Studies Clarify Radiation Therapy Effects on Rectum, Heart

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- U.S. House Subcommittee Hears Testimony on Overuse of Diagnostic Imaging
- NCI Forum Looks at Rapid Changes, Challenges in Quantitative Cancer Imaging
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Distinguished Honorees and Lecturers

The RSNA Board of Directors has announced this year’s list of distinguished honorees and lecturers to whom the Society will pay tribute at the 91st Scientific Assembly and Annual Meeting. They are:

**GOLD MEDALISTS**

Edmund A. Franken Jr., M.D.
Iowa City, Iowa

C. Douglas Maynard, M.D.
Winston-Salem, N.C.

H. Rodney Withers, M.D.
Los Angeles

**HONORARY MEMBERS**

Antonio Chiesa, M.D.
Brescia, Italy

Janet E. Husband, M.D.
Sutton Surrey, U.K.

Rolf-Peter Mueller, M.D.
Cologne, Germany

**EUGENE P. PENDERGRASS NEW HORIZONS LECTURE**

Imaging in Drug Discovery: Emerging Roles and Challenges

**ANNUAL ORATION IN DIAGNOSTIC RADIOLOGY**

Radiology—Back to the Future

**ANNUAL ORATION IN RADIATION ONCOLOGY**

Integration of Functional Images into Future Radiation Oncology Research and Practice

Lawrence Schwartz, M.D.
New York City

William R. Brody, M.D., Ph.D.
Baltimore

K.S. Clifford Chao, M.D.
Houston

In memory of Robert G. Parker, M.D.

Detailed information about each of these honorees and presenters will be available in future editions of RSNA News.
Abstract Submissions Top 9,500

The RSNA Scientific Program Committee will meet in mid-June at RSNA Headquarters in Oak Brook, Ill., to work on the program for the scientific sessions at RSNA 2005.

This year, a record 9,515 abstracts were submitted for presentation consideration—that’s up 243 from last year. Abstracts were required for scientific papers, scientific posters, education exhibits, infoRAD exhibits and radiology informatics, as well as a new interventional oncology program. The Interventional Oncology Symposium is a joint effort between RSNA and the Society of Interventional Radiology Foundation.

More information will be available in a future edition of RSNA News.

World Marks Year of Physics

The United Nations has endorsed 2005 as the World Year of Physics.

The international celebration commemorates the 100th anniversary of the pioneering contributions of Albert Einstein. Through the efforts of a worldwide collaboration of scientific societies, it is hoped that the World Year of Physics will bring the excitement of physics to the public and will inspire a new generation of scientists.

The American Association of Physicists in Medicine (AAPM) is promoting the World Year of Physics with the logo on its Web site and on the cover of its publications. A special booth is planned at the AAPM annual meeting next month in Seattle.

For more information, go to www.physics2005.org.

NEW!

Associated Sciences Program in New Format

The Associated Sciences Consortium has updated the format for its refresher course series and symposium at the RSNA annual meeting. Instead of the refresher courses being spread over six days, four courses will be held on Monday and four will be held on Tuesday during RSNA 2005. The symposium will be held on Wednesday morning.

For more information, go to rsna2005.rsna.org. Course enrollment begins June 20.

Refresher Courses

MONDAY – NOVEMBER 28
• Capital Asset Management: From Acquisition to Replacement Strategies
• Development of the Radiologist Assistant: An Education and Certification Update
• HIPAA: Ongoing Impacts and Re-inventions in Radiology
• Joint Commission on Accreditation of Healthcare Organizations National Patient Safety Goals

TUESDAY – NOVEMBER 29
• PET/CT and SPECT/CT Fusion Imaging: Technical and Clinical Highlights
• The Art and Science of Radiology Planning and Design
• Digital Imaging: Computed Radiography and Direct Radiography
• Controversies in Image-based Screening

Symposium

WEDNESDAY, NOVEMBER 30 (8:30 a.m. – 12:00 p.m.)
Associated Sciences: Radiology’s Leaders—Challenges of the Future
• A. Tomorrow’s Leader: The Radiology Business of the Future
  Patricia Kroken, C.R.A.
• B. Radiology in the Clinical Setting: The Final Frontier
  Suzanne K. Ramthun, M.B.A., R.T.(R), and Carrie E. Abendroth, M.B.A., M.H.A.
• C. Education: The Amazing Race
  Carole South-Winter, M.Ed., R.T.(R), C.N.M.T., B.S.

The Associated Sciences Consortium consists of American Healthcare Radiology Administrators (AHRA), American Institute of Architects—Academy of Architecture for Health (AIASH), 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)
**McClennen President of ARRS**

Bruce L. McClennen, M.D., was named president of the American Roentgen Ray Society (ARRS) during the society’s annual meeting last month in New Orleans.

Dr. McClennen said he is grateful for the opportunity to serve the profession: “Leadership in radiologic societies requires an understanding of the challenges to and changes in our field. It further recognizes the enormous volunteer efforts that radiologists make to advance the missions of our societies,” he said. “Service can be its own special reward. I look forward to my opportunity to work with my colleagues to advance the educational and research causes of our great profession.”

Dr. McClennen is a professor of diagnostic radiology at Yale University School of Medicine and Yale New Haven Hospital. He is also deputy editor of RSNA News.

**ACR Elects New Leaders**

Several new names were added to leadership positions at the American College of Radiology (ACR). Their names were announced at the ACR annual meeting in Washington, D.C.:

**Milton J. Guiberteau, M.D.**
President

**William G. Bradley Jr., M.D.**
Vice-President

**Albert L. Blumberg, M.D.**
Council Speaker

**David C. Kushner, M.D.**
Council Vice-Speaker

New members of the ACR Board of Chancellors are:

- **Manuel L. Brown, M.D.**
- **Paul H. Ellenbogen, M.D.**
- **Carol M. Rumack, M.D.**
- **Geoffrey G. Smith, M.D.**
- **James H. Thrall, M.D.**

**IN MEMORIAM: J. Hal Owsley, M.D.**

J. Hal Owsley, M.D., died April 16 at his home in North Carolina. He was 73.

Dr. Owsley had been an RSNA member for more than 20 years. He served on the ACR Board of Chancellors from 1990 to 1997, and earned the North Carolina chapter’s silver medal for his dedicated service.

**XLR Medical Hires Boyd**

Douglas P. Boyd, Ph.D., an adjunct professor of radiology at the University of California, San Francisco, has been appointed chairman of the board of directors for XLR Medical.

Dr. Boyd is a pioneer in the development of fan-beam CT scanners, Xenon detector arrays and EBT scanners. Until recently, he was the chief scientist at GE Imatron, a company he helped found in 1983. Imatron was acquired by GE in 2001.

**McClennen Joins AMICAS**

Industry executive Peter McClennen has joined AMICAS, Inc., as president and chief operating officer.

McClennen previously was the global general manager for GE Healthcare’s IT PACS business. He was also director of marketing for PACS at FUJIFILM Medical Systems USA, Inc.

**Thrall Elected Board Chair of Mobile Aspects**

James H. Thrall, M.D., is the new chairman of the board for Mobile Aspects, Inc., a leading provider of radiofrequency identification (RFID) tracking solutions for the healthcare industry.

Dr. Thrall, radiologist-in-chief at Massachusetts General Hospital and Juan M. Taveras Professor of Radiology at Harvard Medical School, is also a member of the RSNA Research & Education Foundation Board of Trustees.
THE American College of Radiology (ACR) says it will continue to exercise all options—legislative and non-legislative—in its opposition to the inappropriate utilization of diagnostic imaging. “We will pursue anything that we think we can do to appropriately protect our patients,” said James P. Borgstede, M.D., chairman of the ACR Board of Chancellors.

On March 17, the House Ways and Means Subcommittee on Health heard testimony on managing the use of medical imaging. Dr. Borgstede was among five people invited to testify.

“Given the significant growth in imaging services, we need to carefully examine the existing quality and safety of these services provided in physicians’ offices before requiring providers to meet new quality standards,” said Subcommittee Chair Nancy L. Johnson (R-Conn.). “Is there a problem, and if so, how widespread is it? What types of services are involved? I want to ensure that seniors have access to appropriate, safe, and high-quality imaging services.”

Diagnostic imaging is now a $100 billion a year industry in the United States and is the fastest growing type of physician service expenditure, according to the Medicare Payment Advisory Commission (MedPAC).

“The commission has concluded that it is time for the Medicare program to start to differentiate among providers when making payments. Currently, Medicare pays providers the same regardless of their quality,” said MedPAC Executive Director Mark E. Miller, Ph.D.

Dr. Borgstede told the subcommittee that the overuse of medical imaging procedures by non-radiologists lowers the quality of patient care, undermines patient safety, threatens the solvency of Medicare, and annually drains the American healthcare system of billions of dollars.

“Certainly the payers are concerned about costs, and we agree with them that there are unnecessary costs they are seeing from imaging services,” Dr. Borgstede said. “It is my feeling that a large reason for those costs is inappropriate utilization of imaging because of economically motivated self-referrals. Doctors put imaging equipment in their offices and probably order more examinations than are necessary—and that drives up the cost of healthcare.”

ACR supports many of the MedPAC recommendations that urge Congress to enact laws directing the Secretary of Health and Human Services to set quality and safety standards for providers performing medical imaging.

Dr. Borgstede outlined several concerns: “Is the equipment appropriately maintained? Are registered technologists performing those examinations? Are there physics inspections? What is the quality of the image that’s produced? Are the technical parameters for producing those images appropriately
controlled? And are the appropriate parameters being used that deliver the minimum necessary dose of radiation? Who’s doing the interpretation?”

The MedPAC report includes recommendations about using quality metrics to control the use of diagnostic imaging. Dr. Borgstede said ACR supports the idea.

