instrumentation in Medicine XI, SPIE - The International Society for Optical Engineering, Atlanta, Georgia

- "Benefit/Risk of Mammographic Screening"

May 21-22, 1983 Annual Meeting of the Society for the Study of Breast Disease, Boston, Massachusetts

- "Proper and Improper Methods for Evaluation of New Imaging Procedures for Breast Disease"
- "Avoidable Errors in Mammographic Interpretation"
HARVEY A. KOOLPE, M.D.

August 4, 1982  Latrobe Area Hospital, Latrobe, PA
Medical Surgical Conference and Grand Rounds
- "Transluminal Angioplasty"
- "Pulmonary Embolism"

May 4, 1983  Johns Hopkins University Hospital
Baltimore, Maryland
- "Transluminal Biopsy Techniques in the
  Management of Malignant Obstructive
  Jaundice"

ESMOND MAPP, M.D.

July 26, 1983  National Medical Association Convention
San Francisco, California
- Moderator: Joint Urology Radiology Session
- "Examination of the Stomach: Whither and
  Wherefore"

March 3, 1983  Philadelphia Roentgen Ray Society
Philadelphia PA
- Panel Moderator: Finkelstein Oration
  meeting.

A. EDWARD O'HARA, M.D.

February 24, 1983  U. S. Naval Hospital, Bethesda, Maryland
- "Normal Variations of the Infant Chest"
- "Pitfalls in Pediatric Chest Radiology"
- Potpourri Film Reading Session

May 6, 1983  Fitzgerald-Mercy Hospital, Darby, PA
- "Pertinent Pulmonary Patterns in Premature
  Infants"
VIJAY MADAN RAO, M.D.

November 30, 1982
68th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, Illinois
- "Inhibition of Platelet Function by Radiopaque Contrast Media" - Work in Progress Session.

March 7, 1983
Iopamidol World-Wide Symposium
Fort Lauderdale, Florida
- "Effect of Radiologic Contrast Media on Platelet Function"

March 23, 1983
Association of University Radiologists 31st Annual Meeting, Mobile, Alabama
- "Inhibition of Platelet Function by Radiologic Contrast Media"

ROBERT M. STEINER, M.D.

August 1982
University of Delaware
- "Radiology of the Heart, Lungs and Gastrointestinal Tract"

November 1982
68th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, Illinois
- "Chest CT: Normal Variants Simulating Intrathoracic Disease"
- "Misplaced Venous Catheter: Detailed Anatomic Considerations"

January 19-21, 1983
Veterans Administration Hospital and the Maricopa County Medical Society, Phoenix AZ
- "The Radiology of Adult Congenital Heart Disease"
- "CT of the Chest: Indications and Advantages"
- "CT of the Cardiovascular System"
Robert M. Steiner, M.D. (cont'd)

March 18, 1983  
Eighth Congress of the Dominican Medical Society, Santo Domingo, Dominican Republic  
- "CT of the Chest"  
- "Aspiration Needle Biopsy of the Lung"

March 1983  
American College of Radiology, New Orleans  
- "Misplaced Thoracic Venous Catheters: Detailed Anatomic Considerations"

April 1983  
American Roentgen Ray Society, Atlanta, GA  
- "Misplaced Thoracic Venous Catheters: Detailed Anatomic Considerations"

YEN WANG, M.D., D.Sc. (Med.)

November 28-December 3, 1982  
68th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, Illinois  
- "Some Specific Differences in Radiologic Interpretation between Experts and Residents"

December 21, 1982  
Tokyo University, Tokyo, Japan  
- "Future of Digital Radiography"

December 28, 1982  
Taiwan University Medical School, Taiwan  
- "Future of Digital Radiography"

March 23, 1983  
31st Annual Meeting of the Association of University Radiologists, Mobile, Alabama  
- "Comparison of Al, Y, Cu and Fe Filters for Radiation Exposure Reduction in Radiographic Examinations"  
- "Optimal Yttrium Filter for Marked Radiation Exposure Reduction in Radiographic Examination"

April 22, 1983  
83rd Annual Meeting of the American Roentgen Ray Society, Atlanta, Georgia  
- "Applications of Yttrium Filter in Radiographic Examinations"
RICHARD WECHSLER, M.D.

December 3, 1982
68th Scientific Meeting of the Radiological Society of North America, Chicago, Illinois
- "The Aberrant Thoracic Venous Catheter" Presented by Co-author: Kevin Byrne, M.D., Resident in Radiology, TJUH

January 6, 1983
Philadelphia Roentgen Ray Society, Philadelphia PA
- Invited Film Panelist

April 23, 1983
Seventh Annual Computerized Radiology Society Seminar, Washington, D.C.
- "CT of the Psoas Muscle"

May 12, 1983
Third Annual Conference: The Leading Edge in Diagnostic Ultrasound - Atlantic City, NJ
Sponsored by the Division of Ultrasound and Radiologic Imaging, Department of Radiology, Thomas Jefferson University
- Meet the Professors - "Tutorials in Differential Diagnosis" - Sessions I-a and II-a: Abdomen - Pasto, M.E. and Wechsler, R.J.

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OKSANA BALTAROWICH, M.D.

