

Pettigrew Takes Helm at NIBIB



Also Inside:

- Spiral CT Monitors Spread of Ovarian Cancer
- Virtual Colonoscopy Viable Screening Tool for Polyps
- Physician Shortage Predicted in All Specialties
- Proposed Patient Consent Rule Questioned
- RSNA Adds Online CME Repository to Membership Benefits

Enrollment Opens June 24 for
Refresher Courses at RSNA 2002

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RSNA News

The newsletter of the Radiological Society of North America

June 2002 • Volume 12, Number 6

Published monthly by the Radiological Society of North America, Inc., at 820 Jorie Blvd., Oak Brook, IL 60523-2251. Printed in the USA.

Periodical postage pending mailing with postage in Oak Brook, IL 60523, and additional mailing offices. POSTMASTER: Send address correction "changes" to: *RSNA News*, 820 Jorie Blvd., Oak Brook, IL 60523-2251.

Nonmember subscription rate is \$20 per year; \$10 of active members' dues is allocated to a subscription of *RSNA News*.

Send articles, letters and comments to:
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Oak Brook, IL 60523

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Two RSNA Grant Recipients Earn Awards from NIH

Jeffrey R. Petrella, M.D., a neuroradiologist at Duke University Medical Center in Durham, N.C., has been awarded a \$1.8 million NIH grant for his project, “fMRI Studies in Early Alzheimer’s Disease.”

Dr. Petrella credits the RSNA Research and Education Foundation with helping him to prepare for the NIH grant process. “I took advantage of all the RSNA R&E Foundation had to offer. The

seed grant and scholar awards were instrumental in giving me time and funding to acquire preliminary data for the grant. The Advanced Grant Writing course, along with an experienced mentor, helped guide and pace me through the grant writing process.”

Stephen M. Hahn, M.D., from the University of Pennsylvania Hospital’s Department of Oncology in Philadelphia, has received funding for two NIH grants: “Phase I Trial of PDT in



Jeffrey R. Petrella, M.D.



Stephen M. Hahn, M.D.

M.D., is the principal investigator of the overall program project.

“Interestingly enough, this project was the one that I worked on during the RSNA Grant Writing course,” says Dr. Hahn. “I thank the

RSNA and course instructor, **Liane Reif-Lehrer, Ph.D.**, for the opportunity to learn so much about the grant writing process.”

Patients with Prostate Carcinoma” and “Tumor Hypoxia, Photosensitizer, Vascular-ity and PDT Response.”

For the second grant, Dr. Hahn is the principal investi-gator, while **Eli Glatstein,**

RSNA and course instructor, **Liane Reif-Lehrer, Ph.D.**, for the opportunity to learn so much about the grant writing process.”

Two Honors for Wall

Susan D. Wall, M.D., was inaugu-rated in April as the new president of the Society for Gastrointestinal Radiologists (SGR). She succeeds 2001 SGR President **William W. Olmsted, M.D.**, RSNA’s education editor and editor of *RadioGraphics*. Dr. Wall is also the recipient of the 2002 Alumnus of the Year Award from the University of California, San Francisco, where she is the associate dean for Graduate Medical Education and vice-chairman of the Radiology Department. Dr. Wall is also the chairman of the *RSNA News* Editorial Board.



Susan D. Wall, M.D.

Cea New President of NY State Medical Society

Radiologist **Ann C. Cea, M.D.**, has been elected president of the Medical Society of the State of New York. She is the first female president in the Society’s 196-year history. Dr. Cea has a private practice in Rye Brook, N.Y., is a radio-therapy consultant on the staff of United Hospital Medical Centers in Port Chester, and is a staff member of Lawrence Hospital Medical Center in Bronxville.



Ann C. Cea, M.D.

Levine Wins Distinguished Teaching Award

Marc S. Levine, M.D., professor of gastrointestinal radiology at the University of Pennsylvania, is the recipient of a 2002 Lind-back Award for Distin-guished Teaching. The win-ners of the university’s prestigious award are deter-mined by nominations and recommendations made by faculty and students.

In Memoriam: Robert G. Fraser, M.D.

1990 RSNA Gold Medalist **Robert G. Fraser, M.D.**, died on April 12 at the age of 80. Dr. Fraser was a professor emeritus at the University of Birmingham and co-author of the world-renowned *Fraser and Pare’s Diagnosis of Dis-eases of the Chest*. He was also the co-founder of the Fleischner Society, an interna-tional interdisciplinary society dedicated to studies of the chest.

Erratum:

A photo in the May issue of *RSNA News* was incorrectly inserted in an area announcing an award for James H. Scatliff, M.D. The photo is of Carl M. Sandler, M.D.

RSNA News

Send your submissions for *People in the News* to rsnanews@rsna.org, (630) 571-7837 fax, or *RSNA News*, 820 Jorie Blvd., Oak Brook, IL 60523. Please include your full name and telephone number. You may also include a non-returnable color photo, 3x5 or larger, or electronic photo in high-resolution (300 dpi or higher) TIFF or JPEG format (not embedded in a document). *RSNA News* maintains the right to accept information for print based on membership status, newsworthiness and available print space.

Distinguished Honorees and Lecturers at the 88th Scientific Assembly and Annual Meeting

GOLD MEDALISTS

Michael S. Huckman, M.D.,
Chicago, Ill.
Stanley S. Siegelman, M.D.,
Baltimore, Md.
Michael A. Sullivan, M.D.,
New Orleans, La.

HONORARY MEMBERS

Philippe A. Grenier, M.D.,
Paris, France
Yuji Itai, M.D.,
Ibaraki, Japan
Henry Wagner, M.D.,
Baltimore, Md.

SPECIAL PRESIDENTIAL AWARD

Chicago Mayor
Richard M. Daley

EUGENE P. PENDERGRASS NEW HORIZONS LECTURE

Functional Brain Imaging
Bruce R. Rosen, M.D., Ph.D.,
Charlestown, Mass.

ANNUAL ORATION IN DIAGNOSTIC RADIOLOGY

*Screening Mammography:
Controversies and Headlines*
Valerie P. Jackson, M.D.,
Indianapolis, Ind.

ANNUAL ORATION IN RADIATION ONCOLOGY

*Linking Radiation Oncology
and Imaging Through
Molecular Biology*
C. Norman Coleman, M.D.,
Bethesda, Md.



More detailed information about each of these honorees and presenters will be available in future editions of *RSNA News*. See page 23 for meeting registration information.

NIBIB Awards First Research Grants

The National Institute of Biomedical Imaging and Bioengineering (NIBIB) has awarded its first research grants.

■ **Yale University School of Medicine** in New Haven, Ct., will receive \$1.4 million as part of the NIH Bioengineering Research Partner-

ship program. The project's lead investigator, James S. Duncan, Ph.D., is developing magnetic resonance functional and spectroscopic imaging techniques to study and treat neocortical epilepsy. The grant is co-sponsored by the National Institute of Neurological Disorders and Stroke.



■ **The University of California at San Francisco Cardiovascular Research Institute** will receive a competing renewal research grant of \$330,000 for a project, headed by Alan S. Verkman, M.D., Ph.D., which will develop new optical methods for imaging cellular architecture and dynamics.

■ **Tribofilm Research, Inc.**, of Raleigh, N.C., will receive a small business innovation research award of \$420,000. This project, headed by Dr. Paul M. Vernon, will develop new silicone-free, low-friction coatings for syringes.

Status of Abstracts

The RSNA Program Committee met June 7 at RSNA Headquarters in Oak Brook, Ill., to work on the scientific sessions for RSNA 2002. More than 7,400 abstracts were received for consideration. Last year, those accepted included:

- 1,670 scientific papers
- 478 scientific posters
- 1,100 education exhibits (120 *infoRAD* exhibits)

Letters will be sent in mid-June to notify individuals about the status of their submitted abstracts for education exhibits. Letters will be mailed in mid-July for scientific papers and poster presentations.

RadiologyInfo™ Honored

The RSNA-ACR joint patient information Web site, *RadiologyInfo.org*, has been named to the 2002 Associations Advance America (AAA) Honor Roll.

The AAA Awards from the American Society of Association Executives recognize associations and industry partners that advance American society with innovative programs in education, skills training, standard setting, business and social innovation, knowledge creation, citizenship and community service.



SCVIR Name Change

The Society of Cardiovascular and Interventional Radiology will now be known as the Society of Interventional Radiology (SIR). The name change is being accompanied by a new Society logo which includes the tag line, "Enhanced care through advanced technology."

"The Society has spent the past year formulating a strategic plan and there was consensus that a name change and stronger identity was important if we are to continue making progress in educating other physicians and the public about the scope and breadth of interventional radiology," said SIR President Michael Darcy, M.D.



Fusion Imaging—The New Horizon

The RSNA Associated Sciences Consortium is sponsoring three symposia during the 88th Scientific Assembly and Annual Meeting. The theme for this year's program will be *Associated Sciences: Fusion Imaging—The New Horizon*.

The symposia will be held from 10:30 a.m.–12:00 p.m.

MONDAY, DECEMBER 2

Image Fusion: Techniques, Technology and Applications for Oncologic Patients from a Medical Physics Perspective, presented by Charles Pelizzari, Ph.D., and Jeffrey T. Yap, Ph.D.

TUESDAY, DECEMBER 3

Fusion Imaging: An Introduction to Its Clinical Uses and the Education Challenges It Presents, presented by Robert E. Henkin, M.D., and Betty G. Wilson, Med, R.T.(R)(CT), R.D.M.S.

WEDNESDAY, DECEMBER 4

Fusion Imaging and Issues of Reimbursement, presented by Frances Keech, M.B.A., R.T.(N).

The Associated Sciences program also includes a series of eight refresher courses:

- *Workforce Crisis: Strategies for Management*
- *Digital Technology for Diagnostic Imaging*
- *Transforming the Organization: eCommerce and Its Influence on the Modern Radiology Facility*
- *Continuity of Care*
- *HIPAA and Radiology: The Operational Impact*
- *The Digital Department: Its Architecture and Design*
- *How to Effectively Manage the Capital Asset Cycle: From Acquisition Planning to Maintenance and Replacement Strategies*
- *The Process of Managing Outcomes*

The Associated Sciences Consortium is a working group comprising 11 professional associations representing the various disciplines that function within the radiology department. It includes: American Healthcare Radiology Administrators (AHRA), American Institute of Architects—Academy of Architecture for Health (AIA—AAH), American Radiological Nurses Association (ARNA), American Society of Radiologic Technologists (ASRT), Association of Educators in Radiological Sciences, Inc. (AERS), Association of Vascular and Interventional Radiographers (AVIR), Canadian Association of Medical Radiation Technologists (CAMRT), Radiology Business Management Association (RBMA), Section for Magnetic Resonance Technologists (SMRT-ISMRM), Society for Radiation Oncology Administrators (SROA), and Society of Nuclear Medicine—Technologists Section (SNM—TS)

Dear Editors:

In the lead article in your March 2002 issue of *RSNA News*, “Coronary MR Imaging May Replace Angiography in Some Cases,” which summarizes the December 27, 2001 *New England Journal of Medicine (NEJM)* study, “Coronary Magnetic Resonance Angiography for the Detection of Coronary Stenosis,” there are incorrect statements and quotations which undercut the intent and conclusions.

