

RSNA *News*

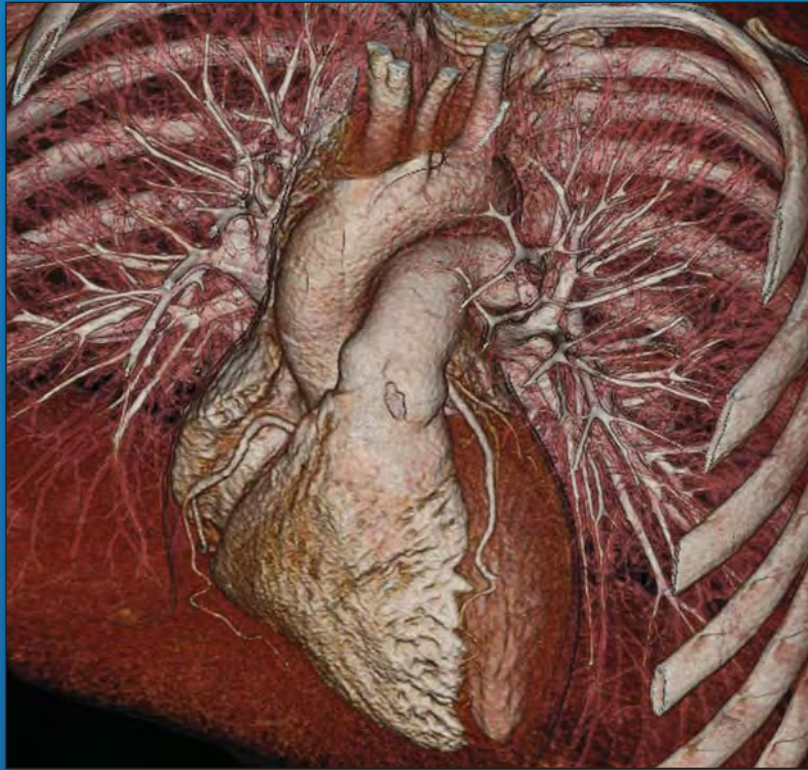


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Cardiac CT is Accurate, Saves Time and Money

Also Inside:

- RSNA Research Resident Harnesses Power of Optical Imaging for Customized Care
- MR Outperforms CT as Stroke Diagnosis Standard
- Filling Radiology's Leadership Void is Goal of New RSNA Course
- Digital Imaging Illuminates Question of Ideal Room Lighting

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RSNA News

May 2007 • Volume 17, Number 5

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

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*.

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Oak Brook, IL 60523

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RSNA *Daily Scan* Launched

A DAILY electronic news briefing, *The Daily Scan*, is now offered as a benefit of RSNA membership. Offered in collaboration with the respected news organization *U.S. News & World Report*, the e-mail briefing summarizes developments of potential interest to RSNA members, covering such topics as radiology research, patient safety and technology.

The daily news briefing is e-mailed early each weekday morning to the

e-mail address the member has on file with RSNA.

To ensure *The Daily Scan* reaches their inbox each morning, members should add DailyScan@rsna.custombriefings.com to their e-mail address book. Members may opt out at any time by following simple instructions included with each day's briefing.

RSNA wants to make this new benefit as useful as possible. Members are encouraged to submit feedback via a link included in every briefing.



ABR Announces Hattery Retirement

Robert R. Hattery, M.D., will step down at the end of this year from his post as executive director of the American Board of Radiology. Dr. Hattery, who is also RSNA's immediate past-president, said the move reflects his overall retirement planning.

During five years with the ABR, Dr. Hattery guided the organization's significant reorganization and expansion as it focused on developing maintenance of certification programming, establishing the ABR Foundation and moving to a new building and staff office complex in Tucson, Ariz.

The ABR Board of Trustees has established a search committee, directed by Glenn Forbes, M.D., to name a new executive director this fall. More information about the position is available by e-mailing EDSearch@theabr.org.



Robert R. Hattery, M.D.

IHE® Launches Quality Domain

A new domain of the Integrating the Healthcare Enterprise (IHE®) initiative addresses the infrastructure necessary to share information regarding quality improvement in electronic health records. RSNA, American College of Cardiology, American Heart Association and Healthcare Information and Management Systems Society sponsor the new domain. More information is available at www.ihe.net/quality/index.cfm.



Alliance for MRI Anticipates Meeting with European Parliament

The Alliance for MRI, founded in March in response to European Union-adopted legislation to prevent adverse health effects in workers with short-term exposure to electromagnetic fields, will share its concerns about the law's impact in a face-to-face meeting with the European Parliament next month.

The European Society of Radiology (ESR) was a founding member of the Alliance for MRI, which also includes members of the European Parliament, patient groups, scientists and medical professionals. In a release, ESR asserted that the original impact assessment of the legislation did not cover economic and social consequences.

The directive will introduce unintended restrictions on MR imaging use and have a serious impact on healthcare provision and patient welfare, according to ESR, making it more difficult for healthcare staff to look after patients who need help during scanning and ending the use of MR imaging for surgical procedures.

Insisting that any decision to curtail the use of MR imaging be based on up-to-date scientific evidence, the Alliance for MRI has asked specifically that national authorities be informed of the legislation's unintended consequences, that implementation be delayed to await the results of a new impact assessment and that an amendment to the directive allow for MR imaging.