May 11-14, 1983
Third Annual Conference: The Leading Edge in Diagnostic Ultrasound - Atlantic City, NJ - Sponsored by the Division of Ultrasound and Radiologic Imaging, Department of Radiology, Thomas Jefferson University
- Meet the Professors - "Tutorials in Differential Diagnosis" - Sessions I-a and II-a: Gynecology - Kurtz, A. and Baltarowich, O.
- "Case Presentation and Self-Evaluation Examination"
- "Gynecologic Problem Solving"
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| July 21-22, 1982      | First International Congress on Ultrasound of the Neck, Paris, France |                                            | - "Primary Hyperthyroidism"
|                       |                                                                       |                                            | - "Ultrasound of the Pharynx and Esophagus"                            |
| October 8, 1982       | Association for the Advancement of Medical Instrumentation Annual Meeting, Philadelphia, PA |                                            | - "Abdominal Ultrasound"
|                       |                                                                       |                                            | - "Small Parts Scanning"                                               |
| November 18, 1982     | Greater Delaware Valley Ultrasound Society, Philadelphia PA            |                                            | - "Recent Advances in Breast Ultrasound"                               |
| February 19-21, 1983  | Puerto Rico Ultrasound Up-Date 1983, San Juan, Puerto Rico            |                                            | - "Real-Time Aspiration Biopsy Techniques"
|                       |                                                                       |                                            | - "Hepatobiliary and Pancreas Up-Date"
|                       |                                                                       |                                            | - "High Risk Pregnancy"
|                       |                                                                       |                                            | - "Abdominal Fluid Collections"
|                       |                                                                       |                                            | - "The Retroperitoneum"                                               |
| February 28-March 1, 1983 | Advanced Ultrasound Seminar – Harvard University, Boston, Massachusetts |                                            | - "Ultrasound of the Pancreas with CT Correlation"
|                       |                                                                       |                                            | - "Advances in Breast Ultrasound"                                      |
| April 18-22, 1983     | 83rd Annual Meeting of the American Roentgen Ray Society, Atlanta, Georgia |                                            | - "Clinical Applications of Diagnostic Ultrasound"                     |
| May 11, 1983          | Current Aspects of Diagnostic Oncology, University of Pennsylvania, Philadelphia PA |                                            | - "Sonography in Breast Carcinoma"                                    |
Catherine Cole-Beuglet, M.D. (cont'd)

May 12-14, 1983
Third Annual Conference: The Leading Edge in Diagnostic Ultrasound - Atlantic City, NJ - Sponsored by the Division of Ultrasound and Radiologic Imaging, Department of Radiology, Thomas Jefferson University

- Meet the Professors - "Techniques and Approaches" - Session I-b and II-b: Small Parts Scanning: Technique and Differential - Cole-Beuglet, C. and Foy, P.
- "Update on Ultrasound Mammography"

June 10-12, 1983
Third International Congress on the Ultrasonic Examination of the Breast, Tokyo, Japan

- "Solid Breast Masses: Can We Differentiate Benign from Malignant Tumors?"

BARRY B. GOLDBERG, M.D.

July 15, 1982
Hopital Edouard Herriot, Lyon, France

- "Trends in Medical Ultrasound"

July 24, 1982
First International Symposium on Ultrasound and Cancer, Brussels, Belgium

- "Ultrasound for the Diagnosis of Retropitoneal Cancer"

July 26-30, 1982
Third Meeting of the World Federation for Ultrasound in Medicine and Biology, Brighton, England

- "Advances in Real-Time Aspiration Biopsy Techniques"
- "Doppler/Real-Time Evaluation of Abdominal Abnormalities"

September 21, 1982
Greater Delaware Valley Ultrasound Society, Philadelphia PA

- "Factors That Will Influence the Future of Ultrasound - Equipment, Bio-Effects, Legal and Financial"

October 4-8, 1982
AIUM/SDMS Annual Convention, Denver, Colorado

- Meet the Professors - "Education for Sonologists"
Barry B. Goldberg, M.D. (cont'd)

November 27-December 3, 1982
68th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, Illinois
- "Obstetrical and Gynecological Ultrasound (Static and Real-Time Imaging)"

February 23, 1983
Nassau County Medical Center, East Meadow, NY
- "Ultrasoniographic Evaluation of the Upper Abdomen: Can Ultrasound Help?"

February 27-March 2, 1983
Advanced Ultrasound Seminar - Harvard Medical School, Boston, Massachusetts
- "Ultrasound of the Liver"
- "Setting Up an Ultrasound Facility"
- "Ultrasound of the Spleen, Adrenal and Retroperitoneum"
- "Ultrasound Contrast Agents"

March 21-23, 1983
The South African Medical Ultrasound Society, Sun City, South Africa
- "The Ultrasound of Renal and Retroperitoneal Masses"
- "Ultrasound of the Hepatobiliary System"
- "Real-Time Aspiration Biopsy Approaches"

May 11-14, 1983
Third Annual Conference: The Leading Edge in Diagnostic Ultrasound - Atlantic City, NJ - Sponsored by the Division of Ultrasound and Radiologic Imaging, Department of Radiology, Thomas Jefferson University
- "State-of-the-Art in Ultrasonic Measurements"
- Meet the Professors - "Tutorials in Differential Diagnosis" - Sessions I-a and II-a: Renal-Retroperitoneal - Darby, J. and Goldberg, B.
- "Governmental, Legal and Biological Effects on the Future of Ultrasound"
- "A Look into the Future"

June 10-12, 1983
Third International Congress on the Ultrasound Examination of the Breast, Tokyo, Japan
- "Sonomammography: An Overview"
ALFRED B. KURTZ, M.D.

September 15, 1982
Northwestern University Hospital, Chicago, Illinois
- "Analysis of the Fetus - Normal and Abnormal Anatomy"
- "CT and Ultrasound Case Presentation"

September 17, 1982
Third Annual St. Louis University Ultrasound Symposium, St. Louis University Medical Center, St. Louis, Missouri
- "Real-Time Ultrasound and Fetal Anomalies"
- "Breast Ultrasound - History, Techniques and Normal Patterns"
- "Breast Ultrasound - Mass Evaluation"

October 4-8, 1982
AIUM/SDMS Annual Convention, Denver, Colorado
- "Future Developments and Problems in Breast Ultrasound" - Panelist in Fireside Chats
- "Ultrasound Diagnosis of Fetal Skeletal Dysplasias in the Second Trimester: Prospective Analysis in a High Risk Population"
- "Differential Echo Patterns of Abdominal Organs"

October 19, 1982
Greater Delaware Valley Ultrasound Society, Philadelphia PA
- "Ultrasound of the Pancreas: Analysis and Comparison with CT"

October 25, 1982
Ultrasound Update, Advanced Concepts and New Modalities, University of Wisconsin, Madison, Wisconsin
- "Sonographic Approach for Detection of Fetal Thoracic and Abdominal Anomalies"
- "Examination Techniques of the Fetal Chest and Abdomen" (Workshop).