The *NEJM* study's coauthor, Warren J. Manning, is quoted as saying “Patients with dilated coronary arteries in the absence of a clinical history of infarction are the first to benefit from this research.” The coronary MRA research in which he participated has nothing to do with dilated coronary arteries.

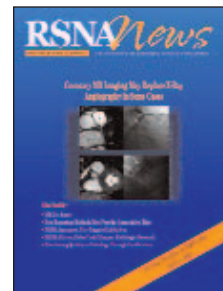
Newsletter abstracts of scientific research should strive to make the material digestible and relevant without confusing or exaggerating the authors' claims. Usually, *RSNA News* does just that, but with the *NEJM* paper on coronary MRA, *RSNA News* has not met these standards.

Robert S. Feld, M.D.
Section of Interventional Radiology
St. Francis Hospital and Medical Center
Hartford, Ct.

In response:

What the article should have said was “Patients with a dilated cardiomyopathy in the absence of...” With respect to our *NEJM* article, it makes no sense to say dilated coronary arteries; however, in a more recent *Circulation* article, we demonstrate coronary MRA to be valuable for dilated coronary arteries as well.

Warren J. Manning, M.D.



RSNA News

Send your *Letters to the Editor* to rsnanews@rsna.org, (630)

571-7837 fax, or *RSNA News*, 820 Jorie Blvd., Oak Brook, IL 60523. Please include your full name and telephone number. *RSNA News* maintains the right to accept information for print based on membership status, newsworthiness and available print space.

Pettigrew Takes Helm at NIBIB

One of the “Best Doctors in America” will be the first director of the National Institute of Biomedical Imaging and Bioengineering (NIBIB) at the National Institutes of Health (NIH).

Roderic I. Pettigrew, M.D., Ph.D., a member of the RSNA Research Development Committee, is a professor of radiology and a professor of medicine (cardiology) at Emory University in Atlanta. He is also the director of the Emory Center for MR Research.

In accepting the appointment, Dr. Pettigrew said:

I am honored and privileged to be joining the NIH at this important moment when the opportunity to develop new technologies in medicine has never been greater. To combat disease more effectively, the hope is to develop new and emerging technologies that can detect the disease process at its earliest stage, when therapies are most efficacious. I and the NIBIB staff look forward to working with the other NIH institutes and centers, the research community, and the public to achieve this vision. Working together, we can increase the understanding of how advances in biomedical imaging and bioengineering can be applied to improve public health. We will use the technological advances and this knowledge to help conquer disease.

C. Douglas Maynard, M.D., a member of the NIBIB director search committee, is extremely happy Dr. Pettigrew has accepted the position. “He is a superb choice for director of NIBIB. He is a well recognized clinical

scientist who can easily gain support of both the imaging as well as the bioengineering communities,” says Dr. Maynard, an RSNA past president.

RSNA’s current president agrees, “NIBIB is lucky to get a director of the caliber of Dr. Pettigrew, who has been a very creative investigator and leader in cardiovascular imaging,” says R. Nick Bryan, M.D., Ph.D., Eugene P. Pendergrass Professor and chairman of the Department of Radiology at the University of Pennsylvania. “Dr. Pettigrew has the scientific insight to direct future basic as well as translational imaging research. In addition, Rod’s experience in the NIH system provides him an important administrative background.”

Dr. Pettigrew is expected to begin his appointment in late August or early September.

Less than two years ago, the institute was still a dream.

Today, NIBIB provides unique and unlimited opportunities for medical imaging scientists, teachers, students, practitioners and multidisciplinary specialists. “The establishment of NIBIB and the selection of our colleague Dr. Roderic Pettigrew as its first director constitute a ‘once in a lifetime’ opportunity and responsibility for all of us in radiology,” says C. Leon Partain, M.D., Ph.D., chairman of

RSNA’s Research Development Committee. “This special circumstance is further enhanced by the recent Presidential appointment and Senate confirmation on May 2, 2002, of another colleague, Dr. Elias Zerhouni, as the

Director of NIH,” adds Dr. Partain, Carol D. and Henry P. Pendergrass Professor of Radiology, Radiological Sciences and Biomedical Engineering at Vanderbilt University Medical Center in Nashville.

Dr. Pettigrew’s appointment is good news for the Academy of Radiology Research (ARR), the group that led the lobbying effort for the new Institute.

“The appointment of a permanent director of NIBIB is an important step for the new Institute,” say ARR Executive Director Edward C. Nagy. “It will allow NIBIB to move forward to complete its staff and to develop a full research program.”

Donna J. Dean, Ph.D., acting director of NIBIB, says NIBIB is moving forward in the next phase of its growth and evolution, “Our efforts in creating NIBIB’s initial vision and operations will be continued with Dr. Pettigrew’s unbounded enthusiasm and exemplary leadership. We are happy that the search process for our permanent director has resulted in such an accomplished individual to propel NIBIB and NIH into uncharted and critical frontiers of research endeavor.” She adds that she and Dr. Pettigrew will be working closely together to ensure a smooth transition.



Roderic I. Pettigrew, M.D., Ph.D.
NIBIB Director



President Bush authorized a budget of \$112 million in new money for NIBIB for fiscal year 2002. This is in addition to the \$67 million in research grants that have already been transferred and other grants that are expected to be transferred. In April, NIBIB awarded its first three grants (see page 2).

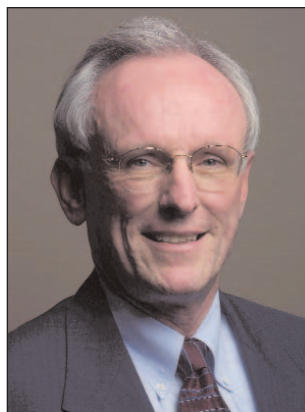
Nagy says Dr. Pettigrew's formal training in bioengineering and imaging, as well as his expertise and experience as chairman of the Diagnostic Radiology Study Section at the NIH Center for Scientific Review, will make him an excellent spokesperson for imaging science and an outstanding director of NIBIB. "He brings unique qualifications in both imaging and biomedical engineering to the Institute," says Nagy. "He has also earned respect as a successful investigator and brings valuable experience as a former chair of the study section. I am confident that members of both the imaging and biomedical engineering communities will be well-pleased with Dr. Pettigrew's leadership at NIBIB."

Dr. Pettigrew sparked the interest of the medical community at a very early age. He went straight from the 11th grade in Albany, Georgia, to Morehouse College on a full scholarship from Charles Merrill (of Merrill Lynch). He later studied at Columbia University in New York in an intensified summer physics program and at the University of Vienna in Austria.

Dr. Pettigrew received an M.S. degree in nuclear science and engineering from Rensselaer Polytechnic Insti-



R. Nick Bryan, M.D., Ph.D.
RSNA President



C. Leon Partain, M.D., Ph.D.
Chair, RSNA Research Development Committee

tute in New York, his Ph.D. degree in applied radiation physics from the Massachusetts Institute of Technology, and his M.D. degree from the University of Miami Medical School in an accelerated program for individuals who already hold a Ph.D. degree.

While at Emory, he and colleagues developed a way to interactively view and manipulate, in three-dimensional space, "slices" of a patient's "beating" heart. Using a special MR imaging-based system, heart surgeons are now able to glimpse views of the heart they cannot see

even in the operating room. Dr. Pettigrew is the author of the book *MRI of the Cardiovascular System*.

Dr. Pettigrew has been named annually to "The Best Doctors in America" list since the program's inception in 1992. The list is compiled by a group called Best Doctors through an evaluation of leading specialists around the world. These specialists identify the physicians they would choose for treatment. Only about four percent of all U.S. physicians are selected as outstanding.

The establishment of NIBIB and the selection of our colleague Dr. Roderic Pettigrew as its first director constitute a "once in a lifetime" opportunity and responsibility for all of us in radiology.

—C. Leon Partain, M.D., Ph.D.

Challenges Ahead

Dr. Partain says there are three major challenges that must be addressed in order to assure success for NIBIB and its new director. The first is integrating NIBIB into NIH as a valuable, welcomed, collaborating and communicating partner in trans-NIH and trans-agency programs and initiatives.

The second is the need for broad-based and significantly increased financial support for the disciplines of radiology and medical imaging by practition-

ers in the field, in order to assure that the discipline survives and thrives. "This is essential because our colleagues in other subspecialties stand ready and willing to adopt imaging modalities that are exciting, high-tech based and profitable if we do not continue to develop the field, train the practitioners and provide excellence in image-related services," says Dr. Partain. "Adequate support from NIH is also an important component of the required broad-based financial support."

The third challenge Dr. Partain identifies is the recruitment of bright young people into a career of medical imaging research. "At many institutions there is a long history of success in recruiting the brightest medical school graduates into their diagnostic radiology residency program," he says. "They score very, very well on in-service written and oral ABR examinations. They are accepted at leading fellowship programs and most take private practice positions. Exceptional physicians/investigators (about one out of 20) will be well trained in science and research and become academic radiologists. The field needs to help us realign incentives to encourage and enable a larger fraction of our brightest young trainees to enter a research career in academic radiology and medical imaging." □



An expanded version of this story is available at rsnanews.org

Spiral CT Monitors Spread of Ovarian Cancer

Spiral, or helical, CT is not only faster than conventional CT, but it has also improved the detection of ovarian cancer spread into the abdominal cavity, according to a study in the May issue of *Radiology* (*Radiology* 2002; 223:495-499).

The study, conducted at Memorial Sloan-Kettering Cancer Center in New York, examined the accuracy of spiral CT in the detection of peritoneal metastases using surgical findings in patients with ovarian cancer as the standard of reference.

Francisco. "And then we looked at the results of surgery to determine how accurate we actually were."

The results were encouraging. The authors report a sensitivity of 85 percent to 93 percent for the detection of peritoneal metastases by spiral CT, in contrast to previously reported values of 63 percent to 79 percent using conventional CT.

"Those are quite good numbers," comments Caroline Reinhold, M.D., from the Department of Diagnostic Radiology at Montreal General Hospital,

a radiologist who was not involved in the study. "In my own experience with helical CT, I can see, on a routine basis, small peritoneal metastases that we were never able to see before. So these numbers would certainly go along with my experience."

The study found that sensitivity was

reduced for peritoneal metastases measuring one centimeter or less in diameter. "For the subgroup of metastases that were equal to or less than one centimeter, sensitivity fell to about 25 to 50 percent," Dr. Reinhold says. "So, for the very small ones, we're still doing poorly."

She calls the results "very opti-

mistic news" nonetheless. "It is primarily the ones that are greater than one centimeter that change patient management," she says.

"I think the impact is really for patients who have newly diagnosed ovarian cancer," says Dr. Coakley. "It would suggest that staging of the cancer by spiral CT is highly accurate and can be used as a reliable adjunct to surgical planning."