MEDICAL IMAGING COMPANY NEWS

GE Healthcare Helps UNC Establish Breast Cancer Imaging Center

■ GE Healthcare of Chalfont St. Giles, United Kingdom, has signed a multiyear agreement with the University of North Carolina (UNC) at Chapel Hill to establish a Center for Research Excellence in Breast Cancer Imaging within the university's Biomedical Research Imaging Center. With GE's funding, the center will undertake projects such as evaluating the role of contrast-enhanced mammography in breast cancer diagnosis and developing mechanisms to reduce radiation dose to patients who undergo mammography. The director of the center will be Etta D. Pisano, M.D., Kenan Professor of Radiology and Biomedical Engineering and former chief of breast imaging at UNC.

FDA Accepting Input on Tighter Guidelines for Advisory Committee Membership

The U.S. Food and Drug Administration (FDA) will accept input through May 21 on its more stringent guidelines for considering potential conflicts of interest among advisory committee members and recommending eligibility for meeting participation.

FDA currently screens all prospective advisory committee participants before each meeting to determine



whether the potential for a financial conflict of interest exists and may grant a waiver when certain criteria are met. Attempting to reduce the likelihood that the process of recommending waivers would vary from meeting to meeting, the new guidance defines more levels of financial conflict of interest and the implications of each.

To submit electronic comments on

the draft guidance, visit www.fda.gov/dockets/ecomments and select Docket ID 2007D-0101. FDA has also launched a Web page dedicated to improving recruitment of advisory committee members and enhancing public participation in the process. For more information, go to www.fda.gov/oc/advisory/.

PEOPLE IN THE NEWS

Hip Society Names Potter as First Radiologist Member

Hollis G. Potter, M.D., chief of the MR imaging division in the Department of Radiology and Imaging at the Hospital for Special Surgery in New York and internationally recognized for her expertise in developing MR applications for orthopedic conditions, is the first radiologist and first female to be named to the Hip Society. Founded in 1968, the Hip Society is dedicated to the advancement of knowledge relating to the hip joint.

Studying the effectiveness of MR imaging in total joint replacements, Dr. Potter has adjusted scanning parameters to enable physicians to earlier diagnose and treat impending complications. She is also studying the use of MR to image degenerative changes in cartilage, an early indicator of osteoarthritis.

Grossman Named to Top Post at NYU Medical Center

Robert I. Grossman, M.D., has been named dean of the New York University (NYU) School of Medicine. Dr. Grossman, the Louis Marx Professor of Radiology, chair of the Department of Radiology and professor of neurology, neurosurgery and physiology and neuroscience, has also been named CEO of NYU Hospitals Center. He will assume the new positions on July 1.

Dr. Grossman joined NYU in 2001 from the Hospital of the University of Pennsylvania in Philadelphia, where he was a professor of radiology, neurosurgery and neurology as well as associate chair of radiology and chief of neuroradiology.

Dr. Grossman was awarded the Javits Neuroscience Investigator Award by the National Institutes of Health in 1999 for his work on multiple sclerosis. He is currently president of the American Society of Neuroradiology and editor-in-chief of the *American Journal of Neuroradiology*.



Robert I. Grossman, M.D.

RSNA Educational Scholar Pens Book on Medical Education Excellence

A new book by **Richard Gunderman, M.D., Ph.D., M.P.H.**, associate professor of radiology, pediatrics, medical education, philosophy, liberal arts, and philanthropy at Indiana University Purdue University Indianapolis (IUPUI), looks at the vision for excellence in medical education and training in the U.S.

Among the topics examined in "Achieving Excellence in Medical Education"—hailed in a *Journal of the American Medical Association* review as "eloquent, quotable and inspirational"—are education as a priority of medical schools and best practices of medical educators and learners.

Vice-chair of the Depart-

ment of Radiology at IUPUI and director of the Department of Pediatric Radiology at Riley Hospital for Children, Dr. Gunderman serves on the RSNA Professionalism Committee and received an RSNA Research & Education Foundation Educational Scholar Grant in 2000.



Richard Gunderman, M.D., Ph.D., M.P.H.

ACR Honors Three Physicians

1993 RSNA President **Thomas S. Harle, M.D.**, who last month received the gold medal of the Texas Radiological Society, will receive the gold medal of the American College of Radiology (ACR) this month.

Dr. Harle is the Isadore Meschan Distinguished Professor of Radiology at Wake Forest University School of Medicine in Winston-Salem, N.C. He is past-president of the American Registry of Radiologic Technologists, Association of University

Radiologists, Texas Radiological Society and Houston Radiological Society.

Also receiving the ACR gold medal is **Sarah S. Donaldson, M.D.**, RSNA Board Liaison for Publications and Communications. Dr. Donaldson is associate chair of the Department of Radiation Oncology, deputy clinic chief and residency program director for radiation oncology at Stanford University Medical Cen-



Thomas S. Harle, M.D.



Sarah S. Donaldson, M.D.



E. Stephen Amis, M.D.

ter in Stanford, Calif. She is also the Catharine and Howard Avery Professor of Radiation Oncology at Stanford University School of Medicine.

E. Stephen Amis, M.D.,

chair of the Department of Radiology at Albert Einstein College of Medicine in New York and former ACR board chair and president, will also receive the ACR gold medal.

Camacho to Head New Emergency Radiology Section

Beth Israel Deaconess Medical Center (BIDMC) in Boston has named **Mark A. Camacho, M.D.**, as chief of the newly established section of emergency radiology in the Department of Radiology.