December 6, 1982
Lankenau Hospital, Department of Obstetrics and Gynecology, Philadelphia PA
- "Intrauterine Fetal Growth Retardation and Ultrasound"
Alfred B. Kurtz, M.D. (cont'd)

March 17, 1983  Philadelphia Roentgen Ray Society - Blue Ribbon Lecture Series, Philadelphia, PA
- "Ante-Natal Diagnosis of Congenital Anomalies"

April 9-10, 1983  Seventh Annual Clinical Applications of Ultrasound in Medicine Post- Graduate Course, Cleveland Ohio
- "Endoscopic Ultrasound Evaluation"
- "Doppler Evaluation of the Abdomen"
- "Fetal Measurements"
- "Intrauterine Growth Retardation - Difficulty in Analysis"
- "Ultrasound of Breast Masses - Update"
- "Ultrasound of Breast - Overview"

April 22-23, 1983  Seventh Annual Spring Weekend Symposium in Diagnostic Ultrasound, Downstate Medical Center, Department of Radiology, Brooklyn, NY
- "Tissue Echogenicity"
- "Sonomammography"
- "Sonographic Differentiation of Abdominal Fluid Collections"

May 4, 1983  College Night - College of Surgeons Panel, Children's Hospital of Philadelphia, Philadelphia, PA
- "Fetal Surgery: Are We Ready?"

May 11-14, 1983  Third Annual Conference: The Leading Edge in Diagnostic Ultrasound - Atlantic City, NJ - Sponsored by the Division of Ultrasound and Radiologic Imaging, Department of Radiology, Thomas Jefferson University
- "Echogenicity in Abdominal Diagnoses"
- Meet the Professors - "Tutorials in Differential Diagnosis" - Sessions I-a and II-a: Gynecology - Kurtz, A. and Baltarowich, O.
- "Rationale for In-Utero Invasive Procedures"
- "Ultrasound Assessment of the Ovarian Follicle"
October 4-8, 1982  American Institute of Ultrasound in Medicine, Denver, Colorado

- "Ultrasound in Evaluation of the Greenfield Filter: Methods and Results Using Real-Time Pulsed Doppler Equipment"

November 23-25, 1982  Advances and State-of-the-Art of Diagnostic Ultrasound, Mexico City, Mexico

- "Ultrasound of the Gastrointestinal Tract"
- "Pulsed Doppler, Use in the Abdominal Vessels"
- "Normal Neonatal Brain and Cerebral Malformations"
- Intracranial Hemorrhage and Other Pathologies"
- "Intra-operative Ultrasound of the Brain"
- "Ultrasonic Study of Fetal Growth"

March 1983  Second World Congress on Infant Psychiatry, Cannes, France

- "Psychoactive Agents in Utero: Effects on the Developing Nervous System"
- "Ultrasound Evaluation of the Neonatal Brain"

May 12-14, 1983  Third Annual Conference: The Leading Edge in Diagnostic Ultrasound - Atlantic City, NJ - Sponsored by the Division of Ultrasound and Radiologic Imaging, Department of Radiology, Thomas Jefferson University

- "Assessment of Blood Flow in Abdominal Vessels"
- "Neurosurgical Ultrasonography"
- Meet the Professors - "Techniques and Approaches" - Sessions I-b and II-b: Neonatal Brain (Core Categorical Course) - Pasto, M. and Morgan, P.

May 17, 1983  Greater Delaware Valley Ultrasond Society Home Talent Night, Philadelphia, PA

- "Ultrasonography in Neurosurgery"
June 14, 1983 45th Annual Scientific Meeting of the Committee on Problems of Drug Dependence, Inc., Lexington, Kentucky

- "Cerebral Ventricular Changes in Newborns Exposed to Psychoactive Agents in Utero"

MATTHEW D. RIFKIN, M.D.

October 30, 1982 Mid-Eastern Society of Radiologic Technologists, Wilmington, Delaware

- "Advances in Ultrasound"

November 18, 1982 Our Lady of Lourdes Hospital, Obstetrical and Gynecological Grand Rounds, Camden, NJ

- "Comparison of Ultrasound and Mammography in Diagnosing Breast Lesions"

November 22-26, 1982 Mexico Conference on Advances in Ultrasound, Mexico City, Mexico

- "Ultrasound Mammography"
- "Scrotal Ultrasound"
- "The Prenatal Diagnosis of Congenital Abnormalities"
- "Ultrasonic Gynecological Malignancies"
- "Thyroid and Parathyroid Ultrasound"
- "Ultrasound Evaluation of the Prostate Gland"


- "Transrectal Ultrasonic Evaluation of the Prostate"

January 10, 1982 Greater Delaware Valley Ultrasound Society, Philadelphia PA

- "Ultrasound and Biopsy of the Prostate Gland"

April 15, 1983 George Washington University, Department of Radiology, Washington, D.C.

- "Ultrasound of the Prostate"
Matthew D. Rifkin, M.D. (cont'd)

April 16, 1983  
- "Evaluation of Gynecological Malignancy"
- "Evaluation of in Utero Congenital Abnormalities"

April 30, 1983  
Riverside Hospital Annual Update in Medicine Conference, Wilmington, Delaware
- "Imaging Modalities in Superficial Organs"

May 5, 1983  
Philadelphia Roentgen Ray Society, Philadelphia, PA
- "Sonography and Biopsy of the Prostate"

May 12-14, 1983  
Third Annual Conference - The Leading Edge in Diagnostic Ultrasound - Atlantic City NJ - Sponsored by the Division of Ultrasound and Radiologic Imaging, Department of Radiology, Thomas Jefferson University
- "Ultrasonic Endoscopy"
- Meet the Professors - "Tutorials in Differential Diagnosis" - Sessions I-a and II-a: Superficial Imaging - Pourcelot, A. and Rifkin, M.
- Meet the Professors - "Techniques and Approaches" - Sessions I-b and II-b: Aspiration-Biopsy (Core Categorical Course) - Rifkin, M. and Angelini, L.

May 17, 1983  
Greater Delaware Valley Ultrasound Society, Philadelphia PA
- "Human Ultrasonic Endoscopy for Evaluation of Mural and Extrinsic Lesion of the Upper Gastrointestinal Tract"

May 23-25, 1983  
- "Human Ultrasonic Endoscopy for Evaluation of Mural and Extrinsic Lesions of the Upper Gastrointestinal Tract"
Matthew D. Rifkin, M.D. (cont'd)

May 25-28, 1983
19th Annual Conference of the SMIER (The International Medical Society of Endoscopists and Radiologists), Nancy, France
- "Acoustic Characterization of the Prostate"
- "Endosonographic Evaluation of the Upper Gastrointestinal Tract"

May 31, 1983
The Institut Jean Godinot, Rheims, France
- "New Concepts in Sonographic Evaluation of Malignancy"

DIVISION OF MEDICAL PHYSICS

ROBERT O. GORSON, M.S.

