Adrenal masses are common, occurring in up to 9% of the population. Adrenal masses often come to clinical attention when they are discovered incidentally on a cross sectional imaging study performed for another reason. The likelihood that an adrenal “incidentaloma” will be malignant is quite low (<5%) if the patient does not have a known primary cancer and has no clinical or biochemical evidence of adrenal hyperfunction. The most likely diagnosis for an adrenal incidentaloma is a non-functioning adenoma. This benign tumor is the most common adrenal lesion in the general population. For cancer patients, especially those with lung cancer, the situation is quite different. Up to 25% of adrenal masses in these patients will be metastatic disease. The clinical management of a new adrenal mass usually begins by determining if the lesion is benign or malignant. The methods available to accomplish this task include computed tomography (CT), magnetic resonance imaging (MRI), scintigraphy (e.g., MIBG, NP-59, octreotide, PET), adrenal vein sampling, percutaneous biopsy, and surgical resection. This Update will focus on the role of adrenal MRI.

When performed by an experienced radiologist using modern equipment, MRI is a superb modality for detecting and characterizing adrenal masses. Multiplanar MR imaging clearly depicts anatomic relationships and can show whether a mass arises from the adrenal gland or from nearby organs, such as the kidney or the liver. The power of MRI lies in (continued on page 2)
Notes from the Chair

As many of you know, Dr. Michael Vannier, Professor and Head of the Department of Radiology, decided to leave the chair’s position to be able to devote his activities to scientific research. Indeed, in the near future The University of Iowa will share Dr. Vannier on an equal time basis with the National Cancer Institute as he assumes a major position there. Thus, after seven years of no departmental administrative duties, I am back on the job as Interim Chair of Radiology. A search is underway for a permanent department head, and an appointment will probably be announced in the near future. I find that serving on an interim basis is difficult, mainly because there is so much happening it is hard to stay on top.

Dr. William Yuh, Director of Neuroradiology and MRI at the University of Iowa, recently left us to become Professor and Chair at the University of Oklahoma School of Medicine. Dr. Nina Mayr, Dr. Yuh’s spouse, simultaneously became Chief of Radiation Oncology at that institution, so one of my first jobs was to fill the position of neuroradiology director. I am happy to announce a successful recruitment for that critical position, Dr. Wendy Smoker. A number of faculties in other sections will join us in the immediate future. They include radiologists in body and breast imaging, chest, interventional radiology, and neuroradiology.

The Education Program continues to gain in quality. After the departure of Dr. Mary Kathol to the Oregon Health Sciences University in Portland, Oregon, Dr. Brian Mullan assumed educational coordination of medical student activities. Dr. Joan Maley has agreed to inherit the responsibility for the Diagnostic Radiology Residency program from Dr. Brad Thompson.

The clinical service is booming, particularly in complex studies. To assist us with organization of the clinical workload, Dr. Brad Thompson has been appointed Director of General Radiology Services.

The multiple research activities of the faculty are flourishing and growing. Even at the risk of not crediting everyone I should, I mention Dr. Eric Hoffman’s recent NIH grant, which allowed installation of a research CT scanner, and Dr. Ge Wang’s research program, which has been funded for sophisticated imaging processing as well as a micro CT.

You will realize from the above that, even on an interim basis, the Department of Radiology at The University of Iowa is a vital and active organization, with explosive growth occurring in education, research, and clinical service.

Edmund A. Franken, Jr., MD
Professor and Interim Head, Department of Radiology

(continued from first page)