Dr. Camacho, an instructor at Harvard Medical School, is an expert in trauma imaging, CT angiography and CT utilization practices. At BIDMC, he will expand emergency radiology services to include round-the-clock imaging by attending radiologists for the hospital's Berenson Emergency Department, a Level I trauma center.



Mark A. Camacho, M.D.

Canadian Society Honors Lentle

The Canadian Society of Nuclear Medicine presented 2004 RSNA President **Brian C. Lentle, M.D.**, with the Emeritus Award during its annual meeting this month. The Emeritus Award is the society's highest honor.

Dr. Lentle is a professor emeritus and former head of the Department of Radiology at the University of British Columbia in Vancouver. He currently serves as secretary of the RSNA Research & Education Foundation Board of Trustees.



Brian C. Lentle, M.D.

IN MEMORIAM:

Saroja Adusumilli, M.D.

Saroja Adusumilli, M.D., recently selected to receive an RSNA Research & Education Foundation Educational Scholar Grant, died March 3 from injuries suffered in an automobile accident. She was 26.

Clinical assistant professor of radiology at the University of Michigan (U-M) in Ann Arbor, Dr. Adusumilli also completed her radiology residency at U-M and was elected chief resident in 2000. She received the Excellence in Teaching Award from

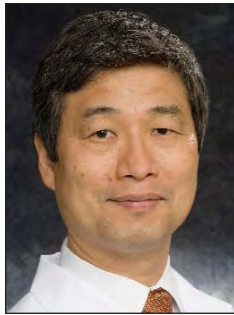
U-M radiology residents in 2004 and was associate director of the department's residency program.

"Dr. Adusumilli was an outstanding clinical radiologist, an excellent teacher and a gifted investigator," said N. Reed Dunnick, M.D., Fred Jenner Hodges Professor and chair of the Department of Radiology at U-M and RSNA Board Liaison for Science.



Saroja Adusumilli, M.D.

Dr. Adusumilli was active with RSNA, the Association of University Radiologists, American Roentgen Ray Society and American Board of Radiology. She received her bachelor's and medical degrees from Case Western Reserve School of Medicine in Cleveland and completed a fellowship in MR imaging at the University of Pennsylvania in Philadelphia.



Chul Soo Ha, M.D.

UT Health Science Center Appoints Ha Radiation Oncology Chair

Chul Soo Ha, M.D., is the new chair of the Department of Radiation Oncology at the University of Texas Health Science Center at San Antonio. Dr. Ha is also Radiation Oncology Director at the Cancer Therapy & Research Center and a professor of radiation oncology.

Previously at M.D. Anderson Cancer Center in Houston, Dr. Ha served as medical director of the Radiation Treatment Center, associate director of the Multidisciplinary Lymphoma Center and professor of radiation oncology. He is immediate past-chair of the Radiation

Oncology and Radiobiology Subcommittee of the RSNA Scientific Program Committee.



Send news about yourself, a colleague or your department to rsnanews@rsna.org, 1-630-571-7837 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.

MY TURN

My ECR 2007 Experience

“**B**EAUTIFUL,” “Outstanding” and “Fantastic” describe the city of Vienna; the meeting at the Austria Center, Vienna; and the hospitality, respectively, as I experienced them when attending the European Congress of Radiology (ECR) meeting, March 9–13, 2007.

Vienna is truly a beautiful city, replete with culture and impressive architecture. The citizens are friendly, and one feels a sense of “safeness” when walking. As aptly stated by ECR 2007 President Christian J. Herold, M.D., “ECR and Vienna offer a huge variety of cultural events, sophisticated entertainment and culinary delights.”

I first attended the ECR meeting in 1993 as a course faculty member. Since then, the meeting has undergone marked expansion—to more than 17,000 participants representing 94 countries, 270 scientific and educational sessions and 1,700 accepted proffered papers and exhibits this year. I participated in a special focus session, “Ask the editors: Discuss your most

burning questions and problems with the editors of the major international radiologic journals.” With President Herold presiding, it was my honor to share the podium with Editors Albert L. Baert,

M.D., Ph.D. (*European Radiology*), and Robert J. Stanley, M.D. (*American Journal of Roentgenology*). We each gave a brief presentation about our respective journals, followed by a question and answer period moderated by Geoffrey D. Rubin, M.D., and Majda M. Thurnher, M.D. There were many insightful and pertinent questions relating to duplicate publication, resubmission policies, reviewer evaluation, variance among reviewer recommendations, reviewer assignment, author options for a rejected manuscript and others. I believe members of the audience were gratified to see that the three journals share some similar approaches, although they are different enough to



Anthony V. Proto, M.D.

make each a unique publication vehicle. The editors were gratified by the audience interest, with questions still remaining at the end of the session.

Last, the hospitality was truly fantastic. ECR President Herold and European Society of Radiology President Nicholas C. Gourtsoyiannis, M.D., Ph.D.,

were most gracious. Numerous events were attended by both speakers and registrants, providing an enjoyable atmosphere of collegiality. In short, if you attend a future meeting, I predict you will enjoy the city, the meeting and the hospitality. The 2008 meeting will be held again in Vienna, March 7–11, with Maximilian F. Reiser, M.D., from Munich, Germany, as president.

Anthony V. Proto, M.D., has been editor of Radiology since 1998. He will leave the post at the end of 2007.

My Turn

ONE RADIOLOGIST'S VIEW

Board of Directors Report

QUANTITATIVE imaging and personal learning tools were two of the key topics at the January RSNA Board retreat and March Board meeting. These issues are significant in RSNA's commitment to patient care through education and research.