November 27-December 3, 1982
68th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, Illinois
- "Radiation Dosimetry in Diagnostic Radiology" - Refresher Course presented with M. Lassen, Ph.D.

MARGIT LASSEN, Ph.D.

May 25, 1983
Delaware Valley Chapter of American Association of Physicists in Medicine, Philadelphia, PA
- "Purchase Specifications and Site Preparations for NMR Installation"

June 20, 1983
Eastern Shore Medical Symposium: Sponsored by Jefferson Medical College of Thomas Jefferson University, The University of Delaware, and the Medical Society of Delaware
- "Nuclear Magnetic Resonance - Theory and Diagnostic Applications"
DIVISION OF RADIATION BIOLOGY

ROBERT L. BRENT, M.D., Ph.D.

July 8, 1982
Harvard School of Public Health, Harvard University, Boston, Massachusetts
- "Effects of Radiation on the Developing Embryo and Fetus"

September 2-4, 1982
Merck, Sharp & Dome and Council on Drugs of United Kingdom, England
- "Radiation Hazards in Pregnancy"
- "Litigation-Produced Pain, Disease and Suffering"
- "Epidemiology for the Obstetrician"

September 20, 1982
Rohm and Haas, Spring House, PA
- "Reproductive Hazards in the Working Place"

September 23-24, 1982
William Beaumont Army Medical Center, El Paso, Texas
- "Radiation Hazards in Pregnancy"
- "Litigation-Produced Pain, Disease and Suffering"
- "Epidemiology for the Obstetrician"

October 3-5, 1982
Ninth Rochester Trophoblast Conference, Rochester, NY
- "Nutrition and Metabolism in the Trophoblast"

October 11-16, 1982
International Conference on the Prevention of Congenital Malformations, Strasbourg, France
Sponsored by the Institute de la Vie.
- "The Limitations of Animal Experiments in Judging the Teratogenicity of Drugs and Chemicals"
- "The Importance and Magnitude of the Prevention of Congenital Malformations"

October 24-27, 1982
American Academy of Pediatrics, New York
- Round Table: "Preparing for Medicolegal Encounters as a Defendant and Expert Witness"
<table>
<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
</tr>
</thead>
</table>
| November 22-23, 1982| 15th Annual March of Dimes Symposium, NY  
- "Unresolved Problems in Perinatal Medicine" |
| December 4, 1982    | Massachusetts General Hospital, Department of Pediatrics, Boston, Massachusetts  
- "A Radical Look at Pediatric Dermatology"  
- "The Papulosquamous Diseases"  
- "Alopecia - Diagnosis and Treatment" |
| January 10, 1983    | Special Board of Inquiry on Depo-Provera, Food and Drug Administration, Washington, D.C.  
- "Evaluation of Teratogenicity of Sex Steroids" |
| January 17, 1983    | Ross Laboratories, Columbus, Ohio  
- "Embryonic Nutrition" |
| March 2, 1983       | The Catholic Medical Center of Brooklyn and Queens, New York, OB-Gyn Conference  
- "Radiation Hazards During Pregnancy" |
| March 25, 1983      | The Mt. Sinai Medical Center, Cleveland, Ohio  
Symposium on Controversial Aspects of Obstetrics and Gynecology"  
- "Therapeutic Intervention in Pregnancy and the Physician's Responsibility"  
- "Drugs and Pregnancy"  
- "Radiation Hazards During Pregnancy" |
| April 25-26, 1983   | Postgraduate Course on Human Teratogens, Massachusetts General Hospital, Boston, Massachusetts  
- "Litigation-Produced Pain, Disease and Suffering"  
- "Radiation Effects on the Developing Embryo" |
May 3-5, 1983  American Pediatric Society/Society for Pediatric Research Meetings, Washington, D.C.
- "Nutritive Role of the Rat Visceral Yolk Sac and Mechanism of Teratogenesis"
- "Utilization of the Endocytic Index for Assaying Teratogenic Antiserum"
- "The Incidence of Leukemia in C58BL and BALB/c Mice Exposed to X-irradiation In Utero and During the Postpartum Period"

May 6, 1983  American Cleft Palate Association 40th Annual Meeting, Indianapolis, Indiana
- "Etiology of Human Malformations"
- "Litigation-Produced Pain, Disease and Suffering"

May 10-11  American College of Obstetricians and Gynecologists Postgraduate Course in Teratology, Atlanta, GA
- "Legal Aspects of Teratology: Role of Scientists in Evaluating the Allegations of Teratogenicity"
- "Radiation Hazards"

June 1, 1983  Annual Postgraduate Education Day, Upstate Medical Center, Syracuse, NY
- "The Medical-Legal Encounter"

June 6-8, 1983  Harvard School of Public Health, Course on Biological Effects of Ionizing Radiation, Boston, Massachusetts
- "Effects of Radiation on the Developing Embryo and Fetus"

- "Radiation and Pregnancy"
- "Litigation's Side Effects"
Robert L. Brent, M.D., Ph.D. (cont'd)

June 27, 1983
Teratology Society Meetings, Atlantic City, NJ

- "The Bendectin Saga: Another American Tragedy (Brent, '80)
- "Nutritive Role of the Rat Visceral Yolk Sac and a Mechanism of Teratogenesis"
- "The Role and Conduct of Consultants and Expert Witnesses in Determining the Etiology of Human Malformations"
- "X-irradiation Induced Leukemia in C58BL and BALB/c Mice Exposed In Utero and During the Postpartum Period"
- "The Localization of Yolk Sac Antibodies in the Rat Prepared from Yolk Sac Proteins Prepared by Isoelectric Focusing"

THOMAS R. KOSZALKA, Ph.D.