“If you require people to have registered technologists, physics inspections, board-certified individuals interpreting the examinations with a record of the number of exams per year that they perform and interpret, and their hours of continuing medical education, then you can use quality metrics to keep out the entrepreneurs who are in this for financial motivation,” he said.

**Stark Law**

ACR also supports the MedPAC recommendation that Congress include nuclear medicine and PET procedures under the existing Stark law (the physician self-referral law), and tighten other aspects of the Stark law dealing with physician ownership.

“There are loopholes in the Stark law. There are exemptions, including one involving imaging equipment in your office,” Dr. Borgstede explained. “If you have an imaging center that is a joint venture between radiologists and non-radiologists, that, generally speaking, violates the Stark law. But physicians can get around it by putting imaging equipment in their office. That’s what is called the in-office ancillary exemption.”

Many radiologists would like to see that exemption closed, but Dr. Borgstede said the Federal government hasn’t made it a priority. At its annual meeting in April, ACR amended existing policy on self-referral by adding language identifying the risks of increased radiation exposure to the public.

Cherrill Farnsworth, executive director of the National Coalition for Quality Diagnostic Imaging Services (NCQDIS) and president and chief executive officer of Health Help Inc., also testified before the Congressional subcommittee. She told the panel that NCQDIS believes Medicare should take steps now to protect its beneficiaries.

The NCQDIS recommendations include ensuring that equipment and technologists in an imaging facility meet quality standards.

NCQDIS also recommends that current procedural terminology (CPT®) codes be upgraded to meet current technology. “Now that CT scans are so fast, the technical component should be cost-based,” she said. “The professional component—where the doctor is reading more scans than he ever did before—absolutely cannot be reduced.”

She added that NCQDIS supports physician privileging: “Only certain CPT codes could be done by certain medical specialties—specifically MR, CT and PET should be done only by board-certified radiologists. We’re very big advocates of board-certified radiologists, where that particular modality is not taught in the training of the doctor in an accredited medical school.”

She said that when a physician is not trained in an imaging modality in an accredited medical school environment, Medicare should not pay for their services.

“This is not about a turf battle,” Farnsworth emphasized. “It’s about the quality and safety of the Medicare beneficiaries. Many Medicare beneficiaries don’t even know that their benefit allows them to ask for a board-certified radiologist. We think that’s important and Medicare should be cognizant of that and use the most well-trained person. If we don’t get the diagnosis right, we’re surely not going to get the therapy or the surgery or the pharmacy right.”

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**For more information about the Congressional subcommittee hearing, go to waysandmeans.house.gov/hearings.asp?formmode=detail &hearing=392. The Web site features the hearing advisory, witness list, testimony and hearing transcript.**

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**To view the 2005 MedPAC Report to Congress, go to www.medpac.gov/publications/congressional_reports/Mar05_TOC.pdf.**

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Two new studies on radiation therapy quantify the effects of scattered radiation on surrounding organs and tissues. The underlying message in both studies is that the more targeted the treatment, the lower the risk of subsequent malignancy in the surrounding area—something that the radiation oncology community has always incorporated in the latest treatment options.

**Radiation Therapy for Prostate Cancer**

A retrospective cohort study of more than 80,000 men found that previous radiation treatments for prostate cancer significantly increased the long-term risk of secondary malignancies in the rectum when compared with prostatectomy.

Nancy N. Baxter, M.D., Ph.D., and colleagues at the University of Minnesota School of Public Health in Minneapolis, analyzed the Surveillance, Epidemiology and End Results (SEER) registry data from 1973 through 1994. “We focused on men with prostate cancer, but with no previous history of colorectal cancer, treated with either surgery or radiation who survived at least five years,” the authors wrote in the April 1 issue of *Gastroenterology*.

Compared with the surgery-only group, men who underwent radiation therapy had almost twice the risk of developing rectal cancer. The researchers said the increased risk is similar to that seen in patients with first-degree relatives who are age 65 years or older and who have colon adenomas or colon cancer.

The Baxter study is the third to examine SEER data links between prostate irradiation and secondary malignancies. In 1997, Alfred I. Neugut, M.D., Ph.D., and colleagues found that eight years following treatment there was a significant but “undramatic” increase in the risk of bladder cancer but not rectal cancer in the radiation therapy group. In 2000, David J. Brenner, Ph.D., and colleagues found a “statistically significant, though fairly small” increased risk of second solid tumors of the rectum and bladder, particularly in long-term survivors.

“In light of the long latency for the induction of cancers by ionizing irradiation, the longer follow-up periods in the studies by Baxter and Brenner likely more accurately reflect the true risks of rectal cancer in men who have had prostate cancer radiation therapy,” wrote Ken Russell, M.D., and William M. Grady, M.D., in an editorial accompanying the Baxter paper.

Dr. Russell is a professor in the Department of Radiation Oncology at the University of Washington School of Medicine in Seattle. Dr. Grady is an assistant member at the Fred Hutchinson Cancer Research Center and an assistant professor of gastroenterology at the University of Washington School of Medicine.

Dr. Russell said the Baxter study raises an issue that will become increasingly important as more and more men are successfully treated for prostate cancer. “The germane clinical question appears to be how to detect rectal cancer at an early stage in this group of patients,” he said. “From my
perspective, we’ve always known that there are risks and benefits to any treatment and that there’s a slight risk of malignancy in other sites following radiation. This study notes that for prostate cancer and puts real numbers on it so we can better discuss the risks and benefits with our patients.”

The study also found that with direct radiation of the rectum, nearby and remote tissues were not affected. “As we continue the trend to give treatments that are much more targeted, such as prostate brachytherapy, the risks to surrounding areas will diminish,” said Dr. Russell.

The new study is unlikely to prompt changes in the way prostate cancer is treated given that the rate of rectal cancer was low in both the group treated with surgery and the group treated with radiation.

“The study is interesting from a large population-based perspective, but it is unlikely to significantly affect the widespread use of radiation therapy for prostate cancer,” said Peter A.S. Johnstone, M.D., who is a professor in the Department of Radiation Oncology and director of the Cancer Survivorship Program at the Winship Cancer Institute at Emory University. “Patients receiving radiation therapy for prostate cancer have a known malignancy being treated. Many of these patients are not surgical candidates, so radiation therapy may be the only curative option for the prostate cancer. Second malignancies are a known and rare complication of this potentially curative treatment.”

Dr. Baxter added that no matter what form of radiation delivery is used, the rectum is so close to the prostate that some portion of the rectum will also receive radiation. “We recommend that the potential for developing rectal cancer be included in conversations between doctors and patients when considering the individualized course of treatment and surveillance for patients with prostate cancer. Additionally, we recommend that men who have had prostate radiation be monitored for rectal cancer starting five years after treatment.”

Radiation Therapy for Breast Cancer

The risk of ischemic heart disease and, ultimately, cardiac death following radiation treatment for breast cancer has steadily declined over the last quarter-century, according to a study in the March 16 issue of the Journal of the National Cancer Institute.

The study, which also used SEER data, was conducted by investigators from the M.D. Anderson Cancer Center in Houston. It confirmed that improvements in radiation therapy techniques and delivery have greatly reduced cardiac side effects. The researchers found the hazard of death from ischemic heart disease decreases over time as the radiation dose is reduced.

Web links:

- To view the abstract for the Baxter article, “Increased risk of rectal cancer after prostate radiation: A population-based study,” go to www2.gastrojournal.org/scripts/om.dll/serve?action=searchDB&searchDBfor=art&artType=abs&id=as0016508504023399&nav=abs.
- To view the accompanying editorial, “Ionizing radiation and rectal cancer: Victims of our own success” go to www2.gastrojournal.org/scripts/om.dll/serve?action=searchDB&searchDBfor=art&artType=fullfree&id=as0016508505003525.
- To view the abstract for the Giordano article, “Risk of Cardiac Death After Adjuvant Radiotherapy for Breast Cancer,” go to jncicancerspectrum.oupjournals.org/cgi/content/abstract/jnci/97/6/419.
To understand just how difficult it is to measure a tumor, look at a cloud. Imagine having to precisely define each and every edge.

Quantitative imaging to measure tumors and tumor activity is becoming increasingly important and complex as frontiers expand in both oncology and radiology. Daniel C. Sullivan, M.D., chief of the Cancer Imaging Program (CIP) at the National Cancer Institute (NCI), said tumors—like clouds—have indeterminate edges and obtaining good measurements can involve complex math. In fact, using “fuzzy mathematics,” a sophisticated method to define the parameters of a tumor in terms of probability, may be the best approach to dealing with tumor edges, he said.

Dr. Sullivan and other speakers at the Sixth Annual National Forum on Biomedical Imaging and Oncology, hosted by NCI and the National Electrical Manufacturers Association (NEMA) in April in Bethesda, Md., depicted a rapidly changing field in which new information, especially about molecular targets and biomarkers in cancer, is creating a need for more sophisticated and reliable quantitative imaging techniques. Major themes running through the two-day meeting were the need for more precise methods to assess response to treatment, the need for reference databases to validate software, the importance of standardization, and the need for radiologists and oncologists to work together.

Driving rapid change in oncology is the growing focus on cancer biology at the molecular level. As more and more genes and proteins are implicated in tumor development, researchers are identifying diagnostic markers and creating treatments aimed at molecular targets. Imaging these markers and targets and their activity—say a growth factor receptor that is overexpressed on cancer cells—can help in diagnosing and staging cancer, developing drugs, planning therapy and monitoring response.

Early Response Assessment

When developing a targeted drug, imaging can help show whether the drug is hitting the target and whether that hit results in tumor shrinkage, said Susan Galbraith, M.D., Ph.D., director of the Clinical Discovery Group at Bristol-Myers Squibb. In clinical trials, imaging can offer a way to assess response to a drug early, helping researchers decide whether to continue with development, she said.