Quantitative Imaging

Biomarkers—identifying them, understanding them and using them to personalize diagnosis and treatment—are the future of medicine. Molecular imaging probes are extremely important tools because they provide images of specific molecular pathways and key targets in vivo. They enable us to see biochemical and physiologic abnormalities, rather than the structural consequences of the abnormalities.

RSNA will play an increasingly important role in advancing the science of quantitative imaging and in educating our members and the medical community about how to use quantitative imaging to benefit patients.

Over the past two years, the Society has convened meetings with imaging biomarker stakeholders, hosted scientific sessions at our annual meeting and launched new initiatives in molecular imaging. RSNA is co-hosting a molecular imaging workshop in September and is supporting related efforts at the National Cancer Institute and National Institute of Biomedical Imaging and Bioengineering through our Medical Imaging Resource Center (MIRC™), radiology lexicon project (RadLex®) and Integrating the Health-

care Enterprise (IHE®) initiative.

These types of activities will continue. In addition, the Society became a contributing member of The Biomarkers Consortium, a public-private partnership to advance knowledge about specific biomarkers and their clinical applications. The RSNA Department of Research will also expand to include a physician science advisor, Daniel Sullivan, M.D., to oversee and coordinate all biomarker efforts. The new department will be called the RSNA Department of Scientific Affairs. More information will be available in future editions of *RSNA News*.

Personal Learning Tools

Another major undertaking for RSNA is developing learning tools that members can personalize for maximum effectiveness. The Society plans to offer members mechanisms by which they will be able to readily access, store and share educational content—including lectures, teaching cases, images, journal articles, exhibits and other useful reference material—relevant to their own interests and practice needs through a variety of media.

Some of these tools are already available in the maintenance of certification (MOC) section of *RSNA.org/education*. New tools planned for 2007 include the ability to customize the RSNA Web page to display content of specific interest to the user member. *MyRSNA.org* will be similar to offerings by Yahoo!® and Google™ in that



Gary J. Becker, M.D.
Chairman, 2007 RSNA Board of Directors

members will be able to decide the content and services they want displayed each time they go to the RSNA Web site.

For example, a physician specializing in neuroradiology may choose the latest neuroradiology articles in *Radiology* and *RadioGraphics* to be displayed, along with the latest online courses and self-assessment modules in neuroradiology.

Other tools, including one specifically intended to help radiology residents create and maintain the personal learning log now required by the Accreditation Council for Graduate Medical Education, will also be unveiled. More information will be available in future editions of *RSNA News*.

RSNA 2007

Registration for RSNA 2007 opened a few weeks ago and course registration will open June 18. The Board is pleased with new course offerings planned for the annual meeting and

Continued on next page

RSNA will play an important role in advancing the science of quantitative imaging and in teaching the medical community how to use it to benefit patients.

Gary J. Becker, M.D.

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updates that will be made to the most popular mainstays.

The new Task Force on Oncologic Imaging and Therapies helped develop a program for RSNA 2007 that reflects the increasing need for radiologists, radiation oncologists and other specialists to work more closely together. A four-day Bolstering Oncoradiologic and Oncoradiotherapeutic Skills of Tomorrow (BOOST) program will be offered under the direction of Steven A. Leibel, M.D., and David M. Panicek, M.D. A feature article about BOOST will appear in the June issue of *RSNA News*, as will the names of the RSNA 2007 gold medalists, honorary members and honored lecturers.

Other new features at RSNA 2007 include a one-day series course on quality improvement; a one-day series course on molecular imaging; half-day series courses in gastrointestinal, musculoskeletal and neuroradiology; a five-afternoon interventional oncology series; and a one-day mentored cardiac CT case review.

RSNA Highlights™

RSNA members who attended the Society's first RSNA Highlights™ con-



RSNA Highlights™ 2008 will be held Feb. 18-20 at the Ritz-Carlton/JW Marriott Orlando in Grande Lakes, Fla.

ference in Phoenix were extremely pleased with the intimate environment and superb, cutting-edge course content. (See the article in the April issue of *RSNA News*.)

For 2008, RSNA Highlights will be held February 18-20 in Orlando, Fla. Course topics emphasize cardiac, thoracic, head and neck and breast imaging.

Media Relations Program

A comprehensive review of RSNA



The 16 press conferences held during RSNA 2006 included one featuring Carlos S. Restrepo, M.D., who discussed his study of outcomes in individuals undergoing illegal silicone injections.



RSNA 2007
CONNECTING RADIOLOGY
93rd Scientific Assembly
and Annual Meeting
November 25-30, 2007
Chicago

media relations activities over the past five years has shown a substantial increase in placements. Media coverage of RSNA and of radiology research featured at the RSNA annual meeting and in *Radiology* rose from 3,069 placements reaching a potential audience of 1.2 billion people in 2002 to 7,835 placements reaching a potential audience of nearly 7.8 billion in 2006.

The Board is confident that this increased coverage has helped the media and the public understand more about the role of radiologists and medical imaging in their healthcare. Recent additions to the public information initiatives, including radio public service announcements, video news releases and a 60-second check-up radio program, will help to further increase awareness.

International Visiting Professor Destinations

The Board approved recommendations from the RSNA Committee on International Relations and Education for the host societies for the 2008 International Visiting Professor (IVP) program. They

are the Chinese Society of Radiology, Vietnamese Society of Radiology and Association of Radiologists of West Africa. A similar IVP program is held each year in Mexico.