April 1983
University of Delaware Conference on Early Mammalian Development

- "The Uptake of 2-deoxyglucose by the Rat Visceral Yolk Sac"

April 1983
Mid-Atlantic Conference of the Society for Developmental Biology, Thomas Jefferson University, Philadelphia, Pa

- Session Chairman: "Gene Expression in Development"
B. Exhibits

August 1-5, 1982
24th Annual Meeting of the American Association of Physicists in Medicine, New Orleans, Louisiana
- "Magnified Radiographic Images Using Optical Compound Microscopes"

November 28-December 3, 1982
68th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, Illinois
- "Photomicrographs of Breast Calcifications: Correlation with Histopathologic Diagnosis"
  Selected on site for publication in RADIOGRAPHICS, and for Category I CME Credit for Radiologists

April 18-22, 1983
83rd Annual Meeting of the American Roentgen Ray Society, Atlanta, Georgia
- "Applications of Yttrium Filter"
JACK EDEIKEN, M.D.

Serving as a member of the Board of Trustees of the American Board of Radiology, a six-year term of office which began January 1, 1981.

Serving as President of the International Skeletal Society from 1982 to 1984.

Serving as Chairman of the Commission on Diagnostic Radiology of the American College of Radiology since 1982.

Serving as Chairman, Co-chairman, or member of the following committees within the Commission on Diagnostic Radiology of American College of Radiology:

- Committee on ACR Symposia (member)
- Committee on Professional Self-Evaluation and Continuing Education (member)
- Committee on Systematized Refresher Courses (Co-chairman)
- Committee on Learning Laboratories (member)

Serving on the Faculty of ACR Symposia: "Best of the Seminars" and "Best of the Seminars II" - Coordinator of Section on Bone.

FOURTH MALCOM B. HANSON MEMORIAL LECTURER Award from University of Minnesota, Minneapolis, September 1982.

STEPHEN A. FEIG, M.D.

Serving on the following committees under the Division of Diagnostic Radiology of the American College of Radiology:

- Committee on Mammography and Breast Diseases
- Committee on Professional Self-Evaluation and Continuing Education
- Committee on Professional Self-Evaluation and Continuing Education, Chairman of the Section on Breast Diseases.

Stephen A. Feig, M.D. (cont'd)

Member, National Council of Radiation Protection and Measurements, Scientific Committee 72: Mammography

Member, Breast Task Force, Plan for Diagnostic Radiology Research, Conjoint Committee of AUR, ACR, ARRS, RSNA

Moderator, Session on Detection and Diagnosis, International Copenhagen Symposium on Detection of Breast Cancer, Copenhagen, Denmark, August 267-28, 1982.

RICHARD B. LEVINE, M.D.

Re-elected to the Board of the American Association of Medical Legal Malpractice Arbitrators

Nominated to Fellowship in the American College of Radiology

ESMOND MAPP, M.D.

Member, Board of Directors, Section on Radiology, National Medical Association.

Member, Board of Directors, Pennsylvania Radiologic Society.

Member, Fellowship Committee, Philadelphia Roentgen Ray Society, American College of Radiology

A. EDWARD O'HARA, M.D.

Appointed Lifetime Member of the Alumni Association of Jefferson Medical College of Thomas Jefferson University.

ROBERT M. STEINER, M.D.

Chairman, Fellowship Training Committee of the Society of Thoracic Radiology

Member, Publications Committee, Society of Thoracic Radiology

Chairman, Graduate Education Committee, Philadelphia Roentgen Ray Society

Member Board of Directors, Pennsylvania Radiology Society
YEN WANG, M.D., D.Sc.(Med.)

Chairman, Committee on Digital Radiography, American College of Radiology

RICHARD WECHSLER, M.D.

Member, Graduate Course Committee, Philadelphia Roentgen Ray Society, 1983-1984.

DIVISION OF ULTRASOUND AND RADIOLOGIC IMAGING

CATHERINE COLE-BEUGLET, M.D.

Fellow of the American College of Radiology, September 1982

BARRY B. GOLDBERG, M.D.

Treasurer, World Federation for Ultrasound in Medicine and Biology, 1982-1983

ALFRED B. KURTZ, M.D.

Vice-President, Greater Delaware Valley Ultrasound Society, 1982-1983.

DIVISION OF MEDICAL PHYSICS

ROBERT O. CORSON, M.S.

Member, Board of the Ad Hoc Advisory Committee on Toxic Air Pollutants, City of Philadelphia.

MARGIT LASSEN, Ph.D.

American Association of Physicists in Medicine (AAPM)

- Member of the Board
- Member of the Professional and Clinical Relations Committee
- Member of the Nuclear Magnetic Resonance Committee
- Member of the Site Planning Task Force
- Member of the CT Report Task Force

Member of the Professional Affairs Committee of the Delaware Valley Chapter of AAPM
Margit Lassen, Ph.D. (cont'd)

Radiological Society of North America (RSNA)
- Refresher Course Faculty
- Refresher Course Committee Member
- Physics Panel Member - Radiographics
- Presiding Officer of Scientific Session

Member of the Education Committee of the Society of Magnetic Resonance in Medicine (SMRM)

BENJAMIN M. GALKIN, M.S.

Fellow of the American College of Radiology, September 1982

DIVISION OF RADIATION BIOLOGY

ROBERT L. BRENT, M.D., Ph.D.

Re-elected for a five-year term as Editor-in-Chief of Teratology

Awarded Lady Davis Scholar Award by Hadassah Medical Center, Hebrew University, 1983-1984

Travelling Lectureships, sponsored by the Japanese Ministry of Health, the Yondata Corporation, and the Japanese Teratology Society

Appointed to the Fertility and Maternal Health Drug Committee of the Food and Drug Administration

Appointed as Associate Editor of Pediatrics, Risk Analysis, and Fetal Medicine.

RONALD P. JENSH, Ph.D.

Men of Achievement - 1982-1983

International Book of Honor - 1983
Ronald P. Jensh, Ph.D. (cont'd)

Community Leaders of America - 1982-1983


Personalities of the World - 1983

THOMAS R. KOSZALKA, Ph.D.

Mid-Atlantic Conference of the Society for Developmental Biology - Chairman of Session: "Gene Expression in Development."

* * * * * * * * * * * * * * * * * * * * * * * * * *
XI. OTHER IMPORTANT ITEMS

JACK EDEIKEN, M.D.