Since nearly all ovarian cancer patients will have surgery, Dr. Coakley believes the study results will be significant for surgeons. "To the operating physician, the ability of CT to detect these lesions with high accuracy is going to give him greater confidence in terms of planning the surgery and knowing how extensive the surgery will be," he says. "There is a greater degree of comfort in knowing that we are, in fact, highly accurate in detecting the spread of disease within the abdomen."

What do the findings mean for radiologists? "This study shows that investment in the latest technology, such as spiral CT, results not only in improved patient throughput, but also improves our ability to detect small disease within the abdomen—specifically, small cancer deposits in the peritoneal cavity," says study co-author Hedvig Hricak, M.D., Ph.D., chairman of the Department of Radiology at Memorial Sloan-Kettering.

Looking to the Future

Imaging, the CA-125 blood test and exploratory surgery are all among the components for diagnosis of ovarian cancer. A diagnostic laparotomy removes cysts and other suspicious



Fergus V. Coakley, M.D.
Radiology Department
University of California, San Francisco



Hedvig Hricak, M.D., Ph.D.
Chair, Radiology Department
Memorial Sloan-Kettering Cancer Center

"We looked back at 64 patients who had had spiral CT scans before surgery. And we looked at the CT studies in a blinded fashion, with three different radiologists interpreting the studies," says lead author Fergus V. Coakley, M.D., now chief of abdominal imaging in the Department of Radiology at the University of California, San



Transverse preoperative contrast-enhanced CT scan obtained in 50-year-old woman with mixed endometrioid and mucinous adenocarcinoma of the ovary shows apparent nodularity (arrows) in the paracolic gutters. All readers interpreted these findings as highly suggestive of peritoneal metastases, but no tumor implants were found at surgery. The pathologic basis of the CT appearance in this case is unknown.

Radiology 2002; 223:495-499

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material for biopsy. Treatment includes surgical debulking to remove as much of the cancerous tissue as possible. Chemotherapy and sometimes radiation follow surgery in most ovarian cancer cases.

But for some patients, their disease is in locations not appropriate for surgery. Those patients appear to do better by having their chemotherapy before surgery. “I think the next step is seeing if we can identify those patients using spiral CT to select that subgroup of patients who would be better off getting chemotherapy before, rather than after, surgery,” says Dr. Coakley.

Dr. Reinhold suggests that spiral CT may also play a role in the treatment of patients who, in the past, may have undergone a second-look laparotomy to determine if they needed more or different chemotherapy. “We know that second-look laparotomies—even though they were considered the gold standard—were problematic, because when the surgeons would tell us that there was no residual disease, 50 percent of

I think the impact is really for patients who have newly diagnosed ovarian cancer. It would suggest that staging of their cancer by CT is highly accurate and can be used as a reliable adjunct to surgical planning.

— Fergus V. Coakley, M.D.

these patients had recurrences anyhow,” she says. “This would indicate that residual disease was missed, or simply, this was just not a good predictor of patient outcome. Because second-look laparotomy has proven not to be very useful, it is no longer recommended on a routine basis.”

Dr. Coakley believes spiral CT is still underutilized in the area of ovarian and other types of gynecologic cancer, and he hopes this study will help expand its use for

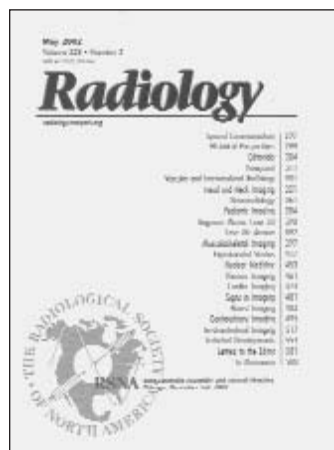
these types of examinations.

“I think for radiologists, it’s important that we educate our clinicians as to the accuracy of spiral CT,” he urges.

Ovarian Cancer in the U.S.

Ovarian cancer accounts for nearly four percent of all cancers among women in the United States and ranks second among gynecologic cancers, following cancer of the uterine corpus. The American Cancer Society (www.cancer.org), in its *Estimated New Cancer Cases and Deaths By Gender, U.S., 2002*, projects that 23,300 women will develop ovarian cancer this year, about the same number estimated for 2001. An estimated 13,900 deaths from ovarian cancer are projected for 2002.

If ovarian cancer is diagnosed and treated while localized, the five-year survival rate is 95 percent. But only about 26 percent of all ovarian cancer cases are detected at the localized stage. The five-year relative survival rate for all stages is 52 percent. □



The full text of Dr. Coakley's study is available at radiology.rsna.org

Virtual Colonoscopy Viable Screening Tool for Polyps

CT colonography (CTC), an experiment in virtual imaging only a few short years ago, is now a bona fide diagnostic tool in the fight against colon cancer. A number of published studies in average and high-risk patients have demonstrated the procedure's ability to detect polyps without the risks and discomfort often associated with endoscopic colonoscopy. Research shows CTC to be more sensitive than barium enema at detecting large and medium-sized polyps. Some radiologists even believe it already matches colonoscopy in detecting polyps larger than one centimeter.

Also known as virtual colonoscopy, CTC uses thin-section helical CT to generate high-resolution 2-D axial images of the entire colon, as well as 2-D multiplanar images and 3-D endoluminal images that simulate the perspective at endoscopy. It's considered safe and is generally well tolerated. However, some researchers say that until there are published data from screening population studies, CTC should be restricted to symptomatic patients, patients who cannot undergo conventional colonoscopy and those who absolutely refuse colonoscopy.

"This test is not as good as colonoscopy, but there are still a lot of patients who have either incomplete colonoscopies or they can't be taken off blood thinners or receive sedation," says C. Daniel Johnson, M.D., a professor of radiology at the Mayo Medical School in Rochester, Minn. "All of those people would be really good candidates for CT colonography."

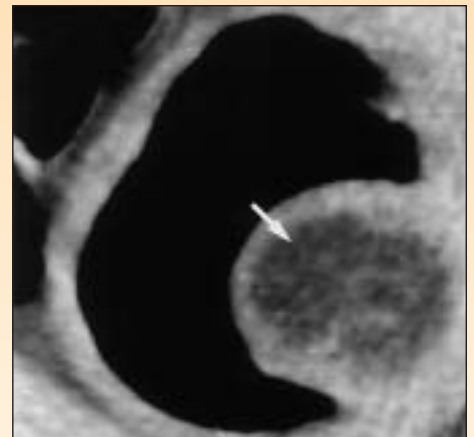
He adds that since colonoscopy is the best test available to detect polyps, physicians should not dissuade their patients from having it in preference to CTC. "But there is going to be a percentage of patients who are not willing to have a colonoscopy, and for those patients, I think CT colonography is the answer."

Dr. Johnson's own research suggests that CT colonography can hold its own against most colorectal screening

yet a colonoscopy substitute."

Dr. Johnson doubts that CTC will ever be as specific and sensitive as colonoscopy since it is the current gold standard, but his view is not shared by many of his colleagues who gathered in Boston this April for the Third International Symposium on Virtual Colonoscopy, chaired by Joseph T. Ferrucci, M.D., chairman of radiology at Boston University Medical Center.

"There was optimism and the feel-



CT colonographic images show colonic lipoma, colonoscopically proved. (left) Three-dimensional endoluminal image shows a nearly obstructing intraluminal mass (arrows). The surface characteristics of the mass are not helpful for characterization. (right) The fat internal attenuation (arrow) of a lipoma is visible on the 2D reformation image (Reprinted, with permission, from *RadioGraphics* 1997;17:1157-1167.) A lipoma has homogeneous fat attenuation and is best evaluated by using soft-tissue window settings.

(*Radiology* 2000;216:331-334) Reprinted with permission.

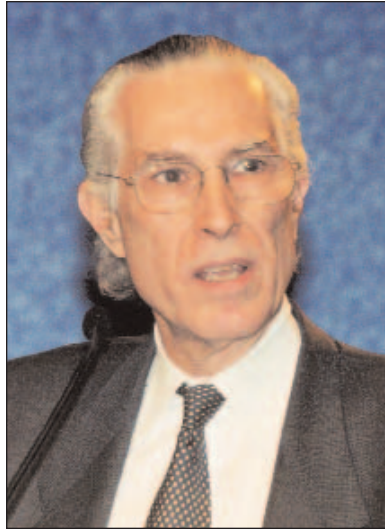
methods. He was the principal investigator in an American College of Radiology Imaging Network Study, a multicenter trial of CTC showing that the procedure detects about 80 percent of polyps one centimeter or larger. Dr. Johnson says he'll soon report results of the first large study in a screening population, "CT colonography looks good compared with fecal occult blood and flexible sigmoidoscopy, but it's not

ing was that while virtual colonoscopy is not yet ready for prime time as a widespread clinical tool, it's knocking at the door," says Dr. Ferrucci. "There's a great deal of momentum. We need more data on screening populations where the prevalence of polyps is low. If there's a low prevalence of disease, you don't want to be having a lot of false positives."

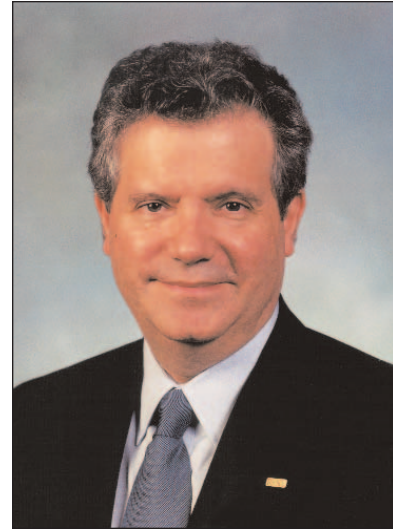
Dr. Ferrucci says data from around



C. Daniel Johnson, M.D.
Radiology Department
Mayo Medical School



Joseph T. Ferrucci, M.D.
Chairman, Radiology Department
Boston University Medical College



Pablo R. Ros, M.D., M.P.H.
Executive Vice-Chairman
Radiology Department
Brigham & Women's Hospital

the world show that VC's sensitivity for polyps greater than a centimeter surpasses 90 percent, which is considerably better than the Mayo results. With smaller polyps, sensitivity drops to 75 or 80 percent.

For example, a study by Andrea Laghi, M.D., and colleagues at the University of Rome shows that CTC can detect polyps measuring one centimeter or larger with a sensitivity of 92 percent, and six- to nine-millimeter polyps with a sensitivity of 82 percent. The prospective study, published in the February *American Journal of Surgery*, included 165 patients with suspected colorectal lesions.

Colonography researcher Helen M. Fenlon, M.B.B.Ch., of Mater Misericordia Hospital in Dublin, agrees that multislice CT provides the sensitivity to pick up significant polyps, but she believes the cutoff for "significance" should be five millimeters, not 10.

"Lots of people might agree that one centimeter is a reasonable target size, but personally I think if we pick five millimeters we can't be criticized," says Dr. Fenlon, a 1997 RSNA Research Fellow.

"In our research, we find that many polyps five millimeters or smaller are

normal colonic mucosa, they're not even hyperplastic. If you go after these tiny polyps, your specificity will decrease because you'll overcall lesions and subject people with normal colons to unnecessary colonoscopy."