RSNA Strategic Plan

The Board annually reviews and revises the Society's strategic plan. Committee chairs are invited to provide input. The 2007-2010 RSNA Strategic Plan is available on *RSNA.org* under About RSNA.

GARY J. BECKER, M.D.

CHAIRMAN, 2007 RSNA BOARD OF DIRECTORS

■ Note: In our continuing efforts to keep RSNA members informed, the chairman of the RSNA Board of Directors will provide a brief report in *RSNA News* following each board meeting. The next RSNA Board Meeting is in June 2007.

Cardiac CT is Accurate, Saves Time and Money

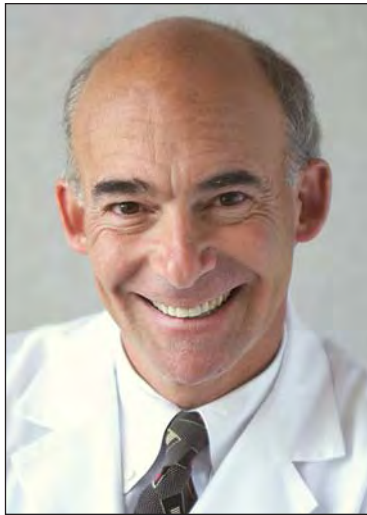
TWO NEW studies spotlighting multislice CT as a relatively quick and inexpensive way to determine whether heart disease is causing acute chest pain have physicians tempering their excitement with caution.

“I believe we need to be careful so that not everyone in the periphery, who may not be associated with an academic center, tries to start doing this right away,” said U. Joseph Schoepf, M.D., co-presenter of the “Essentials of Cardiac Imaging” refresher course at RSNA 2006 and an associate professor of radiology and medicine at the Medical University of South Carolina in Charleston.

Studies looking at the safety and efficacy of using CT coronary angiography to diagnose patients presenting with chest pain in the emergency room appeared in the Feb. 27, 2007, issue of the *Journal of the American College of Cardiology (JACC)* and the February issue of *Academic Emergency Medicine (AEM)*.

In the *JACC* study, researchers found CT of the heart can quickly yield evidence of fatty blockages or calcium deposits in the coronary arteries—evidence that heart disease is causing the patient’s chest pain.

Led by James Goldstein, M.D., director of research and education in the division of cardiology at William Beaumont Hospital in Royal Oak, Mich., researchers wanted to see if multislice CT of the heart could make the evaluation of chest pain more efficient and less costly, allowing emergency physicians to send home patients with normal coronary arteries while accurately identifying those patients who needed further study or admission to the hospital.



James Goldstein, M.D.
William Beaumont Hospital



U. Joseph Schoepf, M.D.
Medical University of South Carolina

CT Images Extolled as Amazing

Dr. Goldstein and colleagues studied 197 patients suffering from heart attack-like chest pain but no history of heart disease. In all patients, initial blood tests and electrocardiogram (ECG) results used to detect damage were normal, both initially and in subsequent testing repeated four hours later. The team then randomly assigned half the patients to undergo CT and the others to a standard diagnostic plan that included additional rounds of ECG and blood testing plus a nuclear scan of the heart.

The 64-slice CT scanner utilized by the team, said Dr. Goldstein, provided “amazing pictures of the heart.”

“In the vast majority of individuals, CT produces extremely high-resolution images,” Dr. Goldstein said. “It’s excellent at determining the presence or absence of disease and if disease is present, we’ve shown it can determine

the degree of severity—mild, moderate or more severe.”

Multislice CT first uses X-rays to measure the amount of calcium in the arteries supplying blood to the heart. Then, after intravenous injection of contrast medium, CT creates detailed pictures of the heart and coronary arteries in minutes. A nuclear scan is a two-part test using radioactive material to measure blood flow to the heart while patients are at rest and

then again during stress. By definition, nuclear scanning takes longer than CT.

Dr. Goldstein and colleagues found CT alone pinpointed heart disease as the cause of chest pain, or reliably ruled out that possibility, in 75 percent of patients. The remaining 25 percent underwent a nuclear scan in addition to the CT. The cost and time involved in reaching a diagnosis were significantly lower in the CT group—costs averaged

In the vast majority of individuals, CT produces extremely high-resolution images.

James Goldstein, M.D.

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\$1,586 per patient versus \$1,872 for the standard diagnostic evaluation, including the nuclear scan.

Cost Savings Also Focus of Emergency Department Study

Judd E. Hollander, M.D., lead author of the *AEM* study, said that of the 6 to 8 million patients seen in emergency departments each year for chest pain, only about 15 percent turn out to have acute coronary syndrome. "We admit 60 to 65 percent of these patients, the majority of whom turn out to have nothing seriously wrong with them," said Dr. Hollander, M.D., clinical research director and professor of emergency medicine at the Hospital of the University of Pennsylvania in Philadelphia.

"What I refer to as the holy grail is finding a test or battery of tests that can save those admissions because they liter-

ally cost billions of dollars annually," he added.

Of the 54 patients evaluated by Dr. Hollander and colleagues, 46 (85 percent) were immediately released from the emergency department following CT coronary angiography. None had complications within 30 days. Eight patients were admitted based on CT coronary angiography results.

Researchers concluded that for patients with low-risk chest pain, CT

angiography may safely allow for a rapid discharge of patients with negative studies. Dr. Hollander said that while he anticipates that CT will eventually become part of everyday practice in emergency rooms, the published data

ON THE COVER 3D volume rendering of chest in 52-year-old female with acute chest pain, dyslipidemia and positive family history for coronary artery disease.