its ability to distinguish between adrenal adenoma and metastasis based on lesion fat content. Seventy to ninety percent of adenomas — both functioning and non-functioning — contain abundant intracytoplasmic lipid, whereas other adrenal masses, including metastases, are largely composed of water and contain little fat (myelolipoma is an exception). The most sensitive MR technique for detecting intracytoplasmic lipid is Chemical Shift Imaging (CSI). CSI exploits a small difference in the resonance frequencies of fat and water protons. (The chemists among you will recall that hydrogen nuclei in fat are more heavily shielded from the applied magnetic field than those in water and therefore resonate at a lower frequency.) Because the frequency difference is proportional to magnetic field strength, CSI is best performed on a high field MRI scanner, such as the 1.5T units. CSI consists of a pair of axial or coronal T1-weighted gradient echo images: one image is “in-phase” (TE 4.2 msec) and the other is “out-of-phase” (TE 2.1 msec). The MR signals from fat and water sum on the in-phase image and cancel on the out-of-phase image. Thus, an adrenal adenoma containing both fat and water will lose signal intensity on the out-of-phase image as compared to the in-phase image. The signal loss should be uniform across the lesion. Additional imaging features that suggest a benign etiology of a suspected adrenal adenoma include homogeneous appearance, intermediate signal intensity on T1- and T2-weighted images, smooth margins, and small size (<4 cm). Overall, CSI has a sensitivity of 81-100% and a specificity of 94-100% for distinguishing adrenal adenoma from metastasis. Atypical adenomas comprise lesions that are lipid-poor, large (>4cm), hemorrhagic, necrotic, or calcified. These adenomas cannot be confidently characterized as benign on CSI and may require biopsy or close follow-up. Other benign lesions that can be diagnosed with MRI include adrenal cyst and pseudocyst, hemorrhage, and myelolipoma.

Non-contrast CT is often the initial imaging study for evaluating an adrenal mass. Adenoma is diagnosed when the CT attenuation value is less than 10 HU. Although MRI is more sensitive than CT for distinguishing adenoma from metastasis, MRI has remained a problem solving modality due to its higher cost. However, when the results of an adrenal CT are equivocal, MRI is a more cost effective next step than biopsy. MRI saves money by reducing the frequency of biopsy (with its attendant complications) and eliminating the need for costly serial follow-up CT examinations. Unfortunately, the merits of adrenal MRI are not widely appreciated, and this modality is underutilized at our institution and elsewhere. Physician education holds the key to improving clinical practice.
Sectional Update
Interventional Neuroradiology

Clinical Service
The Section of Interventional Neuroradiology operates as a unique interdisciplinary subspecialty, providing an expanding range of tertiary clinical services for the diagnosis and treatment of many neurovascular, head and neck, and spinal diseases. Delivery of these clinical services requires close coordination and collaboration with several other clinical disciplines, including neurosurgery, neurology, otorhynology, ophthalmology, and radiation oncology. Currently, one of the main thrusts of clinical activities focuses on the delivery of around-the-clock consultation and therapeutic intervention for many types of cerebrovascular disease, using minimally invasive image-guided surgical techniques. In particular, endovascular surgery performed through digitally enhanced fluoroscopic guided micro-catheterization of the brain and spinal cord has become the cornerstone of such image-guided techniques, being increasingly utilized as a result of the tremendous technologic and technical innovation occurring over the last decade. Consequently, neuro-endovascular surgery is now increasingly becoming a prominent and essential element in many multimodality therapeutic paradigms, and in many cases, as the preferred primary therapeutic modality.

The Section of Interventional Neuroradiology has undergone an enormous expansion of activities, beginning with the recruitment of John C. Chaloupka, MD as the Director of this newest of sections within the Department of Radiology. Through forming close interdisciplinary ties with the Departments of Neurosurgery and Neurology, there has been particularly rapid growth in providing neuro-endovascular surgical treatment of many causes of both hemorrhagic and thromboembolic stroke. Prior to Dr. Chaloupka’s arrival in late 1999, less than 70 neurointerventional cases were performed annually. Since then, within a period of less than three years, the Section is currently projected to perform over 450 cases annually. This dramatic rise in clinical volume has made UIHC one of the six busiest centers in the entire nation, as well as the busiest in the Midwest region. The largest areas of growth in clinical volume over the last two years include: endovascular surgical management of intracranial aneurysms (approximately 100 cases/yr), extracranial carotid angioplasty and stenting (also approximately 100 cases/yr), intracranial angioplasty and stenting, acute stroke revascularization, and therapeutic embolization of high flow cerebrovascular malformations. The Section is also anticipating several other areas of clinical expansion over the next 1-2 years, including percutaneous vertebroplasty of spinal compression fractures, endovascular and direct puncture management of non-CNS vascular malformations, direct puncture tumor ablation, and intra-arterial antineoplastic therapy.