Co-Editor, Critical Reviews in Clinical Radiological Sciences
Editor-in-Chief, Skeletal Radiology, Journal of the International Skeletal Society
Consultant Editor, Radiology
Consultant, Computerized Tomography (an international medical journal)
Consultant Editor, American Journal of Roentgenology
National Consultant Emeritus to the Surgeon General of the United States Air Force
Consultant to Veterans Administration Hospital, Philadelphia PA
Consultant to Veterans Administration Hospital, Wilmington DE
Consultant in Diagnostic Radiology, M. D. Anderson Hospital and Tumor Institute, University of Texas, Houston TX
Member, Channel 10 Medical Advisory Board, WCAU-TV, Philadelphia PA

STEPHEN A. FEIG, M.D.

Editorial Board, The International Journal of the Breast and Mammary Pathology
Editorial Consultant, American Journal of Roentgenology
Guest Referee, Investigative Radiology

CARLOS GONZALEZ, M.D.

Special Reviewer, Diagnostic Radiology and Nuclear Medicine Study Section, National Institutes of Health, Bethesda, Maryland, 1982-1983

RICHARD B. LEVINE, M.D.

Clinical Liaison Teaching Associate, Warminster General Hospital, Warminster PA
Clinical Consultant, Radiology Department, Warminster General Hospital
VIJAY MADAN RAO, M.D.
Invited Referee for CRC in Diagnostic Radiology

YEN WANG, M.D., D.Sc.(Med.)
Editor, Journal of Critical Reviews in Diagnostic Images

DIVISION OF ULTRASOUND AND RADIOLOGIC IMAGING

OKSANA H. BALTAROWICH, M.D.
Clinical Liaison Teaching Associate, Harvard Medical School, Boston, Massachusetts

BARRY B. GOLDBERG, M.D.
Member, Channel 10 Medical Advisory Board, WCAU-TV, Philadelphia PA

DIVISION OF MEDICAL PHYSICS

BENJAMIN M. GALKIN, M.S.
Invited by the National Institutes of Health Breast Cancer Task Force to present research findings on breast calcification.

DIVISION OF RADIATION BIOLOGY

ROBERT L. BRENT, M.D., Ph.D.
As a member of the Fertility and Maternal Health Drug Committee, Food and Drug Administration, participated in Federal Government Hearings on Premenstrual Tension Discussion, and meeting on the Use of Oral Contraceptives.

* * * * * * * * * * * * * * * * * * * * * *
ADDENDUM

OFFICE OF RADIATION SAFETY

1982 ANNUAL REPORT
<table>
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<th>TABLE OF CONTENTS</th>
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<td>Statistics on Personnel Monitoring</td>
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<td>Statistics on Receipt and Disposal of Radioactive Materials</td>
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<td>Summary Report on Personnel Monitoring</td>
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<td>Summary Report on Thyroid Monitoring</td>
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<td>Summary Report on Air Sampling</td>
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<td>Summary Report on Urinalysis for Tritium</td>
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<td>Summary of Radioisotope Inventory</td>
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<td>New Radioisotope Licenses Issued</td>
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<td>Radioisotope Radiation Safety Sessions</td>
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<td>X-Ray and Microwave Equipment and Electron Microscopes</td>
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<tr>
<td>Funded Research</td>
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<tr>
<td>Invention</td>
</tr>
</tbody>
</table>
The Office of Radiation Safety continued to be very busy during 1982. Summary reports of some specific activities are attached and some typical statistics are listed below.

<table>
<thead>
<tr>
<th></th>
<th>1982</th>
<th>1980</th>
<th>Change in 1982</th>
</tr>
</thead>
<tbody>
<tr>
<td>number of persons monitored by film badges</td>
<td>996</td>
<td>1,004</td>
<td>-0.8%</td>
</tr>
<tr>
<td>number of film badges used</td>
<td>8,160</td>
<td>8,300</td>
<td>-1.7</td>
</tr>
<tr>
<td>amount of radioactivity received</td>
<td>489,198.53 mCi</td>
<td>362,251.25 mCi</td>
<td>+35%</td>
</tr>
<tr>
<td>amount of radioactivity disposed of via commercial service</td>
<td>314.73 mCi</td>
<td>458.80 mCi</td>
<td>-31.4%</td>
</tr>
<tr>
<td>volume of insoluble radioactive waste disposed of via commercial service</td>
<td>3,350 gallons</td>
<td>4,330 gallons</td>
<td>-22.6%</td>
</tr>
</tbody>
</table>

The number of persons monitored in 1982 for occupational exposure to ionizing radiation was approximately the same as in 1981. We expect that this number will remain about the same or increase slightly in 1983.

The 35% increase in the amount of radioactivity received is due in large measure to increased patient use in the Department of Radiation Therapy and Nuclear Medicine.

The amount of radioactivity disposed of by commercial service declined by 31.4%. Most of this decrease is the result of changes in NRC regulations which allow liquid scintillation media and animal carcasses containing ≥0.05 μCi/gm of C-14 or H-3 to be disposed of without regard to the radioactive content. In addition, increased use of decay-to-background techniques for short half lived isotopes, especially in Nuclear Medicine, contributed to the decline. A continuation of this trend is expected, and a further decrease of approximately 30% is anticipated for 1983. However, further regulation changes are also expected to entail more stringent record keeping and packaging requirements which will involve more personnel man hours per volume of waste disposed.
SUMMARY OF PERSONNEL MONITORING PROGRAM FOR 1982

ALARA EVALUATION

Whole Body Monitoring

Over 8,100 film badges were used during the period of 1/1/82 to 12/31/82 to monitor persons who, by the nature of their duties, were occupationally exposed to x radiation, y radiation, and/or energetic β radiation. About 75% of these people were Hospital based in the Departments of Radiology, Radiation Therapy, Cardiology, Hematology, Nursing, etc. The other 25% were College based.

Over 99% of the 996 persons monitored for whole body exposure received less than 20% of the maximum permissible dose. The 2 people whose badge readings totaled more than 1 rem wore their film badges outside their lead aprons during fluoroscopy and all readings were < 1.1 rem for the year.

Hand Monitoring

Of the 996 persons monitored for whole body exposure 73 were also monitored for possible exposure to the hands. These persons routinely handled milli-curie amounts of gamma emitting radionuclides or else routinely performed special x-ray studies. Of these only one received 27% of the maximum permissible hand dose. Everyone else received less than 7% of the maximum permissible hand dose.