The patient had normal electrocardiogram (ECG) and negative biomarkers upon presentation in the acute chest pain unit. She underwent a contrast-enhanced, low-radiation-dose, retrospectively ECG-gated scan of the entire chest using a 64-slice CT scanner. CT showed unremarkable thoracic anatomy, without evidence of pulmonary embolism, acute aortic syndromes or coronary atherosclerosis.

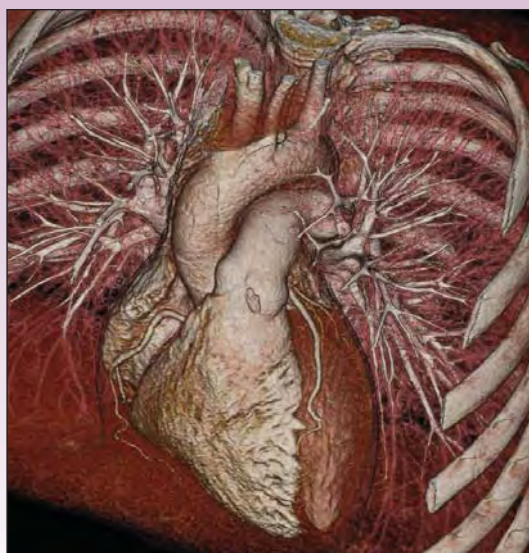


Image courtesy of U. Joseph Schoepf, M.D., Medical University of South Carolina

are too few to allow a general recommendation just yet.

"But there's at least observational data that it is likely to be a very successful approach," he said.

Dr. Goldstein also cautioned about the limitations. CT isn't appropriate if a patient is already known to have coronary artery disease, he said, and it's also not appropriate in cases of very obese patients where the images are not clear enough. In terms of radiation exposure risk to patients, he said, clinicians are steering away from using the technique in women under 40 years of age, in whom exposure of breast tissue should be minimized.

"As for others, the overall radiation risk from this CT angiography exposure is small," said Dr. Goldstein.

Dr. Schoepf said cardiac CT will evolve as multicenter trials like Coronary Computed Tomography for Sys-

tematic Triage of Acute Chest Pain Patients to Treatment (CT-STAT) provide data. CT-STAT will soon begin enrolling patients in 15 hospitals.

Technology is also quickly changing, said Dr. Schoepf, pointing to a University of Maryland study published in the August 2005 issue of the *American Journal of Roentgenology*, in which researchers studied the efficacy of 16-slice multidetector CT in chest pain evaluation.

"Now, just two years later, we are working with dual source scanner types," said Dr. Schoepf. "You can now scan twice as fast as you could with the traditional 16-slice CT. Everybody's very excited about the advent and utilization of that technique, particularly for acute chest pain." □

Learn More

More information about the studies cited in this article is available online.

■ "A Randomized Controlled Trial of Multi-Slice Coronary Computed Tomography for Evaluation of Acute Chest Pain" content.onlinejacc.org/cgi/content/abstract/49/8/863

■ "Computed Tomography Coronary Angiography for Rapid Disposition of Low-risk Emergency Department Patients with Chest Pain Syndromes" www.aemj.org/cgi/content/abstract/14/2/112

■ "Chest Pain Evaluation in the Emergency Department: Can MDCT Provide a Comprehensive Evaluation?" www.ajr.org/cgi/content/abstract/185/2/533

Cardiac CT at RSNA 2007

M ENTORED Cardiac CT Case Review is a new course to be offered at RSNA 2007. Registration for this and all RSNA 2007 courses begins June 18. More information about Mentored Cardiac CT Case Review, offered in conjunction with the North American Society for Cardiac Imaging (NASCI), will be available at RSNA2007.RSNA.org and in future issues of *RSNA News*.



RSNA 2007
CONNECTING RADIOLOGY
93rd Scientific Assembly
and Annual Meeting
November 25-30, 2007
Chicago

MR Outperforms CT in Stroke Diagnosis But Practicality Issues Remain

AUTHORS of a recently published study comparing non-contrast MR imaging to the standard non-contrast CT in diagnosing stroke said their findings clearly establish MR as the preferred test.

Critics of the study, on the other hand, said the purpose of CT in most stroke patients is to quickly diagnose hemorrhage, not ischemic stroke. Substituting MR for CT in most hospitals would cause a delay in stroke therapy,

where the opportunity for effective treatment is brief, critics said.

Comparing the two modalities in 356 patients with suspected stroke, researchers found MR

imaging particularly vital in diagnosing ischemic stroke. MR imaging even revealed small, early strokes—noteworthy given that mild strokes can be difficult to diagnose, said senior investigator Steven Warach, M.D., Ph.D.

“The experts reading the scans found five times the number of ischemic strokes through MR imaging than through CT,” said Dr. Warach, chief of the Stroke Diagnostics and Therapeutics Section at the National

Institute of Neurological Disorders and Stroke (NINDS), a part of the National Institutes of Health. Study results were published in the Jan. 27, 2007, issue of *The Lancet*.

Accessible and Cost-Effective CT is the Standard

To date, non-contrast CT has been the standard for diagnosis in emergency cases of suspected stroke, due in large part to its supporting role in the proven

Radiologists need to . . . develop fast, comprehensive imaging strategies.