Research
Clinical Trials- Owing to the explosive growth and evolution of percutaneous catheterization techniques applied to neuro-endovascular surgery, there has been a recent impetus to conduct larger scale, evidence-based clinical research to evaluate the safety and efficacy of emerging technology and techniques. Consequently, several important multi-center clinical trials are either in progress or have been proposed. The Section of Interventional Neuroradiology is fortunate to have been selected as a participating site for the following trials:

1. U.S. Onyx Multicenter Randomized Cerebral Aneurysm Study- Selective equivalency trial comparing conventional endovascular surgery (using endosaccular coil embolization with the GDC system) with liquid polymer embolization (ethylene vinyl alcohol co-polymer- Onyx) of intracranial aneurysms.

2. NEUROLINK Feasibility Study-SSYLVIA Trial (Stenting of Symptomatic atherosclerotic Lesions in the Vertebral and Intracranial Arteries)- Selective multicenter safety and efficacy trial evaluating the use of a dedicated neurovascular stent for the treatment of symptomatic atherosclerotic stenoses of intracranial arteries and the extracranial vertebral artery.


4. SHELTER Trial (Stent Assisted Carotid Angioplasty)- Stenting of High Risk Patients: Extracranial Lesion Trial with Emboli Removal- Selective multicenter safety and efficacy trial evaluating the use of a new monorail self expanding stent and distal emboli protection with a nondetachable balloon for stent-assisted angioplasty of symptomatic carotid atherosclerosis.

5. RPM Reperfusion Device for Ischemic Stroke Study- Multicenter feasibility and safety trial evaluating a novel mechanical thrombolysis device for the treatment of acute thromboembolic stroke in anterior and posterior circulations.

Dr. Chaloupka serves as the local site Principal Investigator for all these trials, as well as the PI for the entire RPM Reperfusion Study. Local co-investigators of all these studies include Jeri Sieren RN (Research and Clinical Nurse Coordinator, INR) and John B. Weigele, MD, PhD (Fellow Associate, INR). Dr. Harold Adams (Director, Cerebrovascular Neurology) is a co-investigator on the SHELTER, SSYLVIA, and RPM studies, and Dr. Patrick Hitchon (Neurosurgery) is a co-investigator on the SHELTER study.

Dr. John B. Weigele is also a co-investigator for the U.S. ABEST (ABciximab in Emergency Stroke Trial) Study, which is a large scale, multicenter randomized trial assessing the safety and efficacy of intravenous administration of the
GPIIb-IIIa inhibitor abciximab (Reopro) for acute stroke. Dr. Weigele is providing core neuro-imaging interpretation and adjudication.

**Laboratory & Translational Research**—Dr. Chaloupka has been or will be involved in several interdisciplinary basic and translational research studies at The University of Iowa in collaboration with the Section of Nuclear Medicine, the Free Radical and Radiation Biology Research Institute, the Department of Biomedical Engineering, the Department of Neurosurgery, and the Iowa Institute of Hydraulic Research, as well as at the Iowa State University in collaboration with The Department of Mechanical Engineering. The following is a partial listing of these projects:

1. Lead Investigator- Basic/Translational Project- Univ. of Iowa Pre-ICMIC
   
   Title: Imaging of gene target sensitivity, transfer, and expression in intra arterial gene infusion; Validation of concept using re-introduction of wild type p53 gene in susceptible neoplasms.
   
   Sponsor: NIH P20 Preliminary Program Project: Intracellular and Molecular Imaging Center (Pre-ICMIC)
   
   Funding: Total project = $450,000; 10% effort; {approved}

2. Co-Investigator- Basic/Translational Project
   
   Title: Accurate Noninvasive Diagnosis of Carotid Stenosis
   
   Sponsor: NIH
   
   Funding: Total project = $1,267,796; 10% effort; {pending}

3. Principal Investigator- Translational/Clinical Project
   
   Title: Pre-Clinical and Clinical Research/Development of Minimally Invasive Image-Guided Therapy Using the Magnetic Surgery System (TechStar)
   
   Sponsor: Stereotaxis, Inc.
   