Early response assessment can also be a boon to patients, said Richard Schilsky, M.D., associate dean for clinical research at the University of Chicago. “We would dearly love to be able to assess response after one cycle or one dose so we could avoid the toxicity if the drug was not working,” he said. He cited a recent study with FDG-PET to assess response in lung cancer, which showed that PET could help “make therapy decisions at three weeks, rather than after three months of toxic chemotherapy.”

Early response assessment and the imaging of molecular targets are just two of the frontiers in cancer that
involve radiology. Dr. Schilsky also pointed to the use of non-invasive staging, such as the use of PET and CT scans to determine the stage of esophageal cancer. He noted that many people are now interested in using time to progression, or the amount of time before a tumor begins to grow again, as a measure of a drug’s effectiveness in clinical trials. Defining progression is a complex issue. Dr. Schilsky concluded that quantitative imaging could provide information on progression and other aspects of a tumor that can be a surrogate for clinical benefit, though refinements are needed in some areas.

One area in need of refinement is measuring tumor shrinkage in response to treatment. The most common approach to determining tumor size currently uses the Response Evaluation Criteria in Solid Tumors (RECIST) guidelines, which, like the older World Health Organization (WHO) guidelines, are subject to a good deal of intra- and inter-observer variability, said Lawrence Schwartz, M.D., the director of MR imaging at Memorial Sloan-Kettering Cancer Center in New York City. Better, multidimensional methods are needed, including ways to show changes in the volume of the tumor, Dr. Schwartz said.

Software and Reference Databases
Software that can provide valid measurements of tumors, independent of the observer, is another area of intense interest. Noting that software tools have lagged behind image acquisition technology, NCI’s Laurence Clarke, Ph.D., said that one of the major needs in quantitative imaging is for reference databases that can be used to validate software. To this end, NCI is supporting two demonstration projects, both using CT scans from lung cancer trials. In addition, NCI and RSNA are working together to set up an infrastructure for public databases of images from clinical trials using RSNA’s Medical Imaging Resource Center (rsna.org/mirc). An expanded article on MIRC will be included in the July issue of RSNA News.

More and better software is one approach to coping with the growing amount of imaging data, according to a panel of industry leaders. “Data volume grows relentlessly,” said James Williams, Ph.D., a department head at Siemens Corporate Research, Inc., who called for compatible, comparable and portable algorithms among other approaches to this data explosion. Wesley Turner, Ph.D., a computer scientist in imaging technologies at GE Global Research, emphasized the importance of open source software. David Rollo,
M.D., Ph.D., of Philips Medical Systems, called on device manufacturers to adopt interoperable software platforms for their imaging workstations to facilitate the dissemination of image processing algorithms.

As industry leaders discussed the data explosion, a recurring theme was the need for standardization and interoperability. Jeffrey Evelhoch, Ph.D., director of medical sciences imaging at Amgen, had earlier pointed to various barriers to standardized image acquisition, including variations in equipment from different manufacturers, technology changes and differences in protocols followed by different institutions. He advised careful training and monitoring of protocols at different sites. He also stressed the need to keep the image acquisition protocols as simple as possible while still getting the required information.

In recognition of these and other evolving challenges in information technology, RSNA and the Healthcare Information and Management Systems Society established Integrating the Healthcare Enterprise (IHE) in 1998. IHE is an initiative to improve the way computer systems in healthcare share information. It promotes the coordinated use of established information standards to address specific clinical needs.

Collaboration

One other recurring theme of the meeting was the need for radiologists and oncologists to collaborate. “The culture at cancer centers is not rich with collaboration between radiologists and oncologists,” said Gary J. Becker, M.D., branch chief of image-guided intervention at NCI’s CIP and an organizer of the meeting. “This is something we’re trying to change.” One step in that direction is a new supplemental grant announcement from NCI that is designed to stimulate the creation of Imaging Response Assessment Teams (IRATs) in NCI-designated Cancer Centers. IRATs will be made up of radiologists, imaging scientists and oncologists who will integrate imaging with assessment of response to treatment.

Dr. Becker, who serves as RSNA’s board liaison for science, said that he supports the idea of making oncologic imaging an official subspecialty of diagnostic radiology. He noted that cancer has now surpassed heart disease as the leading cause of death in people under age 85. “I firmly believe that it should be a subspecialty,” he said. “We’re in a different world now.”

Studies Clarify Radiation Therapy Effects on Rectum, Heart

Continued from page 7

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Gary J. Becker, M.D.

Continued from previous page

disease for women with left-sided versus those with right-sided disease was higher in the patient treated before 1979 but equivalent in the patients treated in the 1980s.

“Our study is certainly encouraging,” said co-author Thomas A. Buchholz, M.D., a professor of radiation oncology at M.D. Anderson. “Radiation oncology has always been troubled by early studies comparing radiation after mastectomy, which found that after 10 years or so, women started to die of heart disease that likely was linked to their radiation treatment.”

Dr. Buchholz said this new study, led by Sharon Giordano, M.D., showed that in the 1970s and 1980s, radiation therapy associated heart problems began to fall—most likely as a result of advances in technology and techniques used to deliver radiation. “I’m confident, based on these data and the further improvements that we’ve made, that the modern breast cancer patient getting radiation does not have to be concerned about the risk of heart-related death.”

He added that the important lesson is that while it’s clear that radiation therapy improves the cure rate and survival of breast cancer patients, “Radiation oncologists should understand the advantages of new technology so that cardiac risk can be reduced.”
NOT SCRUTINIZING a radiology practice’s performance indicators is like driving a car without a dashboard, according to Pablo R. Ros, M.D., M.P.H., a radiology professor at Harvard Medical School, chief of the Division of Radiology at the Dana-Farber Cancer Institute and executive vice-chairman of the Department of Radiology at Brigham and Women’s Hospital.

He’s convinced that identifying and reviewing the data from performance indicators can help radiologists create a roadmap that effectively leads their practice into the future.


“Expert presenters will offer valuable insights in the areas of financial management, strategic planning, billing compliance, contracts and legal matters,” explained course director Lawrence Muroff, M.D., CEO of Imaging Consultants in Tampa. “RSNA took the lead in establishing this course and there’s no doubt about the demand for this information in private practice and in academia.”

Dr. Ros concurred, saying most radiologists attending business courses have been previously recognized for their scientific and clinical leadership, and now they’ve become involved in practice management. “They are like I was 20 years ago,” Dr. Ros explained. “I never had medical management or business training. At that time, you either had to learn business concepts by going to school and earning an M.B.A. or M.P.H. in healthcare management, or learn through trial and error. I think there is a tremendous demand among radiologists for education in these arenas.”

**Survey of Academic Radiology Departments**

Interest in practice economics is part of what motivated Dr. Ros and his research partners to conduct a national survey of U.S. academic radiology departments. The research team, led by Silvia Ondategui-Parra, M.D., M.P.H., M.Sc., published their findings in the December 2004 issue of *Radiology*.

The goal was to find out which management performance indicators were most frequently used in overall assessments. They found that academic radiology departments in the United States do not use a comprehensive set of indicators to monitor performance, and there is no consistency among departments as to which indicators are used.

“Unlike other industries, such as finance or insurance, where you can observe through standard measures how a business is performing, we surprisingly found that in radiology it is almost a free for all,” Dr. Ros explained.

The researchers found that in academic radiology departments, productivity indicators were most frequently used to measure performance; however, comparisons among institutions were difficult because of the lack of uniform measures of productivity.

“One department may use examination volume, while another uses relative

**The best way to be efficient and maximize your potential with the resources you have, is to use a meaningful radiology dashboard.**

Pablo R. Ros, M.D., M.P.H.

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**Performance Spiderweb Chart**

[Image of Performance Spiderweb Chart]

Graphic courtesy of Pablo R. Ros, M.D., M.P.H.
value units, which take into account the time, complexity and cost of performing a service,” Dr. Ros explained. “Benchmarking efforts within radiology have been slowed by inconsistencies, but I think eventually we will get into a more normalized situation. It’s hard to count volumes because in some departments if you do a CT scan of the chest, abdomen and pelvis on the same patient, it will count as three exams while in another department it will count as one exam.”

**Drive Toward Standardized Practice Performance Measures**

One of the factors driving the need to collect and standardize information is the new emphasis on department and radiology practice goals. “If you ask heads of radiology departments about their multi-year strategic plans, we are finding not too many chairs are doing them. People are planning at one or two-year vistas and are trying to concentrate on what we are getting for the next fiscal year cycle,” said Dr. Ros. “In some hospitals, this is changing. There is a tendency to require radiologists to have multi-year strategic plans because margins are decreasing as a result of decreasing reimbursements per study. The best way to be efficient and maximize your potential with the resources you have, is to use a meaningful radiology dashboard.”

The “Essential Performance Indicators” session will describe ways successful radiology leaders—in private practice or in hospital-based settings—can convert broad goals into quantifiable metrics. Those measurements are compiled and examined in ways that provide a window into a practice or department’s activity. Dr. Ros describes graphic representations of the indicators on a circular “spiderweb.” Performance indicators are plotted in points along the circle’s circumference and values are then plotted inside the chart. Simply connecting the dots provides a visual snapshot of all the indicators at once and can provide a monthly, quarterly or yearly comparison. Dr. Ros believes such a snapshot supplies vital information to physicians under increasing pressure in both academic and private practice settings. “In radiology, the technology and the economics have become so complicated that the expenses and the business risks are high. The competition is such that radiologists have to become involved in the management of their practices.”

Dr. Muroff believes course attendees will have a valuable opportunity to learn budgeting and planning strategies they will use yearly. “The takeaway message here is that good medicine and good business can go hand in hand. In fact, you can practice better medicine if you understand the business aspects of your practice.”

To learn more about the Business Strategies for Radiology Leaders course, go to www.rsna.org/education/shortcourses/index.html.