Dr. Fenlon agrees that CTC is now the second-best test for colorectal cancer. "I believe it is a much better test than barium enema, and I don't say this with any degree of pleasure because I don't like to see us damaging a radiological technique. But I think virtual colonoscopy should probably replace the barium enema for symptomatic patients, particularly elderly patients for whom it's a much easier test."

Unfortunately, the primary problem in the U.S. is compliance, not technological sophistication. At present, only about 40 percent of eligible patients undergo screening for colon cancer with either fecal occult blood testing, flexible sigmoidoscopy, barium enema or colonoscopy. For colonoscopy, the most effective of the group, the figure is much lower. "Even if you have a test that finds only half the polyps," says

Dr. Johnson, "if the test is highly acceptable to patients and a high percentage is screened, from a population standpoint, you're going to have a much bigger impact on reducing the mortality from the disease than if you have a perfect test that addresses only 10 percent of the population."

While virtual colonoscopy is not yet ready for prime time as a widespread clinical tool, it's knocking at the door.

— Joseph T. Ferrucci, M.D.

Indeed, virtual colonoscopy as it is currently used may not significantly increase compliance—at least not right away. Studies looking at patient response and acceptance of the procedure show mixed results. A study at the UCSF Veterans

Affairs Medical Center by Judy Yee, M.D., which was published last year, found that patients tolerate both virtual and conventional colonoscopy, although they report more pain and discomfort undergoing virtual colonoscopy. The researchers conclude, "efforts to improve patient experience during virtual colonoscopy need to be investigated." The authors say the poor showing of virtual colonoscopy may have been

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partially due to the fact that patients were not sedated during air insufflation for CTC, whereas they did receive sedative and analgesic drugs during colonoscopy. Reporting a different experience, researchers at Mayo surveying 1,313 patients found that CTC is highly preferred by patients over colonoscopy.

Various centers are working on ways to reduce hurdles to more effective colonography. Chief among patient complaints is the rigorous 24-hour preparation of liquid diet and harsh laxatives, says Pablo R. Ros, M.D., M.P.H., executive vice-chairman of the Department of Radiology at Brigham & Women's Hospital and professor of radiology at Harvard Medical School in Boston.

"One of the techniques that is being proposed is to give small amounts of contrast material 24 or 48 hours before the test. That contrast enhances the fecal material so you can electronically subtract it from the colon," says Dr. Ros. However, the use of contrast media increases the cost and makes the procedure more invasive. "There also are computer-aided diagnoses and a technique called 'colon flattening'

that's tantamount to doing electronically what is done by the pathologist."

At the National Institutes of Health, researchers led by radiologist Ronald M. Summers, M.D., Ph.D., are working on computer software that will help radiologists find polyps and allow them to analyze the data more rapidly, which may lead to lower cost to the patient and higher accuracy.

"The software is still experimental," says Dr. Summers, who studied 20 patients at high risk for colon cancer. "What we've found is that we can detect about two-thirds of clinically significant polyps one centimeter or larger using computer software alone—with a low false-positive rate—and that this evidence is supportive of the concept that a computer algorithm could help radiologists interpret the CT colonography studies."

Another issue is radiation risk to a screening population. This is a major concern in Europe, where CT tube output doses must be below two millisieverts. Dr. Laghi and her colleagues in Rome are looking at very low-dose CTC that would make large-scale screening less risky.

Adds Dr. Ros, "We still need research to help us make sure we iden-

tify all the polyps that are potential malignancies—those more than five or seven millimeters. This must be evaluated in thousands, not hundreds, of cases. And we have to identify the flat lesions that are not polyps but little raised cancers that can be difficult to detect. And we have to ask are we saving lives and what are we bringing to the table regarding quality of life and survival to patients undergoing CT colonography?"

Dr. Summers adds: "Since professional organizations have not yet advocated CT colonography as a replacement for conventional colonoscopy, as a researcher I would be reluctant to say that I thought patients could use CT colonography to the exclusion of colonoscopy at this time. I think the ball is in our court to publish studies that convince the medical community that CT colonography is the way to go. That may happen in the next few years." □

Late News:

At the American Society for Gastrointestinal Endoscopy meeting, May 19-23, in San Francisco, preliminary data from a new study were reported suggesting that virtual colonoscopy is inadequate for the correct detection of colonic polyps of 6 mm in size or greater.

Peter B. Cotton, M.D., director of the Digestive

Disease Center at the Medical University of South Carolina in Charleston, and colleagues conducted the study at nine centers in the United States.

Dr. Cotton tells *RSNA News*, "After analysis of 580 cases, the sensitivity of virtual colonoscopy for correctly identifying subjects with at least one polyp

6 mm or greater in size was 40 percent. For polyps 10 mm or greater in size, correct detection was 44 percent. There was considerable variation between Centers in the results."

Dr. Cotton concluded that, "These results did not negate the obvious potential for virtual colonoscopy (as evidenced by other single

center studies), but that improved training and techniques are necessary before the method could be considered for widespread use"

The study, "Comparison of Virtual Colonoscopy and Colonoscopy in the Detection of Polyps/Masses," appears in *Gastrointestinal Endoscopy* 2002;55:AB98.

Physician Shortage Predicted in All Specialties

Radiologists are well aware of the shortage of candidates seeking faculty positions in academic radiology programs. Now comes a report of a shortage of all physicians by the year 2020.

A study in the January/February *Health Affairs* says unless the pace of medical education changes, there will be a deficit of 200,000 physicians by 2020. The study counters earlier research predicting a 15- to 30-percent surplus of specialty physicians by the year 2000.

Study co-author Richard "Buz" Cooper, M.D., is the director of the Health Policy Institute at the Medical College of Wisconsin in Milwaukee and a national expert on the physician workforce. His research looks at the economy, population growth, age, ethnic mix, demand for healthcare and the increasing role of non-physician healthcare providers.

To stem the tide of an overall physician shortage, Dr. Cooper recommends medical schools increase their output 35 percent by 2020. This recommendation is similar to one made by RSNA Past President C. Douglas Maynard, M.D., and E. Stephen Amis Jr., M.D., who co-chair the American College of Radiology's (ACR) Task Force on Human Resources. Dr. Maynard says while a number of medical school programs have increased residency slots in the last couple of years, it is not enough to fill all the vacancies in academic radiology.

One way to increase radiology training slots is through legislation. The Harkin-Snowe bill (S. 548) to authorize more funding for mammography

includes a provision for Medicare to pay for three additional radiology slots at each of the radiology residency programs in the United States. There were 193 residency programs for diagnostic radiology for the academic year that ended in June. The additional slots would be provided only if there is enough staff for a one-to-one staff-to-resident ratio and enough volume for 7,000 exams per year per resident. However, this legislation has been sitting on the back burner for some time now. Dr. Amis says, "While this measure is very important to radiology, it is not at the top of the national agenda."

A second and very controversial way to increase slots is to reduce the length of the training program for diagnostic radiology from four years to three. The ACR Task Force on Human Resources rejected this recommendation last year. However, with no legislative support in sight, Dr. Maynard says, "It may be the only way to get those slots."

Shortage of Radiology Faculty

Dr. Maynard says he plans to re-survey the heads of the 124 academic radiology

programs in the United States before July. A similar survey in 2001 showed nearly 600 job openings for radiology faculty. Dr. Maynard predicts the 2002 survey will show even more vacancies.

The shortage is very real for Dr. Amis. He has been advertising for four



C. Douglas Maynard, M.D.
Co-chair, ACR Task Force on Human Resources



E. Stephen Amis Jr., M.D.
Co-chair, ACR Task Force on Human Resources

new radiologists out of a staff of 50. "Three of the positions are expansion slots to help us keep up with current demand," he says.

At RSNA 2002, December 1–6 in Chicago, Drs. Amis and Maynard will host a special focus session, "The Radiologist Shortage: Will It Continue?" Other panelists include Jonathan H. Sunshine, Ph.D., senior director for research at ACR, a representative from the Centers for Medicare and Medicaid Services (formerly called the Health Care Financing Administration) and a member of the Graduate Medical

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Education Board. Drs. Amis and Maynard will provide an update of the work of their task force. They'll also discuss ACR research predicting a workload increase for all radiologists as well as funding issues and the cap on the number of radiology residents. A question and answer session will follow. Dr. Amis says he welcomes all suggestions on other topics for discussion or potential solutions to the shortage. His e-mail address is amis@aecom.yu.edu.

The Match

Each year, the National Resident Matching Program (NRMP) conducts a "match"—the primary system that matches applicants to residency programs with available positions at U.S. teaching hospitals. There were 23,459 active applicants in the 2002 match, including 14,336 U.S. medical school seniors.

NRMP reports interest in certain medical specialties, including diagnostic radiology, anesthesiology and physical medicine and rehabilitation, appears to be on the rise with more matches in each specialty. The 2002 match also shows a decrease in applicants matched to generalist positions such as family practice, pediatrics and internal medicine.

For post-graduate year one (PGY-1) positions, diagnostic radiology offered 132 positions; 125 (94.7 percent) were filled. Radiation oncology offered 14 positions; all were filled.

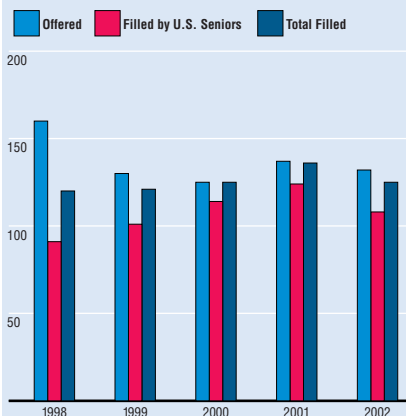
Post-graduate year two (PGY-2) programs begin after a year of prerequisite training. Diagnostic radiology offered 788 positions; 776 (98.5 percent) were filled. The filled slots represent 44 more than the slots filled in advanced programs last year. For radiation oncology, 83 positions were offered; 81 (97.6 percent) were filled.

Overall, 20,670 positions (90.2 percent) were filled out of 22,916 positions available. That compares to 89 percent each year since 1999.

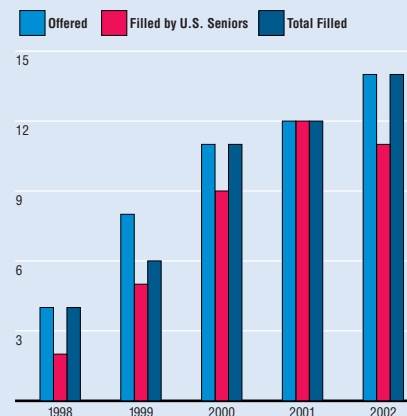
Positions offered and filled from 1998 through 2002

POST-GRADUATE YEAR 1

Diagnostic Radiology

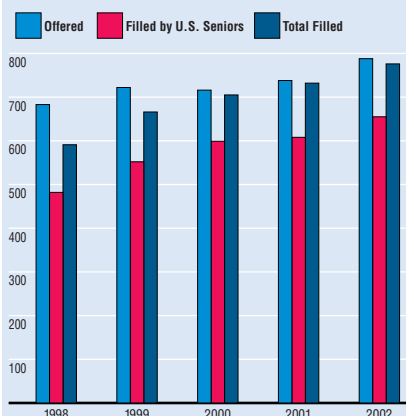


Radiation Oncology



POST-GRADUATE YEAR 2

Diagnostic Radiology



Radiation Oncology



Source: National Resident Matching Program 2002 Match Data

Cream of the Crop

Both Drs. Amis and Maynard agree with department chairs around the nation that the incoming radiology residency class is the most promising in years. Dr. Maynard says this is expected to be the most exceptional class since the mid-90s when an apparent hiring freeze discouraged many of the most promising students.