   Funding: Research grant= $660,000; Equipment grant= $1,000,000

4. Principal Investigator- Translational/Clinical Project
   
   Title: Advanced Clinical Applications of 3D Rotational Digital Subtraction Angiography Combined with Computational Fluid Dynamics (CFD) for the Diagnosis and Treatment of Cerebrovascular Diseases
   
   Sponsor: Siemens Medical Systems
   
   Funding: $80,000 unrestricted grant

5. Co-Investigator- Basic/Translational Project
   
   Title: Advanced Computational Fluid Dynamics Analysis for the Study of Cerebral Aneurysm Hemodynamics
   
   Sponsor: preliminary feasibility, data for pre-RO1 NIH; Dept. Radiology and Hydraulics Institute

6. Co-Investigator- Basic/Translational Project; PI- Michael Olsen Ph.D., Iowa State University; Dept. Mechanical Engineering
   
   Title: A Fluid Mechanics Analysis of Endovascular Surgical Treatment of Aneurysms Using Experimental Micro-Fluidics Techniques
   
   Sponsor: American Heart Association
   
   Funding: Seed Grant ; TBA {pending}

7. Co-Investigator- Basic/Translational Project; Co-Investigators- M. Olsen, Ph.D. & F. Battaglia, Ph.D., Iowa State University; Dept. Mechanical Engineering
   
   Title: Validation of Non-linear, Two Phase Computational Fluid Dynamics (CFD) Modeling of Real Cerebral Aneurysm Geometry Using Micro-Particle Injection Velocimetry (micro-PIV)
   
   Sponsor: Whitaker Foundation
   
   Funding: TBA {pending}

*John C. Chaloupka, MD*

*Director, Section of Interventional Neuroradiology*

---

**Sectional Update**

**Pediatric Radiology**

As the Department of Radiology moves forward in the twenty-first century, the Pediatric Radiology section has been selected to lead the way into a new era of film-less technology. The Pediatric section will begin to read all modalities, including plain radiographs, fluoroscopic studies, ultrasound, MRI and CT in the “soft” format, i.e. online via the PACS network. This should improve efficiency within the Pediatric section, contribute positively to increased patient throughput, and provide more rapid results for our referring clinicians. These new features will be implemented over the next few months. In order for these changes to occur, there will be restructuring of the pediatric film reading room with the addition of PACS terminals and reorganization of the present reading stations into a more organized and accessible work environment. A clinician viewing station and a resident teaching module are anticipated when the entire third floor reading area is renovated.

The issue of radiation safety in pediatric patients has recently been highlighted in the radiology literature as well as in the press. Last February, Dr. Yutaka Sato, Director of Pediatric Radiology, was a guest on National Public Radio where he discussed issues of radiation safety and how UIHC is complying with recommended dose reductions for imaging infants and children. Dr. Sato is spearheading a research project assessing the radiation dosage to children using our multidetector CT scanner with the goal of determining optimal imaging parameters for imaging small children and infants with minimal radiation exposure. While the members of the Pediatric section have always been sensitive to the issues of radiation safety in children, using the minimal dosage of radiation required to obtain the maximum information, they will soon have the opportunity to perform low-dose fluoroscopic procedures with the acquisition of the new state-of-the-art Phillips EasyDiagnost fluoroscopic unit. This versatile new (continued on page 5)
device provides up to 66% reduction in the fluoroscopic dose of radiation. It can be used for all fluoroscopic procedures as well as scout and overhead views as needed. The unit has full PACS capability and will be integrated into the PACS network as soon as it comes online in November of 2001. We look forward to being able to provide fluoroscopic imaging studies with the lowest possible radiation dose.

Mary Patricia Harty, MD
Associate Professor, Section of Pediatric Radiology

New Faculty

D. Lee Bennett, MD

Dr. D. Lee Bennett joined the department in January of 2001. He works in the musculoskeletal section and breast imaging areas. He was most recently an Assistant Professor of Radiology at Michigan State University. He received his radiology training at The University of Iowa.

John Boardman, MD

Dr. John Boardman joined the abdominal imaging section at The University of Iowa Hospitals and Clinics in August of 2000. He completed his residency at St. Luke’s Medical Center in Milwaukee, Wisconsin and finished a body imaging fellowship at The University of Iowa.

Mary Patricia Harty, MD

Dr. Pat Harty joined the pediatric imaging section in October 2000. She comes to The University of Iowa from Philadelphia where she was a member of the staff at The Children’s Hospital of Philadelphia. She is certified by the American Board of Radiology with special competence in Pediatric Radiology. Her special interests include imaging children with ultrasound and MRI as well as radiation protection. Dr. Harty looks forward to collaborating with Drs. Sato, Kao and D’Alessandro of the pediatric imaging section to provide optimal imaging for the pediatric patients at The University of Iowa.