To read the *Radiology* article, “Practice Management Performance Indicators in Academic Radiology Departments,” RSNA members and journal subscribers can go to radiology.rsna.org/cgi/content/full/233/3/716. The abstract is available to everyone at radiology.rsna.org/cgi/content/abstract/233/3/716.
Innovation, Practice Patterns Change Refresher Courses for RSNA 2005

JUST AS technologies are changing medical treatment and care, technology and methodology are changing how refresher courses are structured and delivered at the RSNA annual meeting.

Refresher courses are the most popular feature of the annual meeting. Each year, about 300 refresher courses are offered covering traditional and cutting-edge topics in subspecialty areas. At RSNA 2005, there will be 136 new refresher courses, four new refresher course tracks, four new Essentials of Radiology courses and a new case-based review course.

In the past, MR and CT had dedicated course tracks. Beginning this year, courses on these modalities will be folded into tracks organized by organ system. For example, musculoskeletal MR will be included within the musculoskeletal imaging course track.

“The changes in how course content is organized makes them more effective for the attendee,” explained RSNA Board Liaison for Education Theresa C. McLoud, M.D. “Individuals will experience learning material that more closely mirrors today’s practice.”

RSNA Board Liaison-designate for Education George S. Bisset, III, M.D., agreed. “This is how people practice medicine today. We have moved away from a modality-based approach. Organ-based imaging should make the refresher courses more appealing to those in private practice,” he said.

“The blending of the MR and CT imaging content into the organ system course track is a pilot initiative that will be carefully assessed to determine its overall effectiveness,” said Dr. McLoud.

Prominent Role for MR Imaging
Because new technological advances occur particularly rapidly in the field of MR imaging, a special mini-course at RSNA 2005 will be devoted to advances in MR technology, pulse sequences and protocols.

Thirty refresher courses reference MR in the title and 64 additional courses include MR as a major portion of the course curriculum. A new Essentials of Radiology course will focus on abdominal MR.

As with MR, CT topics have been expanded and folded into all of the diagnostic imaging tracks.

“This is the first time so many changes were made to the refresher courses in one year. These important transformations are needed to ensure that attendees maintain their professional excellence,” said Robert A. Novelline, M.D., chairman of the RSNA Refresher Course Committee.

Four New Course Tracks
Four new refresher course tracks were developed to address the current educational needs of imaging professionals. The new tracks are cardiac radiology, emerging technologies, radiology education and vascular radiology.

Continued on next page
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“The expanded cardiac track is a response to the increased demand for cardiac imaging,” explained Dr. Novelline. “It will cover the latest in cardiac CT, cardiac MR, coronary artery CT and myocardial infarction imaging with MR, SPECT and PET.”

The emerging technologies track will cover the latest in molecular imaging probes and molecular imaging modalities, as well as covering pertinent topics in molecular biology. “These new courses will allow us to address new and evolving trends in molecular imaging,” said Dr. Bisset.

The radiology education track will include sessions on medical student and radiology resident education, teaching skills, delivering presentations, reviewing manuscripts, continuing medical education, electronic aids and self-assessment.

The vascular track will feature the latest in vascular contrast agents and post-processing techniques for vascular imaging, MR angiography, CT angiography and digital subtraction angiography. It will also include presentations on vascular pathology in adults and children.

**Interactivity in Refresher Courses**

New maintenance of certification (MOC) requirements by the American Board of Radiology (ABR) were another driver behind the changes in the refresher courses. “RSNA is developing self-assessment modules (SAMs) to help members audit their radiology skills and knowledge base,” said Dr. Bisset. “Some of the refresher courses at RSNA 2005 may include a self-assessment component. Under the ABR MOC requirements, an individual is encouraged to complete at least two SAMs each year.”

The audience response systems (ARS), used in interactive courses, help the instructors tailor their courses to the competency level of the audience. “This year, the number of courses including ARS technology will double to about 15, and all case-based review courses will also include ARS,” said Dr. Novelline. “Instructors will be able to ask the audience questions and then see their answers on a screen. The instructors can then alter the course material based on the responses. Studies have shown that people learn more when they’re involved and get individualized feedback.”

The RSNA 2005-2008 Strategic Plan includes seven primary goals. The first goal is to “Conduct activities to meet the educational and continuing professional development needs of RSNA members.” Among the strategies to achieve that goal are to:

- Apply expertise in adult educational methodologies to maximize learning
- Tailor educational activities to meet the needs of members and allied professionals
- Facilitate continuing professional development and the means for maintenance of certification in collaboration with other societies as appropriate

“Changing and reorganizing the refresher courses help us meet that goal,” explained Dr. McLoud. “The RSNA Board understands that in order to keep up with the rapidly changing applications, technologies and methodologies in radiology, the organization needs to evaluate and update how it provides lifelong learning opportunities to its members.”

A special focus session is planned for RSNA 2005 featuring “best papers” from the International Society for Magnetic Resonance in Medicine (ISMRM) annual meeting held last month in Miami.

ISMRM is also working with RSNA to develop a case-based review course in MR that will debut at RSNA 2006.

**Refresher Course Enrollment Begins June 20**

Advance registration for refresher courses is required, so the earlier you sign up, the better the chances are that you’ll get the courses you want.

Refresher course enrollment begins June 20. Go to rsna.org and click on the Advance Registration, Housing and Course Enrollment brochure and follow the directions.

More information on how to register for RSNA 2005 is on page 27.

This year’s annual meeting offers the opportunity to earn up to 83 AMA PRA category 1 CME credits.
This Report is intended to be a practical guide to physicians who interpret mammographic images, technologists who perform mammographic examinations, as well as medical physicists who monitor mammographic facilities, evaluate image quality, and determine radiation dose. Mammography is one of the most difficult radiographic examinations technically. Both specialized equipment and the correct use of that equipment are essential to the achievement of satisfactory results. Facilities should not perform the examination if they are unable or unwilling both to: (1) provide and maintain x-ray equipment, image receptors, film processors, and viewing conditions capable of producing the necessary images at acceptable dose levels; and (2) ensure that the examination is performed with the proper technique factors, patient positioning, and compression. In fact, the implementation of MQSA (1992) has made it illegal for facilities to continue to perform mammography unless these conditions are fulfilled. This Report contains several major sections, a summary, and conclusions, and an extensive bibliography.

RSNA Member Price $88.00

Report No. 147, Structural Shielding Design for Medical X-Ray Imaging Facilities

This Report includes a discussion of the various factors to be considered in the selection of appropriate shielding materials and in the calculation of barrier thicknesses. The Report presents the fundamentals of radiation shielding, discusses “shielding design goals” for “controlled” and “uncontrolled” areas in or near x-ray imaging facilities, and defines the relationship of the shielding design methodology for x-ray imaging facilities, and provides an extensive collection of shielding data and sample shielding calculations for various types of x-ray imaging facilities. This Report is mainly intended for those individuals who specialize in radiation protection. However, it will also be of interest to architects, hospital administrators, and related profession with data on the planning of new facilities that use x-rays for medical imaging. 194 pp.

RSNA Member Price $80.00

Report No. 145, Radiation Protection in Dentistry

This Report provides radiation protection guidance for the use of x-rays in dental practice, including advice on shielding design for dental x-ray facilities. It supersedes NCRP Report No. 35, Dental X-Ray Protection, which was issued in March 1970. Dentists who conduct their radiology practices in accordance with the requirements and suggestions in this Report can obtain maximum benefit to the oral health of their patients and minimum radiation exposure to patient, operator and the public. All of the factors addressed in this Report are important and interrelated. Quality practice dictates that none be neglected. The technical factors, including office design and shielding, equipment design, clinical techniques, image receptors, darkroom procedures, and quality assurance are essential. However, the professional skill and judgment of the dentist in prescribing radiologic examinations and interpreting the results are paramount.

Informed consent requires that dental patients be provided with information as to the benefits and risks of dental procedures, including dental radiography. This Report provides the dentist with data on the magnitude of effective doses from typical x-ray procedures. General statements are given that can be used to inform the patient about the nature of risks associated with these doses. 191 pp.

RSNA Member Price $40.00

Report No. 133, Radiation Protection for Procedures Performed Outside the Radiology Department

This Report includes five sections, two appendices, a glossary, and references. Section 1 introduces sources of occupational radiation exposure, and compares occupational exposures in medicine with other sources of occupational exposure. Section 2 describes radiologic medical procedures that are often performed outside the radiology department and categorizes the procedures according to their potential for occupational exposure. Section 3 addresses conditions that affect potential radiation exposure, such as time, distance, shielding, and orientation of radiation source, patient and operator. Section 4 addresses medical personnel monitoring and Section 5 briefly addresses the responsibility of management to provide safe conditions for both employees and patients. Appendix A provides information on the philosophy of radiation protection and the biological effects of medical x-rays. Appendix B describes the x-ray imaging process for various imaging devices. 104 pp.

RSNA Member Price $24.00

Report No. 128, Radionuclide Exposure of the Embryo/Fetus

This Report is designed to provide information on radiation dose to the embryo/fetus from radionuclides in the mother. The Report has 10 sections making up some 92 pages consisting of an introduction, sources of exposure, review of recommendations and regulations regarding exposure of the embryo/fetus, prenatal development, maternal-fetal exchange, and fetal irradiation effects, fetoplacental concentrations and radiation doses, estimation of embryo/fetus dose in radiation protection practice, research needs, and a summary and conclusions. A large part of this Report, 125 pages, provides biological information, fetal/placental information and radiation dose estimates for 83 radionuclides. The Report contains a glossary of terms, 40 pages of references, and an index. 287 pp.