Howard Rowley, M.D.

therapy for patients with an acute ischemic stroke—intravenous tissue plasminogen activator (tPA) administered within the first three hours after symptom onset. The NINDS and Stroke rt-PA Stroke Study Group, which studied patients with clinical symptoms of stroke who underwent CT scans to exclude hemorrhage, established that the shorter the time to treatment, the better patients do. Results were published in the Dec. 14, 1995, issue of *The New England Journal of Medicine*.

In addition, CT is generally more accessible for emergency use, even in facilities where MR imaging is available, and its fixed and variable costs tend to be less than those of MR imaging.

Previous studies showing the differences between MR imaging and CT, said Dr. Warach, were limited by the fact that the patients had already been diagnosed with a stroke. “In the real world, patients who go to the hospital with stroke symptoms may or may not have had a stroke,” he said. “In fact, 25



Steven Warach, M.D., Ph.D.
National Institute of Neurological Disorders and Stroke

percent of those who go to the emergency department with stroke symptoms have not had a stroke.”

MR Readings Unanimous in 80 Percent of Acute Stroke Cases

Dr. Warach and colleagues conducted their study at Suburban Hospital, a private community hospital in Bethesda, Md.

MR imaging was conducted prior to CT in 304 of the 356 patients. The authors did not randomize the order of scanning, noting such a requirement would have necessitated clinically unjustifiable delays in patient assessment and management. By design, MR imaging was to be done before CT and the examinations were to be initiated within 120 minutes of each other; however, patients who did not meet this requirement were not excluded from the analysis.

All scans were read by two neurora-

Continued on next page

Acute Stroke at RSNA 2007

MICHAEL H. LEV, M.D., will lead a special focus session, “Controversies in Acute Stroke: You Can’t Always Get What You Want But Can You Get What You Need?”

at RSNA 2007. More details will be available online at RSNA2007.RSNA.org.



Continued from previous page

diologists and two stroke neurologists at a separate hospital. The physicians were not informed which MR imaging study corresponded to the CT exam from the same patient, and three of the four readers had to agree for a finding to be considered a stroke. Researchers then compared the expert readers' results to those of the clinical team, which had all of the patients' medical information, including scans, tests and history.

Learn More

More information about the studies cited in this article is available online.

■ "Magnetic Resonance Imaging and Computed Tomography in Emergency Assessment of Patients with Suspected Acute Stroke: A Prospective Comparison" www.thelancet.com/journals/lancet/article/PIIS0140673607601512/abstract. Free registration is required.

■ "Tissue Plasminogen Activator for Acute Ischemic Stroke (The National Institute of Neurological Disorders and Stroke rt-PA Stroke Study Group)" content.nejm.org/cgi/content/abstract/333/24/1581.

ing should be made available immediately to all cases of suspected stroke presenting in an emergency department. The initial higher cost of MR imaging, he said, should be offset by the

The four readers unanimously agreed on the presence or absence of acute stroke in 80 percent of patients using MR imaging, compared to 58 percent using non-contrast CT. Relative to the final clinical diagnosis of acute stroke in almost two-thirds of patients, MR imaging had an accuracy of 89 percent versus 54 percent for CT.

Based on these results, said Dr.

Warach, MR imaging should be made available immediately to all cases of suspected stroke presenting in an emergency department. The initial higher cost of MR imaging, he said, should be offset by the

Blinded Imaging Diagnosis Compared to Final Clinical Diagnosis

	CT	MRI	Clinical Diagnosis
Acute stroke	59 (17%)	185 (52%)	217 (61%)
Acute ischemic stroke	35 (10%)	164 (46%)	190 (53%)
Acute intracranial hemorrhage	25 (7%)	23 (6%)	27 (8%)
No stroke	297 (83%)	171 (48%)	139 (39%)

Reprinted from *The Lancet* 2007;369:293-298. Chalela, J.A., et. al. "Magnetic Resonance Imaging and Computed Tomography in Emergency Assessment of Patients with Suspected Acute Stroke: A Prospective Comparison." © 2007, with permission from Elsevier.

increased diagnostic accuracy that leads to better patient outcomes and, ultimately, a decrease in the total cost of stroke care.

Some Say MR Better Suited After Three-Hour Window

Colin P. Derdeyn, M.D., an associate professor at the Mallinckrodt Institute of Radiology and Departments of Neurology and Neurological Surgery at Washington University School of Medicine in St. Louis, said MR should not replace CT for the evaluation of patients within the first three hours of stroke unless it can be done just as quickly and safely. Treatment with tPA is initiated if patients have symptoms of stroke and no evidence of hemorrhage on CT.

CT is not used to determine whether the patient had a stroke, said Dr. Derdeyn, a member of the *RSNA News* Editorial Board. CT is used to decide if the stroke—which is diagnosed clinically—was from a hemorrhage, he said. "CT scans are not very good at identifying an acute ischemic stroke—this is well established," he said. "It is no surprise that MR is better at identifying an

ischemic stroke. Right now, not only does this not matter, but substituting MR for CT will harm patients if this causes any delay in giving tPA."

The wrong message to take from the study, said Dr. Derdeyn, is that MR is required to treat acute stroke patients appropriately. "That is clearly wrong, particularly in the acute situation," he said. MR imaging currently has more to offer in patients that are seen after the three-hour window, he said, given the present availability of MR, its superiority over CT and the current treatments that are available.

"In this group, an accurate diagnosis of stroke is very important," Dr. Derdeyn said. "This information will guide the diagnostic evaluation looking for the cause of the stroke, as well as instituting treatment aimed at secondary stroke prevention."