New Fellows

Joshua Bemporad, MD -- Interventional Neuroradiology
   New York Medical College
Mohammad Dogar, MD -- Neuroradiology
   King Edward Medical College Lahore
Michael Fortney, MD -- Musculoskeletal Radiology
   University of North Dakota
Gerald Ondr, MD -- Musculoskeletal Radiology
   University of Missouri-Kansas City
John Weigele, MD, PhD -- Interventional Neuroradiology
   University of Pennsylvania
Fadi Mohamad Youness, MD -- Interventional Radiology
   American University of Beirut

New Residents

Khalil Abu-Zahra, MD
   University of Jordan
Marc Beck, MD
   The University of Minnesota
Andy Ellingson, MD
   The University of Iowa
Ahmed Fathala, MD
   Alexandria University, Egypt
David Rideout, MD
   The University of Iowa
Fiorenza Ianzini, PhD

Dr. Fiorenza Ianzini received her PhD in Biology from the Università di Roma “La Sapienza” in Italy and performed her postdoctoral studies at the University of Wisconsin - Madison. Before coming to the U.S., Dr. Ianzini conducted her research at the Italian National Institute of Health as a Research Scientist in the Division of Biophysics and as Visiting Scientist in various laboratories in Europe and the U.S. Most recently she was an Assistant Professor of Radiology in the Cancer Biology Section at the Mallinckrodt Institute of Radiology and moved to Iowa City in August 2000 where she joined the faculty of the Department of Radiology. She has adjunct faculty appointments with the Departments of Radiation Oncology and Biomedical Engineering and is the Director of the Quantitative Real-Time Cell Analysis Facility.

Malik Juweid, MD

Malik Juweid, Associate Professor, is a new staff physician in Nuclear Medicine. He graduated from the University of Heidelberg Medical School in Germany in 1986 and completed three years of training at Heidelberg’s University Hospital in 1989. He then moved to the U.S. where he completed fellowships at Massachusetts General Hospital, NIH, and The University of Pennsylvania. He is Board-certified in Nuclear Medicine and has served as principal investigator on multiple NCI- and FDA-funded grants dealing with radioimmunotherapy and combined-modality treatment of cancer. He comes to Iowa City with his wife Kawthar and daughter Nadine age 5 years.

Michael Mackey, PhD

Dr. Michael Mackey received his PhD in Biophysics in 1988 from the University of California, Berkeley and San Francisco. At Mallinckrodt Institute of Radiology, he was on the faculty in Cancer Biology. In August 2000, he joined the faculty at The University of Iowa as Associate Professor of Biomedical Engineering and Radiology. Research interests include the study of cell cycle regulation in mammalian cells and the development of thermodynamic theories of living systems. He has developed an automated microscope system and large-scale digital analysis system for use in basic studies of cellular phenomena. Drs. Mackey and Ianzini are establishing the Quantitative Real-Time Cell Analysis Facility, a University-wide research facility associated with the Central Microscopy Research Facility.

Yusuf Menda, MD

Dr. Yusuf Menda was born and raised in Istanbul, Turkey. He attended Medical School at the University of Istanbul. He completed his residency training in Nuclear Medicine at The University of Iowa in 2000. He finished a fellowship in PET imaging before joining the faculty in July 2001.

Anjali Singh, MD

Dr. Anjali Singh joined the abdominal imaging section after completing a body imaging fellowship at The University of Iowa. She finished her radiology residency at Cook County Hospital, Chicago and internship from Loyola University in Chicago. She looks forward to teaching medical students and residents.

Mark Stanley, MD

Dr. Mark Stanley, Associate Professor, joined the musculoskeletal section after working as Assistant Professor for the Uniformed Services University of Health Sciences and as a body imager at the Naval Medical Center in San Diego, CA. Previously, Dr. Stanley served as Assistant Chairman for the Department of Radiology and Head of the Diagnostic Radiology Division at the Naval Medical Center.

Timothy Tewson, PhD

Dr. Timothy Tewson joined the PET imaging group at The University of Iowa after working in Seattle and Houston as a PET chemist developing new radio-pharmaceuticals. His goal is to implement a program of developing new imaging agents for use with PET. The primary thrust of this program will be towards Oncology but will extend to the cardiac and nervous systems.
Honors and Awards

Monzer Abu-Yousef, MD
— Appointed to be Examiner for the American Board of Radiology, held in Louisville, Kentucky, in June 2001.