RSNA Member Price $28.00

Report No. 116, Limitation of Exposure to Ionizing Radiation

This Report is the latest in the long series of reports on basic radiation protection criteria that began in 1934. It supersedes the predecessor in the series, NCRP Report No. 91, which was published in 1987. The current Report takes advantage of new information, evaluations and thinking that have developed since 1987, particularly the risk estimate formulations set out in NCRP Report No. 115. While the recommendations set out in this Report do not constitute a radical revision of the basic criteria, they do represent a refinement of the system Report No. 91, provided a number of important changes include the utilization of new dosimeter/organ weighting factors and the introduction of radiation weighting factors. Also noteworthy is the introduction of an allowable reference level of intake. Noteworthy too is the recommendation of an age-based lifetime limit for control of occupational exposures and a major simplification of limits aimed at controlling the exposure of the embryo and fetus. This Report, after outlining the goals and philosophy of radiation protection and the basis for exposure limits, goes on to review, in some detail, absorbed dose, equivalent dose, radiation weighting factors, and effective dose. Committed equivalent dose and committed effective dose are also introduced. Risk estimates for radiation exposure are presented and then the dose limits are enunciated. The Report also covers exposure in excess of the limits, limits for unusual occupational situations, guidance for emergency occupational exposure, and remedial action levels for naturally occurring radiation. 88 pp.

RSNA Member Price $28.00

Continued on next page
tion and numerous new images in computed tomography and magnetic resonance. It features 232 copies of line drawings that can be placed as transparent overlays on the images for direct identification of the anatomical structures.

Students and healthcare professionals alike will find this authoritative atlas indispensable for its unique balance of historical insight, detailed images and drawings, and techniques for practical application. Table of Contents:

- Conventional Radiography
- Angiography
- Nerve Conduction Studies
- Gynecologic Radiography
- Sonography
- Computed Tomography (CT)
- Magnetic Resonance Imaging (MRI)
- Scintigraphy

Paperback, 362 pp., 2004
RSNA Member Price $44.00

**Book**

**Atlas of Human Anatomy, Third Edition**

The ultimate anatomy atlas for medical study, clinical reference, and patient education, this updated masterpiece offers the power of over 500 precise visual images that teach without an overwhelming amount of confusing text. Chosen by more students for their anatomy coursework than any other human anatomy atlas published today. Paperback, 2003

RSNA Member Price $55.16

**Book & CD-ROM**

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The ultimate anatomy atlas for medical study, clinical reference, and patient education, this updated masterpiece offers the power of over 500 precise visual images that teach without an overwhelming amount of confusing text. Casebound edition includes the FREE CD (Interactive Atlas of Human Anatomy, v3.0) packaged with the book.

RSNA Member Price $103.96

**Book**

**Netter’s Concise Atlas of Orthopaedic Anatomy**

This concise, easy-to-use atlas of orthopedic anatomy utilizes Netter images from both the Atlas of Human Anatomy and the 13-volume Netter Collection of Medical Illustrations. Each image includes key information on bones, joints, muscles, nerves, and surgical approaches. Each chapter contains clinical material showing trauma, minor procedures, history and physical exam, disorders, and radiology.

RSNA Member Price $34.80

**Book**

**Netter’s Obstetrics, Gynecology and Women’s Health**

This comprehensive guide uses a quick-reference tabular format to present the major diseases and conditions traditionally seen in the practice of obstetrics and gynecology, as well as general medical conditions commonly seen in women. Includes more than 200 topics and over 500 Netter illustrations.

RSNA Member Price $51.96

**Book**

**Netter’s Internal Medicine**

Designed to help practitioners manage everyday medical problems with confidence and authority, this superior reference is also invaluable to students, residents, and specialists who need quick access to reliable clinical information. Combines over 450 Netter images and the most current knowledge on common diseases/conditions, diagnostics, treatments and protocols into a single, easy-to-use guide.

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**Book**

**Atlas of Palpatory Anatomy of Limbs and Trunk**

Serge Tixa

Palpation anatomy is based on the manual inspection of surface forms—visual and instructive method of investigating anatomic structures. In this new atlas, each structure is shown with a photo and is accompanied by a description of the technique used. Netter Illustrations are used to introduce each section of the atlas and highlight key anatomical structural features.

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Two Chart Set
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**Interactive Head & Neck**

Barry Berkhovitz, Claudia Fisch, Bernard J. Monahan, Ghassan Aloui, Tony W. Stoeller

Detailed and labeled 3D model of the head and neck that can be rotated and layers of anatomy added or stripped away. 3D model is supplemented by text, MRI, clinical slides, video clips and 3D animations.

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**Interactive Spine**

Hilal Noorbakhsh, Hazem Elsebaie, Alan Crockett, Robert B. Winter, John Lonstein, Ben Taylor, Roger Soames, Peter Renton, Stewart Tucker, Lester Wilson, Joseph J. Crockard

Detailed and labeled 3D model of the entire spine that can be rotated and layers of anatomy added or stripped away. 3D model is supplemented by text, MRI, clinical slides, video clips and 3D animations.

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**Interactive Knee**

Paul Aichert, Vishy Mahadevan, Justin M. Holcomb, David W. Stoller

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**Interactive Foot & Ankle**

Vishy Mahadevan, Robert Anderson, Lloyd Williams, Penny Renwick, David W. Stoller

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**CD-ROM**

**Sports Injuries: The Knee**

Paul Aichert, Roger Wolman, Tracy Maund, Andrew Amis, Anthony Bull

3D model of the knee that can be rotated and layers of anatomy added or stripped away. 3D model is supplemented by sports injuries, rehabilitation and biomechanics text, clinical slides, video clips and 3D animations.

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**CD-ROM**

**Orthopaedics In Action: Primary Hip Arthroplasty**

T.W.R. Briggs, M.Ch. (Orth) FRCS, Consultant Orthopaedic, S.R. Cannon, J. Skinner

3D model of the hip that can be rotated and layers of anatomy added or stripped away. Covers all aspects required for primary Total Hip Arthroplasty, from patients first visit to outpatients clinic through pre-operative planning phase and the surgical procedure itself, utilizing both lateral and posterior approaches. Descriptive text is supplemented by live surgery video clips and 3D animations.

RSNA Member Price: $250.00

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**Book**

**Mayo Clinic: Gastrointestinal Imaging Review**

Daniel Johnson

Offering four times the amount of
imaging cases offered by competing texts, this reference stands as the foremost guide to common diseases and radiographic presentations found within the gastrointestinal tract, authoritatively covering the entire range of gastrointestinal diseases to include conditions affecting the esophagus, stomach, duodenum, small bowel, colon, liver, biliary tree, gallbladder, pancreas, spleen, peritoneum, and mesentry.

RSNA Member Price: $95.00

**BOOK**

**Imaging in Oncology**

Janet Husband

Imaging in Oncology, Second Edition, presents an extensively referenced, evidence-based analysis of the role of imaging in planning treatment. Emphasizing image interpretation for tumor staging and follow-up, the editors and their panel of co-authors for chapter authors explore the advantages and limitations of all relevant imaging modalities including ultrasound, CT, MRI, PET/CT, and other nuclear medicine techniques.

RSNA Member Price: $445.50

**BOOK**

**Bioelectromagnetic Medicine**

Paul Roach

This 50-chapter volume emphasizes cutting edge breakthroughs in disorders ranging from cancer, coronary disease and obesity to neuropsychiatric disturbances, including Parkinson’s disease; epilepsy; multiple sclerosis; tinnitus; macular degeneration; migraine; musculoskeletal pain syndromes; depression; insomnia; and anxiety.

RSNA Member Price: $179.95

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**BOOK**

**Intravascular Brachytherapy / Fluoroscopically Guided Interventions**

Stephen Butler, Rosanna Chan, Thomas Shope, eds.

Explores the techniques involved in the use of fluoroscopic guidance in minimally invasive therapeutic procedures, using intravascular brachytherapy as an example of such a procedure. 930 pp.

RSNA Member Price $95.00

**BOOK**

**Biological & Physical Basis of IMRT & Tomotherapy**

Bhuvat Paliwal, et. al.

Presents the current status of the biological, physical/technical and clinical aspects of volume effects on time, dose and fractionation schemes for radiation treatment of cancer patients and the several parametric models (Both explanatory and predictive) of the effects thereof, with regard to optimization of treatment planning. 390 pp.

RSNA Member Price $80.00

**BOOK**

**Recent Developments in Accurate Radiation Dosimetry**

Ian Secrundgans and Paul Motib, eds.

The dramatic advances in absorbed-dose-to-water standards and in Monte Carlo ion chamber response calculations that have been made in the last 10 years and their application in accurate radiation dosimetry are summarized. 365 pp.

RSNA Member Price $70.00

**BOOK**

**Clinical Ultrasound Physics: Workbook for Physicists, Residents, and Students**

James Koffler Jr., et. al.

An instructor’s manual to assist physicists in teaching ultrasound physics concepts to non-physics personnel (residents, sonographers, graduate students, etc.) 85 pp.

RSNA Member Price $40.00

**BOOK**

**Nuclear Medicine Instrumentation Laboratory Exercises for Radiology Residency Training**

R.J. Van Tuijlen, et. al.

These exercises provide residents with insight into each instrument, its capabilities and limitations and the value of quality control testing, 88 pp.

RSNA Member Price $30.00

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Multi-Detector Row CT Systems and Image-Reconstruction Techniques

A milestone in the evolution of computed tomography came in 1998 when the major manufacturers introduced multi-detector row CT (MDCT).

MDCT allows substantial reduction in examination time for standard protocols, coverage of extended anatomic volumes, and, most important, substantially increased longitudinal resolution by means of reduced section width.

In a special review article in the June issue of Radiology (rsna.org/radiology), Thomas G. Flohr, Ph.D., from Siemens Medical Solutions in Forchheim, Germany, and colleagues discuss:
- General technical principles of MDCT
- Most recent 16-section scanners
- Future generations of MDCT systems
- Patient radiation exposure
- Evolution of spiral CT

Clinical examples are used to demonstrate both the potential and the limitations of the different scanner types.