Eye-Head Monitoring

Sixteen physicians who routinely performed special x-ray studies were also monitored for possible exposure to the eyes. Fifteen received less than 10% of the maximum permissible eye dose. One person received 36% of the maximum permissible eye dose.

Radiation Exposure during X-ray Special Procedures

The one person who received the high hand and eye readings does most of the x-ray special procedures in the hospital. This matter was an agenda item at the last Radiation Safety Committee Meeting and appropriate action is being taken to limit his exposure.
### Table I

#### 1982

**ANNUAL DOSE RANGES**

(in rems)

<table>
<thead>
<tr>
<th>ANNUAL DOSE RANGES</th>
<th>NUMBER OF PERSONS IN EACH RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BODY</strong></td>
<td><strong>HANDS</strong></td>
</tr>
<tr>
<td>no measurable exposure (m)</td>
<td>502</td>
</tr>
<tr>
<td>measurable exposure 0.010-0.100</td>
<td>429</td>
</tr>
<tr>
<td>0.101 - 0.250</td>
<td>46</td>
</tr>
<tr>
<td>0.251 - 0.500</td>
<td>13</td>
</tr>
<tr>
<td>0.501 - 0.750</td>
<td>4</td>
</tr>
<tr>
<td>0.751 - 1.000</td>
<td>-</td>
</tr>
<tr>
<td>1.001 - 2.000</td>
<td>2</td>
</tr>
<tr>
<td>3.800</td>
<td>-</td>
</tr>
<tr>
<td>4.310</td>
<td>-</td>
</tr>
<tr>
<td>20.310</td>
<td>-</td>
</tr>
<tr>
<td><strong>TOTALS:</strong></td>
<td>996</td>
</tr>
</tbody>
</table>

#### LENGTH OF TIME MONITORED

<table>
<thead>
<tr>
<th>LENGTH OF TIME MONITORED</th>
<th>NUMBER OF PERSONS IN EACH RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 3 months</td>
<td>Body</td>
</tr>
<tr>
<td>286</td>
<td>13</td>
</tr>
<tr>
<td>232</td>
<td>24</td>
</tr>
<tr>
<td>167</td>
<td>12</td>
</tr>
<tr>
<td>311</td>
<td>24</td>
</tr>
<tr>
<td><strong>TOTALS:</strong></td>
<td>996</td>
</tr>
</tbody>
</table>
During 1982, the Radiation Safety staff performed 95 thyroid counting procedures on 28 individuals who could have been exposed to radioiodine during the course of their work. As indicated by the results from these procedures, most of these individuals received little or no measurable thyroid doses due to radioiodine. All doses were well below maximum permissible limits for thyroid exposure (8 rems per calendar quarter or 30 rems per year). Results of the monitoring program are summarized below.

<table>
<thead>
<tr>
<th>Range of Thyroid Dose to Each Individual</th>
<th>Number of Individuals</th>
</tr>
</thead>
<tbody>
<tr>
<td>less than 0.01 rem</td>
<td>19</td>
</tr>
<tr>
<td>0.01 to 0.1 rem</td>
<td>5</td>
</tr>
<tr>
<td>0.11 to 0.5 rem</td>
<td>4 [highest 0.41 rem]</td>
</tr>
</tbody>
</table>

**AIRBORNE RADIOACTIVITY**

Air samples were collected during 95 iodination and 17 xenon-133 procedures to quantitate the airborne release of radioactivity to controlled and uncontrolled areas. The results indicate that average yearly maximum permissible concentrations were not exceeded.

**URINALYSIS FOR TRITIUM**

In addition to urinalyses performed under the supervision of the individual licensees, the Office of Radiation Safety performed 3 urinalyses for tritium on 2 individuals who handled bulk quantities of tritium (\( \geq 25 \text{ mCi} \)). Measured body burdens of tritium in all cases were less than 0.25% of the maximum permissible body burden.
## RADIOISOTOPE INVENTORY CONTROL REPORT

### RECEIPT

<table>
<thead>
<tr>
<th>Isotope</th>
<th>Activity (millicuries)</th>
</tr>
</thead>
<tbody>
<tr>
<td>H-3</td>
<td>540.41</td>
</tr>
<tr>
<td>C-14</td>
<td>67.01</td>
</tr>
<tr>
<td>Cr-51</td>
<td>113.97</td>
</tr>
<tr>
<td>Fe-59</td>
<td>4.37</td>
</tr>
<tr>
<td>P-32</td>
<td>50.3</td>
</tr>
<tr>
<td>S-35</td>
<td>62.00</td>
</tr>
<tr>
<td>Se-75</td>
<td>1.5</td>
</tr>
<tr>
<td>Ga-67</td>
<td>1,919.45</td>
</tr>
<tr>
<td>Mo-99</td>
<td>193,752.00</td>
</tr>
<tr>
<td>In-111</td>
<td>51.67</td>
</tr>
<tr>
<td>Rb-86</td>
<td>2.00</td>
</tr>
<tr>
<td>I-123</td>
<td>2.6</td>
</tr>
<tr>
<td>T1-201</td>
<td>1,428.8</td>
</tr>
<tr>
<td>I-125</td>
<td>860.42</td>
</tr>
<tr>
<td>I-131</td>
<td>2,187.78</td>
</tr>
<tr>
<td>Xe-133</td>
<td>33,130.00</td>
</tr>
<tr>
<td>Tc-99m</td>
<td>254,082.00</td>
</tr>
<tr>
<td>Co-57</td>
<td>0.17</td>
</tr>
<tr>
<td>Co-58</td>
<td>0.08</td>
</tr>
<tr>
<td>Ir-192</td>
<td>306.00</td>
</tr>
<tr>
<td>Au-198</td>
<td>636.00</td>
</tr>
<tr>
<td><strong>TOTALS:</strong> 489,198.53 mCi</td>
<td></td>
</tr>
</tbody>
</table>