Michael D’Alessandro, MD
— Won the Department of the Navy Award for Knowledge Sharing - Outstanding Knowledge Expert System in 2000 for his digital library research project, the Virtual Naval Hospital.

Edmund Franken, Jr., MD

Georges El-Khoury, MD
— Appointed to be Examiner for the American Board of Radiology, held in Louisville, Kentucky, in June 2001.

John Haller, PhD

Richard Hichwa, PhD
— Asked to serve an additional two years on the NIH Diagnostic Imaging Study Section, through June 2003.

Simon Kao, MD
— Appointed to be Chairman of the Scientific Program Committee in Pediatric Radiology, Radiological Society of North America from 2001-2003.

Joan Maley, MD
— Selected to join the University Teaching Scholars Program.

Brian Mullan, MD
— Elected to the Executive Committee of the College of Medicine.

Laura Ponto, PhD
— Assumed office as Member-At-Large for the Section on Nuclear Pharmacy of the American Pharmaceutical Association (APhA) in March 2001, for a two-year term.
— Served in 2000 as the acting chairman of the Medical Imaging Drugs Advisory Committee (MIDAC) of the FDA. Appointed in 2001 as the Chairman of MIDAC. Currently serving as a consultant to MIDAC.
— Appointed as a member of the 2000-2005 United States Pharmacopeia (USP), Council of Experts, Information Division, Committee on Radiopharmaceuticals.

Axel Ruprecht, DDS
— Elected to become a Fellow of the American College of Dentists (FACD), effective in October 2001.
— Awarded Instructor of the Year by the junior class of the College of Dentistry for the year 2000-2001.

Yutaka Sato, MD
— Appointed to be Examiner for the American Board of Radiology, held in Louisville, Kentucky, in June 2001.

Bone Subtraction and Automated Central Path Finding

In addition to the 3D rendering of MRI and CT images that is widely available, two new tools have recently been added to the arsenal of medical image processing – bone subtraction and automated central path finding. Subtracting bones from CT angiograms, for example, can be used to better visualize blood vessels in the head or elsewhere in the body. The central path finding algorithm enables radiologists to the measure the length and diameter of the abdominal aorta, as well as aneurysms along the path of the aorta. For more information about these new image processing technologies, contact John Haller or Mary Burr in the Laboratory for Imaging Applications at (319) 384-8095.
Yearly Departmental Awards

Teaching Awards

Faculty Teacher of the Year
Joan Maley, MD

Resident Teacher of the Year
Michelle Kraut, MD

Special Award for Teaching
Alan Stolpen, MD, PhD
Brian Mullan, MD

Gillies Outstanding Medical Student
Ryan Holthaus

Medical Student Program
Teaching Awards

Teacher of the Year
Joan Maley, MD

Outstanding Lecturer
Bruce Brown, MD

Outstanding Small Group Instructor
Michael D’Alessandro, MD

Resident Teacher of the Year
Kamran Janjua, MD

Outstanding Resident Teacher
Bill Hession, MD
Jody Bolton-Smith, MD

Employee of the Year

James Olson
Chris Ward

Retirements

James Ehrhardt, MD
Dinah Cassabaum

Service Awards

5 years:
Kelly Blowers -- Radiation Oncology
Lottie Brenneman -- Radiation Oncology
Robert Brumm -- Diagnostic Radiology
Russell Johnson -- Diagnostic Radiology
Timothy Smith -- Diagnostic Radiology
Steven Hoffman -- Radiology Engineering

10 years:
Heather Birely -- Diagnostic Radiology
Stacey Sharp -- Transportation Aid
Marianne Klouda -- Diagnostic Radiology
Steve Rummelhart -- Film Room
Jill Schultz -- Nuclear Medicine
Nicole Louvar -- Administration

15 years:
Susan Curtis -- Diagnostic Radiology
Troy Frei -- Radiology Engineering
Pamela Jones -- Radiation Oncology
Dawne Kiefer -- Diagnostic Radiology
Edward Pennington -- Radiation Oncology
Joseph Schebler -- Radiology Engineering
Jeff Snell -- Nuclear Medicine

20 years
Joan Kabela -- Diagnostic Radiology
Mark Nicklaus -- Diagnostic Radiology
Anne Reisen -- Diagnostic Radiology

25 years
Debbie McCracken -- Diagnostic Radiology