The article also includes “Essentials” or highlighted points to help busy readers recognize important information at a glance.

Spinal Changes in Patients with Spondyloarthritis: Comparison of MR Imaging and Radiographic Appearances

The recent availability and effectiveness of tumor necrosis factor (TNF) α inhibitors for treating spondyloarthritis have resulted in referring rheumatologists requesting sensitive visualization of inflammatory changes of the entire spine.

Because changes in spondyloarthritis may be very subtle, the proper MR imaging protocol is very important.

In a review article in the May-June issue of Radiographics (rsna.org/radiographics), Kay-Geert A. Hermann, M.D., from the Charité Medical School in Berlin, Germany, and colleagues discuss:
- Spondylitis (active Romanus lesions) in a 34-year-old patient with ankylosing spondylitis.

Sagittal T1-weighted turbo spin-echo (a) and STIR (b) images of the thoracic spine show florid Romanus lesions (anterior spondylitis) at T6-7, T8-9, and T10-11 (arrowheads). The lesions are seen at the anterior vertebral edges as a circumscribed increase in signal intensity on the STIR image and a decrease in signal intensity on the T1-weighted image.

Illustration of adaptive multiplanar reformation approach.

(left) First, multisection spiral CT data are used to reconstruct several partial images on double-oblique image planes, which are individually adapted to the spiral path. Partial images fan out like pages of a book. (right) Second, final images with full dose utilization are calculated with z-axis interpolation between tilted partial image planes.

Continued on next page
Diagnostic Imaging Costs: Are They Driving Up the Costs of Hospital Care?

Utilization of inpatient CT, MR imaging and other imaging technologies has increased substantially over the past few years, but diagnostic imaging does not appear to be the catalyst behind the crisis in healthcare costs. In fact, for every $100 spent on inpatient diagnostic imaging, hospitalization was reduced by about six hours.

Molly T. Beinfeld, M.P.H., and G. Scott Gazelle, M.D., M.P.H., Ph.D., from Massachusetts General Hospital (MGH) and Harvard Medical School in Boston, retrospectively studied data on patients admitted to MGH between 1996 and 2002.

In that time period, they found total costs increased an average of 7.8 percent per year while imaging costs increased 8.3 percent per year.

“Despite substantial increases in utilization of inpatient CT, MR imaging, and other imaging technologies, diagnostic imaging costs increased at approximately the same rate as did total costs for inpatients with several diagnoses. CT and MR imaging do not appear to be driving the cost increases seen between 1996 and 2002,” they concluded.

Graph depicts total hospital and inpatient imaging costs at MGH, according to fiscal year for years 1996 through 2002. All costs are presented relative to 1996 levels (i.e., 1996 levels are set to 100 percent). In 2002, total hospital costs were 55 percent higher than they were in 1996 and inpatient imaging costs were 51 percent higher than they were in 1996.

Spinal Changes in Patients with Spondyloarthritis

Continued from previous page

Berlin, and colleagues describe the typical MR imaging features of inflammatory lesions in ankylosing spondylitis and other spondyloarthritides and compare them with radiographic findings.

They also discuss:
• Suitable MR imaging protocol
• Various inflammatory changes of the spine
• Role of MR imaging and conventional radiography in depicting different findings of seronegative spondyloarthritis

A commentary by Betty J. Manaster, M.D., Ph.D., is also available.

This article meets the criteria for 1.0 CME credit.

Media Coverage of Radiology

In April, 118 print, broadcast and online media outlets carried news stories generated from articles appearing in Radiology. These stories reached an estimated 90 million people.

Highlights included NBC national syndication about staffing shortages at community mammography facilities (Radiology 2005; 235:391-395) and a brief article in the May issue of Health magazine about the costs associated with whole-body CT screening (Radiology 2005;234:415-422).

Working For You

Radiology Program Directors
RSNA is working with radiology program directors to make sure that all first-year residents take advantage of free membership in RSNA. A sampling of RSNA journals and some membership applications will be sent to the program directors.

Residents who submit a completed application by August 15 will receive three complimentary print copies of Radiology (October, November and December 2005), and two complimentary issues of RadioGraphics (September-October and November-December 2005).

For more information or membership applications, go to RSNA.org/mbrapp.

Fellows, Where Are You?
Fellows are also entitled to free membership in RSNA. Letters have been sent to all residents, who completed their training this spring, requesting that they provide RSNA with their updated contact information to keep their membership current.

Fellows are eligible for free admission, with advance registration, to the RSNA annual meeting, as well as free online access to Radiology and RadioGraphics.

You can update your information by e-mail at membership@rsna.org or by phone at (877) RSNA-MEM [776-2636].

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RSNA Marketing & Communications
The department comprises four main areas: member communications (RSNA News, RSNA Annual Report, etc.), direct marketing (annual meeting registration, R&E Foundation annual appeal, etc.), media relations (press releases for Radiology and the annual meeting, etc.) and public outreach (RadiologyInfo.org, public service announcements, etc.).

Each area has distinct responsibilities and objectives, and works collaboratively with others to achieve success.

The department reports to RSNA Assistant Executive Director Roberta E. Arnold, M.A., M.H.P.E.
DAVID L. Levin, M.D., Ph.D., describes his life and experience with his 2000 RSNA Research Scholar Grant in the same terms physicists use to describe the movement of subatomic particles—“a random walk”—referring to chaotic movement that can appear well-ordered when viewed from a distance.

This month, Dr. Levin became an associate professor of radiology at the University of California, San Diego (UCSD). He earned his joint M.D., Ph.D., in the Medical Scientists Training Program at UCSD. He completed the Radiology Scholars Program and a thoracic imaging fellowship at the University of California, San Francisco before working as a clinical instructor at Harvard’s Beth Israel Deaconess Medical Center in Boston. In 1999, he returned to UCSD.

While at Beth Israel, Dr. Levin participated in research projects using MR perfusion imaging techniques to evaluate pulmonary function. It was this work that he set out to refine and expand using his RSNA research grant.

“I have always been interested in finding out how the lung works,” said Dr. Levin. “I thought it would be fascinating to apply radiology methods to look at how the lungs function rather than just looking at their structure.”

Blood flow and ventilation are the two key factors that define pulmonary function, according to Dr. Levin. It’s how the blood flow and ventilation are distributed that determines how well the lung works for sick patients, as well as for healthy patients who are exposed to conditions such as exercise and altitude.

MR imaging previously had been limited in evaluations of this sort, but advances in hardware design and imaging sequences have improved screening to the point where it can now be used to evaluate pulmonary perfusion.

He began work on five research objectives that he hoped would allow him to develop a replacement for lung assessment techniques that had not been updated since the 1950s and 1960s.

His objectives were to:
1. Use existing MR sequences to evaluate pulmonary perfusion in healthy volunteers
2. Improve methods of data analysis and quantification of regional perfusion
3. Verify independently measures of regional perfusion in an animal model
4. Use existing MR sequences to evaluate alterations in pulmonary perfusion in patients with disease states
5. Develop new sequences to allow for multislice coverage with improved spatial and temporal resolution

But there was a problem. “We began working on objectives 1 through 4 and quickly realized that we simply couldn’t complete them until we had undertaken objective 5, which was to completely redefine how we were going to evaluate the lung,” explained Dr. Levin. “The traditional methods we had immediately available were limited and simply would not allow us to answer the questions we felt were important from a physiology and pathophysiology standpoint.”

Consequently, Dr. Levin spent most of the RSNA cycle pursuing objective 5 by outlining what the team needed to know and then successfully developing the necessary assessment technique.

“Starting at 5 was not what I had envisioned,” he said laughing. “I often look at other people’s research and think, ‘Wow, theirs was this nice, logical progression that worked out exactly how they anticipated it would and I started with objective 5.’”

Nevertheless, his technique was recently used to address a 40-year-old question, “Why are some people prone to high-altitude pulmonary edema while others remain unaffected?”

The theory had been that the potentially fatal illness, which may affect as many as 10 percent of people traveling to high altitudes, was the result of a change in uniformity of blood flow brought on by hypoxia. But there had never been a way to prove it—until now.

Dr. Levin and his UCSD colleague, Susan Hopkins, M.D., Ph.D., identified three groups:
• Those who had been to high altitude for long durations without a problem
• Those who had experienced high-altitude pulmonary edema
• Those who had never traveled to high altitudes

All the subjects were made hypoxic at sea level by inhaling a low-oxygen-
Program and Grant Announcements

**Business Strategies for Radiology Leaders**

Register online at RSNA.org/education/shortcourses for this three-day, RSNA course designed for radiologists in leadership positions and for radiology business managers. The course will be held **July 29–31** at the Hotel InterContinental Chicago.

**Topics include:**
- Strategic Planning
- Radiology Department Budgeting
- Business Infrastructure
- Contracting with Managed Care Entities
- Contracts Between Radiology Groups and Their Group Members and Hospitals
- Turf Battles in Radiology
- Joint Ventures Between Hospitals and Radiology Groups
- Self-Referral in Diagnostic Radiology
- Marketing a Radiology Practice

The course, directed by Lawrence R. Muroff, M.D., also explores obstacles facing today’s radiology practices—financial issues, strategic planning, billing, compliance, contracts and legal matters—and ways to successfully navigate these challenges.

For more information, contact the RSNA Education Center at (800) 381-6660 x3747 or at ed-ctr@rsna.org.

**PowerRAD 2005**

RSNA is sponsoring a one-day workshop designed for radiologists, radiologic technologists and support personnel. The course, directed by Paul J. Chang, M.D., will be held on **Saturday, August 13, 2005**, at RSNA Headquarters in Oak Brook, Ill.