### DISPOSAL (in approximate millicuries)

<table>
<thead>
<tr>
<th>Isotope</th>
<th>via sewer system</th>
<th>released to atmosphere</th>
<th>via commerical service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-57</td>
<td>0.42</td>
<td>-</td>
<td>0.03</td>
</tr>
<tr>
<td>P-32</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Ca-45</td>
<td>0.001</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>I-131</td>
<td>-</td>
<td>-</td>
<td>2.0</td>
</tr>
<tr>
<td>H-3</td>
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<td>Fe-59</td>
<td>0.27</td>
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<td>I-125</td>
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<tr>
<td>Xe-133</td>
<td>-</td>
<td>2,548.00</td>
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<td>Se-75</td>
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<tr>
<td>Cr-51</td>
<td>33.2</td>
<td>-</td>
<td>3.6</td>
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<td><strong>TOTALS:</strong> 217.241 mCi</td>
<td>2,548.00 mCi</td>
<td>314.73 mCi</td>
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<td>Licensee and Department</td>
<td>Radioisotope</td>
<td>Possession Limit</td>
<td>Purpose</td>
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<tr>
<td>Carmen Merryman, M.D.</td>
<td>H-3</td>
<td>1 mCi</td>
<td>Iodination of synthetic polymers of amino acids, immunoglobulins or proteins to be used in radioimmunoassays in vitro. H-3 for T-cell proliferation assays in vitro and Cr-51 for release assays in vitro.</td>
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<tr>
<td>Biochemistry</td>
<td>Cr-51</td>
<td>1 mCi</td>
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<td></td>
<td>I-125</td>
<td>4 mCi</td>
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<td>Steven R. Peikin, M.D.</td>
<td>Ca-45</td>
<td>1 mCi</td>
<td>To study Ca(^{2+}) flux in smooth muscle strips and to measure cyclic AMP and cyclic GMP levels in dispersed pancreatic acini.</td>
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<td>Gastroenterology</td>
<td>I-125</td>
<td>5 mCi</td>
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<td>Anthony J. Triolo, Ph.D.</td>
<td>C-14</td>
<td>15 mCi</td>
<td>Radiolabelled microspheres and labelled antipyrine will be used to study cerebral blood flow in vivo following stroke in cats. Labelled cyclic nucleotides will be used for measuring cyclic AMP and GMP in cats and rodents. Labelled benzo(a)pyrene to determine effects of pesticides on this compound in vivo (mice) and in vitro. DNA turnover in vivo (mice) and in vitro will be studied using labelled thymidine. Incorporate the 133-Xe method of measuring cerebral blood flow in experiments on the treatment of stroke.</td>
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<tr>
<td>Pharmacology and Neurosurgery</td>
<td>Gd-153</td>
<td>3 mCi</td>
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<td></td>
<td>Co-57</td>
<td>3 mCi</td>
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<td>Ce-141</td>
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<tr>
<td></td>
<td>Cr-51</td>
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<td>Sn-113</td>
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<td>Ru-103</td>
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<tr>
<td></td>
<td>Nb-95</td>
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<tr>
<td></td>
<td>Sc-46</td>
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<td></td>
<td>H-3</td>
<td>102 mCi</td>
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<td>I-125</td>
<td>0.06 mCi</td>
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<td></td>
<td>Xe-133</td>
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<td>Francis E. Rosato, M.D.</td>
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<td>10 mCi</td>
<td>Liver perfusion studies in vitro and in rats.</td>
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<td>Surgery</td>
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<td></td>
<td>C-14</td>
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<tr>
<td>Henry Scovorn, M.D.</td>
<td>H-3</td>
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<td>Quantitation of proliferating cells. Labelling lymphocytes to determine trafficking. Studies in vitro and in vivo (mice).</td>
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<td>Medicine</td>
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<tr>
<td></td>
<td>In-111</td>
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Radioisotope Radiation Safety Induction Sessions

The Office of Radiation Safety conducted six (6) sessions for isotope users to acquaint them with radiation safety practices and policies at Jefferson.

X-Ray Equipment

Radiation Safety surveys of all x-ray equipment in the College, Allied Health Sciences Center and Hospital, continued on a regularly scheduled basis throughout the year. These surveys were conducted by or under the supervision of the Medical Physics Division and the Office of Radiation Safety.

Microwave Equipment and Electron Microscopes

All microwave equipment and electron microscopes were checked by the Radiation Safety staff.

Funded Research

An NIH Grant was funded for a 2nd year for the period December 1, 1981 through November 30, 1982. B.M. Galkin, Principal Investigator, with Dr. S.A. Feig, Department of Radiology and Dr. P. Frasca, Department of Orthopaedic Surgery, co-investigators.

Invention

The U.S. Patent Office has notified Jefferson that a second patent will be issued on syringing shields entitled "Radioactive Material Loading, Calibration and Injection Systems". The inventors, B.M. Galkin, R. Brown, R. Gilliam and C. Park have assigned the patent to Thomas Jefferson University. Attempts to commercialize this patent are presently under way.
MEMBERS

Prof. Paul Maurer, Chairman
Prof. Robert Brent
Prof. Jack Edeiken
Mr. Paul Fullagar
Prof. Benjamin Galkin
Prof. Robert Gorson
Prof. Simon Kramer
Prof. Hyman Menduke
Prof. Charles Panos
Prof. Chan Park
Mrs. June Tullos, R.N.

MEMBERSHIP OF SUB COMMITTEES

Radioisotope Committee

<table>
<thead>
<tr>
<th>Human Use</th>
<th>Non-Human Use</th>
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<tr>
<td>A. Erslev, Chairman</td>
<td>C. Panos, Chairman</td>
</tr>
<tr>
<td>R. Brent</td>
<td>B. Galkin</td>
</tr>
<tr>
<td>P. Fullagar</td>
<td>J. Heaton</td>
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<td>B. Galkin</td>
<td>M. Thakur</td>
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<td>R. Gorson</td>
<td>A. Zeiger</td>
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<td>C. Park</td>
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<td>J. Tullos</td>
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</table>

X-Ray Committee

N. Suntharalingam, Chairman
G. McArdle
P. Fullagar
B. Galkin
M. Lassen
R. Rowley
G. Shaber
L. Tate

Non-Ionizing Radiation Committee

T. Behrendt, Chairman
B. Galkin
B. Goldberg
P. Katz
I. Weinberg
C. Wilpizeski

OFFICE OF RADIATION SAFETY

Benjamin M. Galkin, Radiation Safety Officer
John C. Keklak, Assistant Health Physicist
Craig Miller, Health Physics Technician
Pat Masters, Administrative Secretary
William Kirby, Radiation Safety Technician

TELEPHONE EXTENSIONS
7813 or 7814