Dr. Amis says the incoming class is the top end with many schools inter-

viewing only honors students. "Radiology is a hot specialty right now, in part because of the need for radiologists. These incoming residents know they will be able to control their lifestyle in terms of hours and location. It's high tech, and there is no end in sight in terms of developing additional technologies. As for the economics, radiologists are near the top of all specialties for average reimbursement with six to 20 percent growth annually," he says. □

Special Focus Session at RSNA 2002

On Monday, December 2, 4:00 – 5:30 p.m., Drs. Maynard and Amis will moderate a special focus session at RSNA 2002 titled, "The Radiologist Shortage: Will It Continue?" For more information on how to register for RSNA 2002, see page 23.

Proposed Patient Consent Rule Questioned

The Department of Health and Human Services (HHS) has proposed changes to privacy standards under the Health Insurance Portability and Accountability Act (HIPAA), but not everyone agrees the changes are a good idea—especially the proposed removal of the patient consent requirement.

The initial Standards for Privacy of Individually Identifiable Health Information, known as the Privacy Rule, took effect April 14, 2001. The Privacy Rule creates national standards to protect individuals' personal health information and gives patients increased access to their medical records. It affects the use of personal medical records for treatment, research, marketing, reimbursement and other purposes.

The rule covers health plans, healthcare clearinghouses and healthcare providers who conduct financial and administrative transactions electronically. Most covered entities must comply with the Privacy Rule by April 14, 2003. Small health plans have until April 14, 2004 to comply.

Consent Requirement

The changes proposed by HHS in March would remove a requirement that patients consent to having a healthcare provider or entity use or disclose their protected health information for treatment purposes. "The department received comments that the consent requirements in the current rule interfere with pharmacists filling prescriptions, referrals to specialists and hospitals, providing treatment over the phone and emergency medical providers," an HHS statement says.

The proposed modifications strengthen the requirement that

providers notify patients of their privacy rights and the specific privacy practices of the provider but remove the patient consent requirement. HHS believes that requiring patients to sign a formal privacy consent form before receiving treatment could potentially interfere with efficient and effective healthcare. With the change, patients would be asked merely to acknowledge having received a notice of privacy rights and practices, but physicians and other providers could treat the patients even if they did not sign a consent form.

However, the change applies only to uses of medical records for treatment, payment and healthcare operations that could interfere with healthcare delivery. "For example," the statement notes, "patients could be required to visit a pharmacy in person to sign paperwork before a pharmacist could fill their prescriptions. Similar barriers could arise when a patient is referred to a specialist and in other situations. In addition, doctors could refuse to treat patients who refused to sign their privacy consent form."

The American Medical Association (AMA) questions the wisdom of the proposed change. Asserting the long-held value in medicine that patient privacy is fundamental to the patient-physician relationship, a statement from AMA Secretary-Treasurer Donald

J. Palmisano, M.D., J.D., says, "The AMA is concerned that the [Bush] administration has proposed removing the patient consent requirement instead of modifying it to make it more workable. If the final privacy rule will be

issued without a consent provision, the AMA urges the administration to strictly limit the activities for which patient information could be used without consent."

De-identification

Dr. Palmisano is concerned that the revised rule does not adequately protect patient privacy. "Patient privacy will not be fully protected until Congress passes

legislation that extends privacy requirements to all entities that use medical information, including employers, marketers, life insurers and others," he says. "Right now, patient information can be used without consent for a wide range of business activities, including underwriting, and there is no incentive to de-identify patient records. De-identified medical information should be used whenever possible to best protect patient privacy."

De-identification of patient information, as defined in the original HIPAA Privacy Rule, is the process of removing the patient's name, access number and other identifying information from all records. Under the



Donald J. Palmisano, M.D., J.D.
Secretary-Treasurer
American Medical Association

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original rule, de-identifying a record requires the removal of 18 data elements, including names, addresses, such biometric information as fingerprints and voiceprints, Social Security and health plan numbers, full-face photographs and any other number or data that may serve to identify a patient.

Forms for Research

For radiologic researchers, one important aspect of the proposed changes is the modification to eliminate the need for researchers to use multiple consent forms. Under the current Privacy Rule, patients must give written authorization for the use of their medical records for clinical trials and other medical research in addition to signing the standard consent forms for research. Under the proposed revisions of the Privacy Rule, researchers could use a single combined form to obtain patients' consent to the research itself and the use of their medical records. This change would apply equally to both publicly and privately funded research.

In addition, HHS received comments from the research community on the need for an alternative approach to de-identification. As a result, HHS sought comments on establishing a limited data set of patient information that does not include information that can directly identify the patient but does contain certain identifiers. However, before healthcare providers or other covered entities could release this limited data set, they must obtain an agreement from researchers or other users of the data that the data will be used only for the purposes it was given, such as research. The user would also be

required to agree not to re-identify the information or use it to contact the patient.

Marketing Materials

Another proposed change to the Privacy Rule relates to sending marketing materials to individual patients. Consumers who responded to HHS' call for comments on the Privacy Rule expressed a concern that the marketing provisions in the rule do not protect individual privacy when it comes to receiving marketing materials from healthcare providers and other covered entities. In response to these concerns, HHS proposes that covered entities

Under the proposed revisions of the Privacy Rule, researchers could use a single combined form to obtain patients' consent to the research itself and the use of their medical records.

must first obtain an individual patient's specific authorization before sending any marketing materials. However, this proposal would not prevent physicians, health plans and hospitals from communicating freely with patients about treatment options and providing other health-related information, including information on disease-management programs.

"We are pleased to see stronger restrictions on how health information can be used for marketing and that only the minimum amount of information necessary should be disclosed," says Dr. Palmisano. The minimum amount of information necessary refers to the "minimum necessary" provision of the original Privacy Rule that requires covered entities to make reasonable efforts to limit the disclosure of patients' protected health information to the minimum necessary to accomplish an

intended purpose, such as clinical research.

The term "protected health information" describes personal medical information related to a patient's physical or mental health in any form—oral, paper or electronic. The proposed changes to the rule would retain the minimum necessary provision, but make clear that physicians could discuss a patient's care with other physicians and healthcare professionals involved in the patient's care without violating the Privacy Rule, even if the physicians are overheard.

Business Associates

Dr. Palmisano has concerns about another provision of the Privacy Rule, "The [Bush] administration did not eliminate the business associates provisions, which place significant burdens on physicians to be responsible for the actions of their business associates." The original Privacy Rule requires providers, health plans and healthcare clearinghouses to draw up contracts with their business associates specifying that the business associates have policies in place to protect the privacy of patient information. "These provisions increase the administrative burden for physicians—the one sector of the healthcare system already ethically bound to safeguard patient privacy," Dr. Palmisano says.

All interested organizations or individuals were given 30 days to comment on the proposed modifications to the Privacy Rule. HHS then reviews the comments and will make a final determination on whether to adopt the rule changes. Any revisions to the Privacy Rule would become effective October 13 this year. □

Physicians, clinics and most other healthcare entities can request a one-year extension to comply with the standards and code sets for electronic data transactions under HIPAA. The deadline for seeking an extension is October 15, 2002. The HIPAA Model Compliance Extension Form is available at www.cms.gov/hipaa/hipaa2/.

The American College of Radiology has established a "HIPAA Update" section on its Web site, www.acr.org.

RSNA Adds Online CME Repository to Membership Benefits

RSNA members have a new tool to help them keep track of their continuing medical education credits—an online CME Credit Repository (www.rsna.org/cme).

“It is a useful mechanism to document all of a physician’s CME credits in one convenient location,” says William W. Olmsted, M.D., RSNA education editor and editor of *RadioGraphics*.

Originally designed in 2000 for CME credits earned through Interact-ED, RSNA instituted the more-inclusive program a few weeks ago to assist physicians in keeping records of all of their CME credits for compliance with maintenance of certification (MOC) standards.

CME credits earned through RSNA-related activities since the 1999 Scientific Assembly and Annual Meeting have already been stored in the repository. Members may view existing credits and may input CME credits earned through non-RSNA-related activities.

“Members are able to view and print a certificate of all of their category 1 and category 2 CME credits stored in the CME Credit Repository,” says Dr. Olmsted. “These printed certificates may be used as the proof necessary for relicensure or for hospital privileges.”

The printable cumulative record of RSNA-earned credits includes the RSNA Accreditation Statement and a signature by RSNA Secretary-Treasurer

David H. Hussey, M.D.

The American Medical Association’s Physicians Recognition Award (PRA) requires that physicians participate in at least 50 hours a year of educational activities that meet AMA standards to earn the PRA (www.ama-assn.org/ama/pub/category/2922.html). The PRA category 1 credit system has become the CME standard for licensing boards and specialty organizations nationwide. At RSNA 2002, physicians can earn up to 80.5 hours of category 1 CME credit.

Initially, the RSNA CME repository stored credits earned only through the RSNA Education Center and Interact-ED, but Dr. Olmsted says his ultimate intent was to expand the scope of the repository. “The Society wanted to make it as easy as possible for mem-

bers to keep track of all of their CME credits for maintenance of certification requirements,” he says.

The concept of MOC will eventually replace time-limited recertification in all medical

specialties. The blueprint established by the American Board of Medical Specialty Societies calls for demonstration of lifelong learning and self-assessment (see the March issue of *RSNA News*).



William W. Olmsted, M.D.
RSNA Education Editor
Editor, *RadioGraphics*.

“Having the ability to document the education credits that one earns will be crucially important. I envision all RSNA members using the CME Credit Repository for this purpose,” says Dr. Olmsted. □

Editor’s Note.—For more technical information on the CME Credit Repository, see page 24.

RSNA’s CME Credit Repository

RSNA members can log into the CME repository at www.rsna.org/cme.

- Enter membership number and password (last name)
- Click on “Your Profile” to change password
- View all recorded CME credits by date and/or activity
- Print signed certificate of CME credits

Internet for You – Part 5

Multimedia on the Internet

Multimedia refers to any computer-based presentation or application that integrates two or more of the following elements: text, graphics, animation, audio, video and virtual reality. A PowerPoint presentation combining text, graphics and video clips is an example of a multimedia application. It is a noninteractive multimedia presentation in which the slides are displayed in a predefined linear fashion. Interactive multimedia applications accept input from the user by means of a keyboard, voice or mouse and perform an action in response. An interactive multimedia program allows users to select the material, define the order in which it is presented and obtain feedback on their actions. The ability for users to interact with a multimedia application is one of its more unique and important features that enhances learning by engaging and challenging users.