During this workshop, attendees will learn to convert analog and digital radiology images into electronic formats for presentations, case files and personal teaching files, and to edit images and text using lecture software. RSNA will provide attendees with the use of a desktop computer.

**This course includes:**
- Practical hands-on experience and personalized instructions
- Conference material binder
- CD-ROM software

For more details or to register, go to RSNA.org/education/shortcourses, or contact the RSNA Education Center at (800) 381-6660 x3747 or at ed-ctr@rsna.org.

**RSNA Teaching and Learning Conference**

RSNA hosted a teaching and learning conference in April to discuss the implications of what is currently known about learning and perception in four major spheres in radiology—maintenance of certification, education research, continuing professional development/CME, and self-assessment and assessment by others. The participants were also asked to make recommendations for subsequent RSNA activities, programs and products, based on what was learned during the conference. (clockwise, from left) Gary J. Becker, M.D., Richard B. Gunderman, M.D., Ph.D., and Louise M. Samson, M.D.
content gas mix to simulate the equivalent of 14,000 feet for 30 minutes. This was just enough time to see if there were changes in the subjects’ blood flow without putting them at risk. The technique found the group prone to high altitude pulmonary edema to be the only group where blood flow uniformity changed. Theory proven.

Currently, Dr. Levin and his team are using the technique to tackle objectives 1 through 4. “Now we know what normal blood flow looks like,” said Dr. Levin. “But it’s not enough to generate an image and to say, ‘That looks about normal.’ So, we are working on ways to quantify things so that we can more specifically define what is and is not normal.”

“Lung disease is an insidious intruder,” according to Dr. Levin, who said that the lungs become symptomatic so late in the disease process that it is often difficult to find treatment options. “Once we know what disease looks like, we can detect problems earlier and begin to look at effects of potential therapies.”

Dr. Levin said that while starting with objective 1 might have seemed more logical, his was the right approach. “If I hadn’t had the time and flexibility that the RSNA Research Scholar Grant offered, I might have been forced to just stay with the original plan, to use the techniques that were readily available and to live with their limitations just to get the job done,” he said.

During his career, Dr. Levin has received numerous awards and honors. “David Levin is a unique combination of scholar, researcher and clinician,” said George Leopold, M.D., professor and former chair of the UCSD Department of Radiology. “His demeanor with patients and residents makes him a favorite with all at UCSD, and he has become a much sought-after mentor and confidante. If cloning of humans becomes generally available, he will be our first choice.”

How’s that for a random walk.

Molecular Imaging Summit

Representatives from 15 organizations participated in brainstorming sessions on education, definitions of, and a collaborative organizational framework for molecular imaging. Attendees included radiologists, medical physicists, chemists, nuclear cardiologists, nuclear medicine practitioners and radiopharmaceutical scientists.

The Molecular Imaging Summit, sponsored by RSNA and the Society of Nuclear Medicine, was held in April in Oak Brook, Ill. A feature article will appear in the July issue of RSNA News.

Curiosity about Lung Function Inspires RSNA Research Scholar

Continued from page 22

Continued from previous page

(clockwise, from top left) Brian C. Lentle, M.D., RSNA; Mathew L. Thakur, Ph.D., Society of Nuclear Medicine; Thomas J. Meade, Ph.D., Society for Molecular Imaging; audience; Philip Alderson, M.D., American Board of Radiology; Johannes Czernin, M.D., Academy of Molecular Imaging.
Research & Education Foundation Donors

The Board of Trustees of the RSNA Research & Education Foundation and its recipients of research and educational grant support gratefully acknowledge the contributions made to the Foundation March 30 – April 30, 2005.

For more information on Foundation activities, a quarterly newsletter, Foundation X-aminer, is available online at www.rsna.org/research/foundation/newsletters/x-aminer/x-aminer.pdf.

RSNA MEMBER BENEFITS

Continued from page 21

RadiologyInfo™ Adds New Procedures, Updates Features

Information on more than 80 diagnostic, interventional and radiation therapy procedures are available on RadiologyInfo.org, the patient information Web site cosponsored by RSNA and the American College of Radiology.

Recent additions include:

- Thyroid ultrasound
- Prostate MRI
- Hysterosonography
- Cardiac CT for calcium scoring
- Carotid stenting for stroke prevention

The image gallery is also now available from the home page.

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GOLD ($500 – $999)
Leo Hochhauser, M.D.
Isabel C. Menendez, M.D. & Carlos Martinez-Quinonez

SILVER ($200 – $499)
David J. Balison, M.D.
Ladikpo D.C. Bellow, M.D.
Paula W. Brill, M.D.
Ann G. Archer, M.D. & Anderson Cobb
Edgar Colon, M.D.
Miriam David, M.D.
Drew H. Deutsch, M.D.
Mohamed A. Elshaikh, M.D.
Donna M. Gallagher, M.D.
Bennett S. Greenspan, M.D.
Craig A. Hackworth, M.D.
Lars Hannerz, M.D.
Barbara & Wayne D. Harrison, M.D.
Helen Koselka & Edward S. Horton Jr., M.D.
Hamsaveni & Subbia G. Jagannathan, M.D.
Jan M. Jeske, M.D.
Lorraine & Neil D. Johnson, M.D.
John O. Johnson, M.D.
Janet & Raleigh F. Johnson III, M.D.
Thomas R. Jones, M.D.
Ahmad Judar, M.D.
Joseph A. Kmiecik, M.D., Ph.D.
Gene R. Kovalsky, M.D.
Dawna J. Kramer, M.D. & Monte Kramer

Judy & Mark J. Kransdorf, M.D.
Brian E. Lawner, M.D.
Linda L. Gray, M.D. & Mark Leithe
Stephen F. Miller, M.D.
Tien-Hay Oei, M.D.
Jaime Lopez Ojeda, M.D.
Susan Glazier & Alexander J. Petersen, M.B.B.S.
Richard W. Satre, M.D.
Peter J. Smith, M.B.B.S.
Kowfoworola O. Soyebi, M.B.B.Ch.B. & Gabriel Soyebi
Gregorio M. Tolentino, M.D.
R. Douglas Greally, M.D. & Janice Ugaki
Lorraine Vazquez de Corral, M.D.
Francis W. Willi, M.D.
Dianne & Hirsch Handmaker, M.D.
Helen M. Higgins-Minetti, M.D.
Mary G. Hochman, M.D.
Terumi & Kensuke Itoh, M.D.
Mary Ann & Ferdinand L. Manlio, D.O.
Milton Margulies, M.D.
Carmen M. Martinez, M.D.
Mark A. McGehee, M.D.

COMMEMORATIVE GIFTS
Nancy & Robert E. Campbell, M.D.
In memory of Robert G. Parker, M.D.
Siemens Medical Solutions (www.medical.siemens.com) has received 510(k) FDA clearance to market MammoReportPlus, a mammography softcopy reporting workstation.

The clearance allows Siemens to further develop diagnostic opportunities when dealing with CAD applications and multi-modality viewing. “In fact, MammoReportPlus can accept CAD images from any approved vendor,” said Michael Monahan, vice-president of Siemens’ Special Systems Division.

MammoReportPlus is also now Windows®-based, which allows it to run on syngo®—the intuitive software platform from Siemens that delivers powerful networking and post processing capabilities.

Image Systems Corp. (www.imagesystems corp.com) has updated its Calibration Feedback System© (CFS) with 10 new features and functions.

The new features include graphing capabilities, additional options for automatically logging compliance activities, extended options for look-up table creation and use, comprehensive scheduling capabilities, and security measures to aid in HIPAA compliance.

TOSHIBA America Medical Systems Inc. (www.medical.toshiba.com) has released exclusive software upgrades (v3.5.1) for the Infinix™-i series vascular and cardiac imaging system to enhance the Vitrea® 2 workstation from Vital Images, Inc. (www.vitalimages.com).

Enhancements include advanced 3D bone fusion angiography and imaging functionalities, such as independent control of window/level in separate volumes, dynamic display of 3D volume relative to positioner projection, and the ability to transfer displayed images from the workstation back to the acquisition system. “The new imaging capabilities enabled by the upgrades will not only improve the image quality of bone and vessels, but also [will] offer visualization tools to assist in surgical planning and improve the overall accuracy of interventional procedures,” said Don Volz, director of Toshiba’s Vascular X-Ray Business Unit.

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News about RSNA 2005

Refresher Course Enrollment Begins June 20

Course enrollment information for RSNA 2005 will be mailed in mid-June and will also be available online at rsna2005.rsna.org.

Enrollment is required for various components of the meeting, including refresher courses, infoRAD workshops, hands-on workshops, investment courses and RSNA tours and events. The new “Interventional Oncology Symposium” program also requires registration.

Request a Printed Copy of the RSNA Meeting Program

Beginning in mid-June, RSNA members can request a printed copy of the RSNA Scientific Assembly and Annual Meeting Program. The RSNA Meeting Program is a benefit of membership.

To request your printed copy, go to rsna2005.rsna.org and click on Meeting Program. Members may also call the RSNA Membership and Subscriptions Department at (877) RSNA-MEM [776-2636] (U.S. and Canada) or (630) 571-7873.

Members can choose to have the printed copy mailed to them, or they can pick up the program at the annual meeting.

The deadline to request a printed copy of the RSNA Meeting Program is September 15. Members who do not exercise this Web option will not receive a printed copy in the mail. The content of the RSNA Meeting Program will be available online before, during and after the meeting.

How to Register

There are four ways to register for RSNA 2005:

- Internet
  Go to RSNA.org/register. Use your member ID# from the RSNA News label or meeting flyer sent to you. If you have questions, send an e-mail to rsna@itsmeetings.com.

- Fax
  (24 hours)
  (800) 521-6017
  (847) 940-2386

- Telephone
  (Monday – Friday, 8:00 a.m.–5:00 p.m. CT)
  (800) 650-7018
  (847) 940-2155

- Mail
  ITS/RSNA 2004
  108 Wilmot Rd., Suite 400
  Deerfield, IL 60015-5124
  USA

International Delegates

Invitation Letters

Personalized invitation letters are available at RSNA.org listed under both Annual Meeting and International.

Apply Early for Your Visa!

Visa applicants are advised to apply as soon as they decide to travel to the United States and at least three to four months in advance of their travel date. That means international attendees should start the visa process by July or August.

The following Web sites have additional information on applying for a visa:

- www.unitedstatesvisas.gov
- travel.state.gov/visa
- nationalacademies.org/visas

Earn up to 83 AMA PRA category 1 CME credits at RSNA 2005

Important Dates for RSNA 2005

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tr>
<td>June 20</td>
<td>Course enrollment opens</td>
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<tr>
<td>Oct. 28</td>
<td>Badge mailing deadline for international registrants</td>
</tr>
<tr>
<td>Nov. 7</td>
<td>Final housing deadline</td>
</tr>
<tr>
<td>Nov. 11</td>
<td>Advance registration deadline</td>
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<tr>
<td>Nov. 27–Dec. 2</td>
<td>RSNA 91st Scientific Assembly and Annual Meeting</td>
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</table>
RSNA 2005 Exhibitor News

Exhibitors May Benefit from Union Agreement with McCormick Place

CHICAGO’S McCormick Place, home of the RSNA annual meeting, has announced an agreement with labor unions that could lead to lower costs for exhibitors.

Officials of the Metropolitan Pier and Exposition Authority, which owns and operates McCormick Place, said the agreement addresses many of the major categories of concern for exhibitors, such as expanded hours that unions would be paid straight-time wages and increased flexibility for exhibitors to perform some of their own work. This includes a new rule that allows exhibitors to hang signs and hook up electrical connections without assistance from union personnel.

Mayor Daley called the agreement a start, “We are crawling, and hopefully we will walk and will all run together.”

Important Exhibitor Dates for RSNA 2005

<table>
<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
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<tbody>
<tr>
<td>June 6</td>
<td>Exhibitor block housing point system initiated</td>
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<tr>
<td></td>
<td>Individual exhibitor housing system opens</td>
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<tr>
<td>June 28</td>
<td>Exhibitor Planning/Booth Assignment Meeting</td>
</tr>
<tr>
<td>July 5</td>
<td>Technical Exhibitor Service Kit available online</td>
</tr>
<tr>
<td>July 6</td>
<td>Block Housing deadline date</td>
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<tr>
<td>July 29</td>
<td>Deadline for reduction/cancellation (for full refund)</td>
</tr>
<tr>
<td>August 12</td>
<td>Deadline for final payment</td>
</tr>
<tr>
<td>August 29</td>
<td>Deadline for reduction/cancellation (for partial refund)</td>
</tr>
<tr>
<td>August 15</td>
<td>Deadline to submit Block Housing room deposits</td>
</tr>
<tr>
<td>August 26</td>
<td>Headquarters Office Space Assignments close</td>
</tr>
<tr>
<td>Nov. 4</td>
<td>Exhibitor advance badge request deadline</td>
</tr>
<tr>
<td>Nov. 27–Dec. 2</td>
<td>RSNA 91st Scientific Assembly and Annual Meeting</td>
</tr>
</tbody>
</table>

Technical Exhibitor Service Kit

The RSNA 2005 Technical Exhibitor Service Kit will be available beginning July 5 at rsna2005.rsna.org. Click on the Service Kit link in the Technical Exhibition area on the right.

The exhibitor contact will be sent a password to the site to download service request forms and easily find important information such as registration hours, exhibit installation and dismantling hours, rules and regulations, RSNA forms and official contractor information.

The electronic kit also will allow online ordering capabilities with some contractors.

Advertising at RSNA 2005

Many opportunities exist for companies to promote their exhibit at RSNA 2005—the world’s largest annual medical meeting. For more information, go to www.rsna.org/advertising/index.html or contact:

- **Jim Drew**
  Director of Advertising
  (630) 571-7819
  jdrew@rsna.org

- **Judy Kapicak**
  Senior Advertising Manager
  (630) 571-7818
  jkapicak@rsna.org

June Exhibitor Planning Meeting

Booth assignments will be released on June 28 at the Exhibitor Planning Meeting and Luncheon. All exhibitors for RSNA 2005 are invited to attend the meeting at Rosewood Restaurant and Banquets near Chicago’s O’Hare International Airport. An e-mail invitation was sent to all confirmed 2005 exhibitors in mid-May.

For more information, contact RSNA Technical Exhibits at (800) 381-6660 x7851 or e-mail: exhibits@rsna.org.
RSNA.org

Latest News About RSNA 2005


You can register for the meeting ➊ or see what’s new to this year’s program ➋.

Beginning June 20, you can view the refresher course program and register for courses ➌.

The left-hand navigation bar will be updated as we get closer to the meeting to include the RSNA Meeting Program, Tours & Events, Exhibitor List and other important information.

Other Web Tutorials Available in RSNA News

These tutorials are available in html or PDF format.

How to...
- Update Your Member Profile . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . September 2004
- Use RSNA’s Medical Imaging Resource Center . . . . . . . . . . . November 2004
- Navigate the Education Portal . . . . . . . . . . . . . . . . . . . . . . . . . . December 2004
- Use the RSNA Membership Directory . . . . . . . . . . . . . . . . . . . . January 2005
- Register and Use the CME Gateway . . . . . . . . . . . . . . . . . . . . . February 2005
- Renew Your RSNA Membership . . . . . . . . . . . . . . . . . . . . . . . . March 2005
- Access Scientific Posters and Education Exhibits . . . . . . . . . April 2005
- Use RSNA Career Connections . . . . . . . . . . . . . . . . . . . . . . . . . . May 2005

Other Web Tutorials
- RSNA.org
  - www.rsna.org
- Radiology Online
  - rsna.org/radiology/
- Radiology Manuscript Central
  - rsna.org/radiology/submit
- Radiographics Online
  - rsna.org/radiographics
- RSNA News
  - rsnanews.org
- Education Portal
  - rsna.org/education
- CME Credit Repository
  - rsna.org/cme
- CME Gateway
  - CMEgateway.org
- RSNA Medical Imaging Resource Center
  - rsna.org/mirc
- RSNA Career Connections
  - rsna.org/careers
- RadiologyInfo
  - RSNA-ACR patient information
    - Web site radiologyinfo.org
- RSNA Press Releases
  - rsna.org/media
- RSNA Online Products and Services
  - rsna.org/memberservices
- RSNA Research & Education Foundation
  - Make a Donation
    - rsna.org/donate
- Community of Science
  - rsna.org/cos
- Membership Applications
  - rsna.org/mbrapp
- RSNA Membership Directory
  - rsna.org/directory
- Register for RSNA 2005
  - rsna.org/register
- RSNA 2005
  - rsna2005.rsna.org

Online registration produces an instant confirmation.
# Medical Meetings
## July – October 2005

### July 17–30
Federación Mexicana de Radiología e Imagen (FMRI), National Meeting on Breast Imaging, Acapulco, Mexico
- [www.fmri.org.mx](http://www.fmri.org.mx)

### July 24–28

### July 29–31

### August 1
American Society of Interventional & Therapeutic Neuroradiology (ASITN), 2nd Annual ASITN Course & Workshops, Turtle Bay Resort, Oahu, Hawaii • [www.asitn.org](http://www.asitn.org)

### August 11–14
Clinical Magnetic Resonance Society (CMRS), 2005 Annual Society Meeting, Vail Cascade Resort & Spa, Vail, Colo.
- [www.cmrs.com](http://www.cmrs.com)

### September 7–10
Society for Molecular Imaging (SMI), 4th Annual Meeting, Gürzenich Congress Center, Cologne, Germany
- [www.molecularimaging.org](http://www.molecularimaging.org)

### September 10–14
Cardiovascular and Interventional Society of Europe (CIRSE), Annual Meeting and Postgraduate Course, Nice Acropolis, Nice, France • [www.cirse.org](http://www.cirse.org)

### September 14–17
International Organization for Medical Physics (IOMP), 14th International Conference of Medical Physics, 9th European Congress of Medical Physics, 64th Annual Meeting of the German Society of Medical Physics (DGMP), 39th Annual Meeting of the German Society for Biomedical Engineering, Congress-Center Nürnberg, Germany • [www.icmp2005.org](http://www.icmp2005.org)

### September 14–17
Sociedad Mexicana de Radiología e Imagen, IV Annual Ultrasound Course, Hotel Sheridan Maria Isabel, Mexico City
- [www.smri.org.mx](http://www.smri.org.mx)

### September 15–17
*Journal of the American Medical Association (JAMA), British Medical Journal (BMJ)*, 5th International Congress on Peer Review and Biomedical Publication, Fairmont Hotel, Chicago
- [www.jama-peer.org](http://www.jama-peer.org)

### September 21–24
American Society of Head and Neck Radiology (ASHNR), 39th Annual Meeting, Renaissance Parc 55 Hotel, San Francisco
- [www.ashnr.org](http://www.ashnr.org)

### September 21–24
American Society of Emergency Radiology (ASER), Annual Meeting and Postgraduate Course, Westin La Paloma Resort and Spa, Tucson, Ariz. • [www.erad.org](http://www.erad.org)

### September 22–24

### September 25–28

### September 28–October 1

### September 29–October 2
Canadian Association of Radiology (CAR), 68th Annual Scientific Meeting, Fairmont Château Lake Louise, Alberta, Canada • [www.car.ca](http://www.car.ca)

### October 5–8
II Iberian Forum on Telemedicine: Teleradiology in the Digital Era, Expoveiras, Viseu, Portugal • [www.fitelemed.org](http://www.fitelemed.org)

### November 27–December 2