Text is a fundamental element used to convey information. It can be enhanced by a variety of textual effects to emphasize and clarify information, e.g., font size, color, style or special effects, such as shadow, blinking, bouncing or fading.

A **graphic** is a digital representation of non-text information, such as a drawing, charts or photographs. Graphics were the first media used to enhance the text-based Internet. The introduction of graphical Web browsers allowed Web page developers to incorporate illustrations, logos and pictorial navigation into Web pages. Graphics files on the Web must be saved in a certain format. The two most common file formats for graphical files are **JPEG** (Joint Photographic Experts Group) and **GIF** (Graphics Interchange

Format). Files are saved in both JPEG and GIF format using compression techniques to reduce the file size for faster downloading from the Web.

JPEG is designed for compressing full-color, grayscale images or continuous-tone artwork. Any smooth variation in color, such as occurring in highlighted or shaded areas, will be represented more faithfully and in less space by JPEG than by GIF. GIF does significantly better on images with only a few distinct colors, such as line drawings and simple cartoons. Plain black-and-white images should never be converted to JPEG. There has to be at least 16 gray levels before JPEG is useful for gray-scale images.

JPEG is *lossy*, meaning that the decompressed image isn't quite the same as the original. A *lossless* compression algorithm is one that guarantees its decompressed output to be bit-for-bit identical to the original input. This scheme does not discard any data during the encoding process, while the lossy scheme throws useless data away during encoding. That is, in fact, how lossy schemes manage to obtain superior compression ratios over most lossless schemes. JPEG was designed specifically to discard information that the human eye cannot easily see. Because the human eye is much more sensitive to brightness variations in gray-scale than to color variations,

JPEG can compress color data more heavily than brightness data. Grayscale images do not compress well by large factors. It should be noted that GIF is lossless for gray-scale images of up to 256 levels, while JPEG is not. However, the more complex and

subtly rendered the image, the more likely that JPEG will do well.

There are two good reasons for using JPEG: to make image files smaller and to store 24 bits/pixel color. Using smaller image files makes it easier to transmit files across networks and saves storage space when creating archiving libraries. JPEG stores full color information 24 bits/pixel (16 mil-



Katarzyna J. Macura, M.D., Ph.D.
The Russell H. Morgan Department of Radiology and Radiological Science
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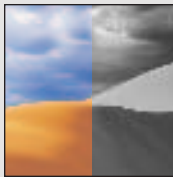

lion colors) unlike GIF, which can store only 8 bits/pixel (256 or fewer colors). Hence JPEG is considerably more appropriate than GIF for use as a WWW standard photo format. However, it takes longer to decode and view a JPEG image than to view an image of a simpler format such as GIF. A useful property of JPEG is that adjusting compression parameters can vary the degree of lossiness. This means that the image maker can trade file size against output image quality.

JPEG is a useful format for compact storage and transmission of images, but it should not be used as an intermediate format for sequences of

image manipulation steps. The disadvantage of lossy compression with JPEG is that if the user repeatedly compresses and decompresses an image, a little more quality is lost each time. A lossless 24-bit format such as PNG (Portable Network Graphics), TIFF (Tagged Image File Format) or PPM (Portable PixMap) should be used while working on the original image and then JPEG format can be used when the file is ready to store or send out on the net. If the user expects to edit the image again in the future, the original lossless master copy should be used. Both GIF and PNG support transparent backgrounds, while JPEG does not have this ability. This issue is currently making the GIF image very popular with Web page creators and designers.

Because graphics files can be time consuming to download, some Web sites use *thumbnails* on their pages. A thumbnail is a small version of a larger image that the user can click on to display the full-sized image. The graphical elements for computer applications can be obtained from a clip art/image gallery, which is a collection of previously created clip art and photographs grouped by themes. Graphics can also be created using paint/image editing software, for example, Windows Paint, PaintShop Pro or Adobe Photoshop. Photographs for multimedia applications can be obtained using a scanner to digitize photos, taking the photographs with a digital camera or buying them in a photograph collection on a CD-ROM. Graphics can also be downloaded from the Web.

Displaying a series of still graphics in rapid sequence creates an **animation**, which is a graphic that has the illusion of motion. Animated graphics make Web pages more visually attractive and draw attention to important information or links. There are graphics animation and authoring software packages that allow creation of animations. One popular type of animation, called an animated GIF, is created using spe-

<p>JPEG (Joint Photographic Experts Group)</p>		<ul style="list-style-type: none"> ■ Designed for compressing full-color, gray-scale images or continuous-tone artwork. ■ Requires at least 16 gray levels for gray-scale images. ■ Can store full color information 24 bits/pixel (16 million colors) ■ Lossy
<p>GIF (Graphics Interchange Format)</p>		<ul style="list-style-type: none"> ■ Designed for compressing images with only a few distinct colors, such as line drawings and simple cartoons. ■ Can store only 8 bits/pixel (256 or fewer colors) ■ Lossless for gray-scale images of up to 256 levels

cial software (e.g., Ulead GIF Animator freeware) to combine several images into a single GIF file. With GIF Animator the user can create pictures, banners, buttons and even movies using the built-in image editor or any stand-alone graphics editor, to create image files that will be assembled into GIF animation. Also, the user can obtain previously created animations from a CD-ROM or download them from the Web.

Audio is music, speech or any other sound. Using audio in a multimedia application to supplement text and graphics enhances understanding. Audio for multimedia can be obtained in several ways. One method is to capture the sound using a microphone, CD-ROM, radio, musical device or any other audio input device that is plugged into a port on a sound card. As with graphics and animation, audio clips can be purchased on a CD-ROM, DVD-ROM or downloaded from the Web. Audio files can be quite large, and therefore they are frequently compressed to reduce the size and increase the speed of downloading. MP3 is a popular technology to compress audio. Files compressed using this format have an extension of .mp3 and have to be downloaded completely. Most currently used browsers contain a program called a **player** that can play the audio in MP3 files. Web applications also use streaming audio that allows the user to listen to the sound as it downloads to the computer. **Streaming** is the process of transferring data in a continuous and

even flow, which allows users to access and use a file before it has been transmitted completely. Streaming is important because most users do not have fast enough Internet connections to download a large multimedia file quickly. Web-based audio can be also used for Internet telephone service, sometimes called Internet telephony. This technology allows users to talk to other people over the Internet. Internet telephony uses the Internet, instead of a telephone network, so the cost of the communication is reduced to the cost of the Internet connection. Internet telephone software and the computer's sound card digitize and compress the conversation and then transmit the digitized audio over the Internet to the called parties.

Video consists of photographic images that are played back at speeds of 15-30 frames per second and provide the appearance of full motion. To use video in a multimedia application, the developer has to capture, digitize and edit the video segments using special video production hardware and software. Video can also be captured directly in digital format using a digital video camera. Due to the size of video files, incorporating video into a multimedia application is often a challenge. Files require large amounts of storage space, therefore they are often compressed. Video compression works by recognizing that only a small portion of the video image changes from frame to frame, and after storing the first refer-

Continued on next page

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ence frame only changes from one frame to the next are stored. The Motion Pictures Experts Group has defined a standard for video and audio compression and de-compression, called **MPEG**. MPEG compression can reduce the size of video files up to 95 percent, while retaining near TV quality. Video compression has allowed

video to play a more important role in multimedia applications. Technologies such as streaming video made video a viable part of multimedia on the Web. As with streaming audio, streaming video allows the

user to view longer or live video images as they are downloaded to the computer. The standard used for transmitting video data on the Internet is RealVideo, which is a component of RealPlayer supported by most current Web browsers. Streaming video also allows conducting Internet videoconferences that work like Internet telephony. A video camera, videoconferencing software and video capture card digitize and compress the images and sounds. After they are sent over the Internet, equipment and software at the receiving end assemble and decompress the data presenting the images and sound as video. The Synchronized Multimedia Integration Language (SMIL, pronounced "smile") enables simple authoring of interactive audiovisual presentations. SMIL is typically

used for "rich media/multimedia" presentations, which integrate streaming audio and video with other media type. SMIL is an HTML-like language and many SMIL presentations are written using a simple text-editor.

Another important application of multimedia is to create **simulations**, which are computer-based models of real-life situations. Multimedia simula-

The ability for users to interact with a multimedia application is one of its more unique and important features that enhances learning by engaging and challenging users.

tions often replace costly and sometimes dangerous demonstrations and training, such as in chemistry, nuclear physics, aviation and medicine. Also, multimedia simulations are used in the game industry. **Virtual**

reality is the simulation of a real or imagined environment that appears as a three-dimensional (3-D) synthetic space that has dynamic properties specified by software. On the Web, virtual reality involves the display of 3-D images that the user can explore and manipulate interactively. Most Web-based virtual reality applications are developed using virtual reality modeling language (VRML), which is a language that describes the geometry of the scene. Using VRML, a developer can create an entire 3-D site, called a virtual reality world containing infinite space and depth. Virtual reality has many practical applications in science, education, advertising, design and other fields.

Some of the multimedia on the Web is developed in **Java**, which is a programming language specifically designed for use on the Internet. Developers use Java to create stand-alone applications or programs called **applets** that can be downloaded and run in the window of any Java-enabled browser. An applet is a short program executed inside of another program that runs on the user's computer.

Most Internet browsers have the capability of displaying basic multimedia elements on a Web page. Sometimes the browser needs an additional program called a plug-in or helper application, which extends the capability of the browser. A **plug-in** runs multimedia elements within the browser window, while a **helper application** runs multimedia elements in a window separate from the browser. Plug-ins and helper applications can be downloaded or copied at no charge from many sites on the Web. Usually, Web pages that use multimedia include links to Web sites that contain the required plug-in or helper. Some browsers include commonly used plug-ins, such as Shockwave. To view the virtual world, the user needs a VRML browser or a VRML plug-in to a Web browser.

Combining media for Web applications brings Web pages to life, increasing the types of information available on the Web, expanding the Web's potential uses and making the Internet a more entertaining place to explore. □

Editor's Note— The original Mini-Tutorial on the Internet by Katarzyna J. Macura, M.D., Ph.D., was published in the AAWR Newsletter Focus. Dr. Macura is updating her series for RSNA News.

AAWR
www.aawr.org

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RSNA Link

www.rsna.org

Radiology Online

radiology.rsnaajnl.org

Radiology Manuscript Central

radiology.manuscriptcentral.com

RadioGraphics Online

radiographics.rsnaajnl.org

Education Portal

www.rsna.org/education/etoc.html

CME Credit Repository

www.rsna.org/cme

RSNA Index to Imaging Literature

rsnaindex.rsnaajnl.org

RadiologyInfo™

ACR-RSNA public information Web site
www.radiologyinfo.org

RSNA Online Products and Services

www.rsna.org/member/services

2001 RSNA Annual Report

www.rsna.org/about/annualreport.html

RSNA 2002 Exhibitor Prospectus

www.rsna.org/rsna/te/prospectus/

Advance Registration for RSNA 2002

www.rsna.org/rsna/advanceregistration/

Radiology in Public Focus

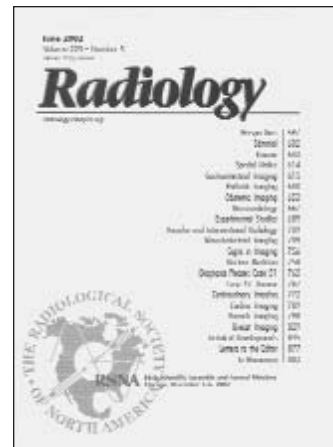
A press release has been sent to the medical media about the following scientific article that appears in the June issue of *Radiology* (radiology.rsnaajnl.org).

“Image-guided Primary Bone Tumor Biopsies: Experience with 110 Primary Tumors” Percutaneous needle biopsy, guided by either CT or fluoroscopy, appears to be an accurate and safe alternative to surgical biopsy in patients with a bone tumor. James S. Jelinek, M.D., from the Washington Hospital Center in Washington, D.C., and colleagues found that image-guided biopsy provided a high

degree of diagnostic accuracy—88 percent for histologic diagnosis and 98 percent for benign vs. malignant—in the 110 patients studied.

The authors write: “This study and others demonstrate that in carefully controlled situations in which the musculoskeletal radiologist works in a team approach with the orthopedic oncologist and orthopedic pathologist, the results of percutaneous biopsies can be extremely effective and accurate.”

(*Radiology* 2002; 223:731-737)



REGISTER JUNE 24 FOR THE ESSENTIALS OF RADIOLOGY

Enrollment begins June 24 for refresher courses at RSNA 2002. This year, a new course series is available in a compact, two-day session. The *Essentials of Radiology* is designed for general radiologists, residents and subspecialists who want to review other areas of radiology.



TUESDAY, DECEMBER 3

Essentials of Trauma CT

Head Trauma

R. Gil Gonzalez, M.D., Ph.D.

Spine Trauma

Diego B. Nunez Jr., M.D.

Chest Trauma

Stuart E. Mirvis, M.D.

Abdominal Trauma

Robert A. Novelline, M.D.

Essentials of Chest Radiology

Caroline Chiles, M.D.

Reginald F. Munden, D.M.D., M.D.

Robert D. Tarver, M.D.

Essentials of Shoulder Imaging

Mark J. Kransdorf, M.D.

Arthur A. DeSmet, M.D.

Michael J. Tuite, M.D.

Essentials of Pediatric Imaging

Practical Imaging Issues in Respiratory Diseases in Children

Lane F. Donnelly, M.D.

Unique Fractures of Childhood

Tal Laor, M.D.

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Carlos J. Sivit, M.D.

Common Pediatric Abdominal Masses

Randall R. Richardson, M.D.

This series provides up to 12 hours of category 1 CME credit.

Look for your *Advance Registration Brochure* in the mail or register on the Internet at www.rsna.org/rsna/advanceregistration.

For more information or to order a brochure, call (630) 571-7862 or e-mail reginfo@rsna.org.

WEDNESDAY, DECEMBER 4

Essentials of Ultrasound Imaging

Matthew D. Rifkin, M.D.

Harris L. Cohen, M.D.

Edward I. Bluth, M.D.

Essentials of Uroradiology

David S. Hartman, M.D.

Peter L. Choyke, M.D.

Raymond B. Dyer, M.D.

Ronald J. Zagoria, M.D.

Essentials of Breast Imaging

Ellen B. Mendelson, M.D.

Stephen A. Feig, M.D.

Essentials of Liver Imaging

Pablo R. Ros, M.D.

Valerie Vilgrain, M.D.

Koenraad J. Mortele, M.D.

Bresolin Faces New Opportunity with Excitement, Optimism



RSNA's new assistant executive director for research and education believes these are very exciting times for radiology—especially in the area of research. Because of that, Linda B. Bresolin, Ph.D., M.B.A., is energized by her new role with the RSNA Research and Education Foundation.

After nearly 16 years with the American Medical Association working in a broad spectrum of positions including vice-president of Professional Standards, Policy and Advocacy, director of the Office of Women's and Minority Health, and senior scientist in the Division of Health Science, Dr. Bresolin joined RSNA in January and was immediately invigorated by the challenge.

"It was and is very appealing to me to be able to work for an organization whose primary mission is science and education," she says. "RSNA enjoys a reputation for excellence and effectiveness within organized medicine. The Foundation's work to identify and fund innovation by young radiologists, whether through doing research or developing educational programs to advance radiology, is particularly rewarding."

The chairman of the RSNA Research and Education Foundation Board of Trustees, Michael A. Sullivan, M.D., is confident Dr. Bresolin will enhance the visibility and impact of the Foundation, "Her vast experience and knowledge will help to further grow and develop this very important part of RSNA. I am very pleased she's decided to come on board."

Dr. Bresolin earned her Ph.D. in clinical psychology at Loyola University of Chicago and maintains the position of assistant professor in the

Department of Psychiatry and Behavioral Sciences at Northwestern University Medical School. She is the author of more than 30 book chapters and publications or presentations in peer-reviewed scientific venues and understands the importance of research and education.

"Like all of medicine, the future of radiology depends on the education, training and creativity of young radiologists," says Dr. Bresolin. "Radiology is a medical discipline in which technology and practices are changing rapidly and dramatically. The Foundation research grants are aimed at supporting radiologists in training and young faculty members as they launch a career in radiology research."

This year, the Foundation will launch two new fellowship programs—one in informatics and one in basic science. Dr. Bresolin believes that these and other grants from the Foundation are stepping stones to bigger and better things for up-and-coming radiology leaders. "The two new fellowships ensure that there are radiologic researchers who are able to rapidly translate advances in these two related disciplines into the clinical practice of radiology."

The grants come with a requirement to participate in RSNA's courses on grant writing. This training has

already helped many young researchers apply for and receive federal funding. (See page 1.)

Exciting Research Possibilities

Radiology is increasing its prominence in the national spotlight. The imaging sciences are not only celebrating the

historic opening of the National Institute of Biomedical Imaging and Bioengineering (NIBIB) and the appointment of Roderic I. Pettigrew, M.D., Ph.D., as director (see page 4), but also the unanimous confirmation of internationally respected radiologist, Elias A. Zerhouni, M.D., as director of the National Institutes of Health (NIH).

"Obviously, a radiologist heading the NIH is exciting

for all radiologists," says Dr. Bresolin. "What it means is that there is a leader at NIH with a clear understanding of the nature and importance of radiology research. The NIBIB will provide a forum for imaging research that takes advantage of multidisciplinary expertise. What we hope is that the NIBIB will be supported by additional dollars for imaging research and not simply through projects and dollars diverted from the extremely worthy research programs of other NIH institutes."

Impact of 9/11 on the Foundation

The weakened economy and the terrorist attacks on the United States have



Linda B. Bresolin, Ph.D., M.B.A.
RSNA Assistant Executive Director for Research and Education

taken a toll on fundraising efforts of all kinds. The Foundation has also been affected. "Like all other organizations and individuals, the Foundation's net worth diminished considerably over the past 18 months," says Dr. Bresolin. "The amount we have available to award as grants is based on a "payline"—a percentage of investment earnings over the previous 12 quarters. As a result of the economic downturn, the amount we will be able to award this year is less than it has been in each of the past two years."

In 2001, the Foundation awarded \$2.5 million in grants. The projection for 2002 is \$1.7 million.

"We fund the grant applications that are rated highest by our study sections. This means that a solid grant application that might have received funding last year may not be funded this year," says Dr. Bresolin. "We are optimistic, however, that our payline will return to a higher level as RSNA members, corporate colleagues and friends continue to make donations to the Foundation and as the economy rebounds."

Funding Radiology's Future

Late last year, RSNA developed a new program to help provide incentive and recognition to those who regularly contribute to the Foundation. Membership in the RSNA President's Circle program requires a commitment by individual Society members to contribute at least \$1,500 per year for at least 10 years.

This year, the Foundation adopted the slogan "Funding Radiology's

Future" as a way to motivate members to donate to the cause. "We hope that the use of this phrase in association with the Foundation's name will remind us all of the essential mission of the Foundation and its relevance to radiology practitioners everywhere," says Dr. Bresolin.

She adds that investing in research is ultimately investing in the future of radiology. "Whether or not they are personally engaged in conducting research or educating radiologists, radiologists should see the Foundation as

an important venue through which they can invest in emerging technologies that will shape their practices in years to come, not to mention contributing to the future of radiology generally."

Currently, only about 10 percent of RSNA members make an annual donation of any size to the RSNA R&E Foundation. "We would like to dramatically increase the rate of annual giving," says Dr. Bresolin, adding that she plans to improve the Foundation's information systems this year to better evaluate the existing programs and to improve communication with RSNA members about what the Foundation is doing. Through increased communication, she believes more of RSNA's 32,000 member radiologists, radiation oncologists and physicists will realize the importance of research and education to their own practice. In addition, the Foundation has hired Deborah Kroll as its first Managing Director for Fund Development.

For more information on the RSNA Research and Education Foundation grant programs, contact Scott Walter at (630) 571-7816 or walter@rsna.org.

For more information about donating to the Foundation, contact Deborah Kroll at (630) 368-3742 or dkroll@rsna.org. □

Like all of medicine, the future of radiology depends on the education, training and creativity of young radiologists.

—Linda B. Bresolin, Ph.D., M.B.A.

RESEARCH AND EDUCATION: OUR FUTURE



Research and Education Foundation Donors

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PROGRAM AND GRANT ANNOUNCEMENTS

NEW

Nominations Due June 15 for RSNA Outstanding Researcher and Outstanding Educator Awards

The RSNA Outstanding Researcher and Outstanding Educator Awards recognize individuals who have made significant contributions to the radiological sciences throughout a career of research or education. The deadline for nominations is June 15. Nomination forms can be downloaded from the RSNA Web site (www.rsna.org) by selecting "R&E Foundation", "Current Foundation Activities" and then "Grant Application Forms." Please contact Scott Walter, Manager, Grant Review Process at (630) 571-7816 or walter@rsna.org for additional information.

NEW

\$150M DoD Breast Cancer Funding Opportunities

The Department of Defense (DoD) Breast Cancer Research Program (BCRP) has released more information on its funding opportunities. Details on each funding mechanism are available at cdmrp.army.mil/funding/02bcrp2.htm. They include Innovator Awards, which can include a wide range of scientists beyond biolife scientists; Physician-Scientist Awards, for those looking for a way to pay back their loans for medical school and get their research training funded; and Clinical Research Nurse Training Awards, which are intended to support nurses at all levels focusing on breast cancer research in an interdisciplinary breast cancer research environment.

22nd International Congress of Radiology

RSNA and ARRS will co-sponsor the special focus conferences at the 22nd International Congress of Radiology, July 1-5, 2002, in Cancun, Mexico. These special sessions are available for AMA category 1 CME credit. Topics include oncologic neuroimaging, oncologic women's imaging, oncologic abdominal imaging, new frontiers in oncologic imaging and pediatric oncologic imaging.

For more information, contact ISR at (301) 657-2652 or visit www.icr2002.org.mx.

News about RSNA 2002

Refresher Course Enrollment Opens June 24

General registration and refresher course enrollment begin June 24 for the 88th Scientific Assembly and Annual Meeting. Advance registration for members of RSNA and AAPM opened April 29. Each physician may earn up to 80.5 hours of category 1 CME credit. If you have not yet received your Advance Registration and Housing brochure, you may download the information at www.rsna.org.

Important Dates for RSNA 2002

June 24	General Registration, Housing and Course Enrollment Opens
October 11	Registration Deadline for Non-North American Attendees to Receive Badge Wallet by Mail
November 1	Final Advance Registration Deadline
December 1-6	RSNA 88th Scientific Assembly and Annual Meeting

Registration

Online (24 hours a day)

www.rsna.org/rsna/advance/registration/

To start, simply enter the identification number from the mailing label on your registration brochure. If you request hotel reservations, a hotel room deposit will be charged to your credit card.

Fax (24 hours a day)

(800) 521-6017
(847) 940-2386 outside the U.S. and Canada

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(M – F, 8:00 a.m. – 5:00 p.m. CT)
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Please be ready to provide the following information:

- Registration information (name, organization, phone, etc.)
- Fax and e-mail address, if available
- Arrival and departure dates
- Preferred hotels
- Type of hotel room preferred (single, double, etc.)
- Special preferences (smoking, special needs, etc.)
- Credit card information (for hotel deposit)



Digital Transformation

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MCCORMICK PLACE, CHICAGO

Mail

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108 Wilmot Rd., Ste. 400
Deerfield, IL 60015-0823

Keep a copy of your completed registration for your records.

Advance Registration Saves Time & Money

Registration rates increase \$100 onsite, so register by November 1 to save money and avoid long lines at McCormick Place. Also, housing reservations are made on a first-come, first-served basis.

For more information, call (630) 571-7862 or e-mail reginfo@rsna.org.

Exhibitor Planning Meeting

Booth assignments will be released June 25 at the Exhibitor Planning Meeting and Luncheon. All exhibitors for RSNA 2002 are invited to attend the meeting from 10 a.m.–1 p.m. at Rosewood Restaurant and Banquets in Rosemont, Ill., near Chicago's O'Hare International Airport. For those who do not attend, booth assignments along with the exhibitor floor plan will be mailed

Technical Exhibit Hours

Sun., Dec. 1 – Wed., Dec. 4	10:00 a.m. – 6:00 p.m.
Thurs., Dec. 5	10:00 a.m. – 2:00 p.m.

immediately following the meeting. For more information, contact the RSNA Technical Exhibits Department at (630) 571-7851 or exhibits@rsna.org.

NEW

Exhibitor Service Kit on CD-ROM

The Exhibitor Service Kit will be on CD-ROM format this year. It replaces the Service Kit binders that have been used in the past. The Service Kit will mail the week of July 8. It will also be available beginning July 8 on our Web site at www.rsna.org.

The Exhibitor Space Invoice will be mailed separately that same week.

Important Exhibitor Dates for RSNA 2002

June 25	Exhibitor Planning Meeting (Rosemont, Ill.)
July 8	Technical Exhibitor Service Kit Available
July 10	Deadline for Exhibitor Block and Non-refundable Block Housing Forms
July 31	Product Info Deadline for the RSNA <i>Buyer's Guide</i>
July 31	Deadline for Reduction/Cancellation of Exhibit Space (For Full Refund)
Nov. 25	Target Move-in Begins
Dec. 1-6	RSNA 88th Scientific Assembly and Annual Meeting

www.rsna.org

RSNA's CME Credit Repository

RSNA is pleased to announce another benefit of membership: an online CME repository. The CME Credit Repository is a members-only database launched in May 2002. (See page 15.)

Developed by the RSNA Education Center, the repository has two main sections:

- RSNA direct-sponsored and joint-sponsored CME activities
- AMA credits received for non-RSNA CME activities. (These credits must be self-entered. RSNA assumes no responsibility for the accuracy of self-entered CME credits.)

RSNA's CME Credit Repository (www.rsna.org/cme) is accessible from a link on the home page and from a link on the Education



Portal table of contents (www.rsna.org/education/etoc.html).

The system requires a login (your membership number) and password. If you are unfamiliar with the Online Products & Services portion of *RSNA Link*, see https://timssnet.rsna.org/timssnet/login/tnt_login.cfm for information on your membership number to access the CME Credit Repository.

In the RSNA direct-sponsored and joint-sponsored CME section, you can easily display all entries—leave all fields blank and click the “Search” button. You can restrict searches by a range of dates, by activity (such as PowerRAD or *RadioGraphics* journal CME tests) or both.

RSNA members who earned CME credit for InteractED programs (www.rsna.org/education/interactive/) can

find records of that credit in both the InteractED accreditation database (which is also available to nonmembers) and the members-only CME Credit Repository.

Joint-sponsored CME activities are still being entered into the RSNA CME Credit Repository database. A table in the repository indicates the status of this process.

You can report incomplete or incorrectly entered CME credit, or send comments or questions, through a feedback form. When you send your message through the form, the Web server automatically sends your membership number and contact information to RSNA staff and thus reduces response time.

IHE News

This spring, Integrating the Healthcare Enterprise (IHE) published an expanded ver-

sion of the IHE Technical Framework, Rev. 5.3, now in three volumes. The document is available at www.rsna.org/IHE/tf/ihe_tf_index.shtml

These documents will be used for testing and exhibition in 2002 (including IHE activities and exhibits at RSNA 2002) and 2003. The first step in that



process, a workshop for prospective participants, was held April 7-8 at the Hyatt Regency–O'Hare near Chicago. Materials from this meeting are available at www.rsna.org/IHE/participation/index.shtml

Annual Report

The 2001 RSNA Annual Report is now available as a PDF file in the About RSNA section of *RSNA Link*: www.rsna.org/about/annualreport.html

RSNA:WORKING FOR YOU

NEW!

Member-in-Training Benefits Expand

Beginning July 1, a new membership benefit will be added in the Member-in-Training category: Residents and Fellows will receive free online access to *Radiology* and *RadioGraphics*. Print copies of the journals can still be purchased at the subsidized rate of \$80.

Radiology Press Releases

The medical news media receive monthly press releases about scientific studies appearing in *Radiology*. The articles are chosen based on their inter-

est to the general consumer. Each month, *RSNA News* will provide short highlights of the featured press releases (see above) with in-depth reports on select scientific articles in future editions (see page 6). It is all part of RSNA's continuing efforts to increase public awareness about radiology.

Attention Program Directors

Check your mail for important information. A letter was sent to you requesting the names of your first-year residents. RSNA recognizes the need to support and encourage our future leaders in radiology through education and oppor-

tunity. RSNA provides free membership to residents and fellows, free attendance at the RSNA Scientific Assembly, free access to distance learning through InteractED, and beginning in July, free online access to *Radiology* and *RadioGraphics*.

Residents who submit a completed application by August 15 will receive three complimentary print copies of *Radiology* (October, November, and December 2002) and two complimentary issues of *RadioGraphics* (September–October, November–December 2002).

Questions and further inquiries should be directed to membersh@rsna.org.

Medical Meetings

August – October 2002

JULY 28–AUGUST 1

American Healthcare Radiology Administrators (AHRA), Annual Meeting, Morial Convention Center, New Orleans
• lhachero@conferencemanagers.com

AUGUST 18-22

Society of Computed Body Tomography and Magnetic Resonance (SCBT/MR), Summer Practicum, Silverado Resort, Napa, Calif. • www.scbtmr.org

AUGUST 22-25

European Society for Magnetic Resonance in Medicine and Biology (ESMRMB), 19th Annual Meeting, Cannes, France
• www.esmrm.org

AUGUST 23-25

Eastern Neuroradiological Society (ENRS), 14th Annual Meeting, Quebec City, Quebec • (630) 574-0220 x234

AUGUST 24-26

Society of Molecular Imaging, 1st Annual Meeting, Boston
• www.molecularimaging.com/meeting.php3

SEPTEMBER 10-15

American Society of Head and Neck Radiology (ASHNR), 36th Annual Meeting and Symposium, Cleveland Renaissance Hotel, Cleveland • (630) 574-0220 x226 or www.ashnr.org

SEPTEMBER 19-20

Radiological Society of the Netherlands, Annual Meeting, www.radiologen.nl

SEPTEMBER 20-22

Canadian Association of Radiologists (CAR), 65th Annual Scientific Meeting, Chateau Mont Sainte-Anne, Beauport, Quebec
• www.car.ca

SEPTEMBER 25-28

International Skeletal Society, The Swissotel, Istanbul, Turkey
• www.intskelsoc.com

SEPTEMBER 25-29

American Osteopathic College of Radiology (AOCR), Annual Convention, The Westin Bayshore, Vancouver, British Columbia
• www.aocr.org

SEPTEMBER 28-OCTOBER 2

American College of Radiology (ACR), Annual Meeting, Loews Miami Beach Hotel, Miami • (703) 716-7545

SEPTEMBER 28-OCTOBER 2

Society of Chairmen of Academic Radiology Departments (SCARD), Loews Miami Beach Hotel, Miami
• www.aur.org/scard

OCTOBER 3-7

Royal Australian & New Zealand College of Radiologists, 53rd Annual Scientific Meeting, Adelaide Convention Centre, Adelaide, South Australia • www.ranzcr.edu.au

OCTOBER 6-9

Society of Radiation Oncology Administrators (SROA), 19th Annual Meeting, Hotel Intercontinental, New Orleans
• (866) 458-SROA

OCTOBER 6-9

American Society of Radiologic Technologists (ASRT), Ernest Morial Convention Center, New Orleans • www.asrt.org

OCTOBER 6-10

Association of Residents in Radiation Oncology (ARRO), Ernest Morial Convention Center, New Orleans
• (800) 962-7876

OCTOBER 6-10

American Society for Therapeutic Radiology & Oncology (ASTRO), 44th Annual Meeting, Ernest Morial Convention Center, New Orleans • (800) 962-7876

OCTOBER 18-19

Advanced Course in Grant Writing, RSNA Headquarters, Oak Brook, Ill. • (630) 368-3758 or ord@rsna.org

OCTOBER 19-21

American College of Radiology Imaging Network, Ritz-Carlton, Pentagon City, Arlington, Va.
Contact: Irene Mahon at (215) 574-3150

OCTOBER 23-27

Academy of Molecular Imaging, 2002 Annual Conference, Sheraton Hotel and Marina, San Diego • www.ami-imaging.com

OCTOBER 25-27

Society of Radiologists in Ultrasound (SRU), Grand Hyatt San Francisco, San Francisco • www.sru.org/meeting/

NOVEMBER 30

How to Write a Good Grant Application (prior to RSNA 2002), McCormick Place, Chicago • (630) 368-3758 or ord@rsna.org

DECEMBER 1-4

Introduction to Research (during RSNA 2002), McCormick Place, Chicago • (630) 368-3758 or ord@rsna.org

DECEMBER 1-6

RSNA 2002, 88th Scientific Assembly and Annual Meeting, McCormick Place, Chicago • www.rsna.org