Another stroke specialist said that because radiologists control the imaging process, the onus is on them to make MR faster so it can be a feasible alternative even within the first three hours. Howard Rowley, M.D., chief of neuro-

Continued on page 12

MR Imaging, Echocardiography Work in Tandem for Stroke Analysis

ANOTHER recently released study indicates that a combination of MR imaging and echocardiography helps physicians identify the cause of stroke—guiding not only decisions about the best initial therapy but also the choice of treatments aimed at preventing further stroke.

Released at the Society of Interventional Radiology (SIR) annual meeting in March, the study showed the combination was especially effective in identifying cardioembolic stroke. Researchers analyzed 106 patients who underwent cardiovascular MR imaging for suspected cardioembolic stroke, including 93 who also had echocardiogra-

phy, at Northwestern Memorial Hospital in Chicago between September 2005 and September 2006.

MR imaging was better at detecting a thrombus—the hallmark of a cardioembolic stroke—than was echocardiography, said James C. Carr, M.D., director of cardiovascular imaging in the Department of Radiology at Northwestern University Medical School. He added that MR imag-

ing also found conditions, such as scars in the myocardium indicating a previous heart attack, that predispose a person to stroke.

Echocardiography was more sensitive in detecting other relevant conditions, such as potential embolic lesions on prosthetic cardiac valves and strokes related to a hole in the heart.

"The two tests definitely play a complementary role," said Dr. Carr.

■ To view the abstract for "Evaluation of Patients with Suspected Cardioembolic Stroke with Cardiovascular MR: Comparison with Echocardiography," go to www.sirmeeting.org and click on Program in the taskbar across the top of the page. Click on Scientific Program in the left-hand sidebar, then click Abstract Presentation and choose Arterial Interventions: Neuro.

Filling Radiology's Leadership Void is Goal of New RSNA Course

"An army of thousands is easy to find, but, ah, how difficult to find a general."

A PROVERB with origins in Chinese warfare has become relevant in radiology, where some say a lack of critical leadership skills such as financial planning and personnel management has stunted the specialty's next generation of leaders.

"When chair positions come up, I'm asked to submit names and although I know a lot of radiologists, my list is always just a handful of names, a few good men and women," said Ronald L. Arenson, M.D., chair of the Department of Radiology at the University of California, San Francisco. "There aren't a lot of natural leaders at intermediate levels and it's a problem."

In response, RSNA has developed Tools for Success in the Practice of Radiology, a 1½ day course to be held June 29–30 at RSNA Headquarters in Oak Brook, Ill.

Designed for both current and future leaders in academia and private practice, the interactive course will focus on such skills as planning, staff development and quality and safety, with content tailored specifically for radiologists and their business managers.

Course Director Claire E. Bender, M.D., a professor of radiology at the Mayo Clinic College of Medicine in Rochester, Minn., said the program grew out of her own experiences and frustrations in radiology leadership positions.

"I see highly talented physicians at the clinic; they know how to teach, how to practice and do research, but



Ronald L. Arenson, M.D.
University of California, San Francisco



Claire E. Bender, M.D.
Mayo Clinic College of Medicine

they are poorly prepared as administrators," said Dr. Bender. Despite having undergone rigorous training and education, she said, many radiologists suffer later in their careers because they did not get the opportunity to develop critical leadership skills in medical school or residency.

"This program will share the tools of being a leader in radiology, which include being a visionary, a strategist, understanding conflict resolution, financial planning and improving communication," Dr. Bender said.

Small Class Size Promotes Interaction

The course is designed to give participants tools they can use immediately in their day-to-day work while emphasizing a culture of leadership among radiologists, according to Mellie Pouwels, M.A., director of the RSNA Education

Center. To that end, the course is limited to 50 registrants and promises an informal environment in which registrants can network.

"We encourage one-on-one communication between registrants before, during and after the meeting," said Dr. Bender.

Dr. Arenson agrees that radiologists' training generally does not allow for the development of leadership acumen. "Young people often don't have the skills needed to become a leader—managing finances and people, creative problem-solving, planning and critical thinking," he said.

Dr. Arenson, who will give the keynote address at the conference, said he believes good leaders have certain core skills including confidence—not to be confused with arrogance, he pointed out—even temperament, ability to think creatively and get perspective on an issue and good decision-making abilities.

These skills are essential, he said, for those who must recruit and mentor

*I see highly talented physicians
... they know how to teach,
how to practice and do
research, but they are poorly
prepared as administrators.*

Claire E. Bender, M.D.

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staff, understand research outside their field and, in particular, manage salaries. Financial experience isn't typically discussed during an interview for a chair or vice-chair position, he said, "but it's probably one of the most important things that person will do."

Other course instructors include Louellen Essex, Ph.D., an organizational psychologist and management consultant who will teach a session on Leadership Success Tools (see sidebar); C. Daniel Johnson, M.D., an internationally recognized leader in quality and safety; William J. Riley, Ph.D., who will teach financial and operational planning; and Carl C. Reading, M.D., who will cover staff development.

Undervaluing of Skills Partly Blamed for Leadership Need

One possible explanation for the dearth of radiologists with these leadership skills, said Dr. Arenson, is the fact that the skills are undervalued in medicine—and even more so in radiology.

"Radiologists will go to courses on the newest MR techniques, but they just don't think management abilities are important," said Dr. Arenson. The value of leadership skills is not lessened, he said, by the fact that some physicians view them as "touchy-feely."

"Is the measurement of the value of these skills anecdotal? In some cases, yes," said Dr. Bender. "But when you need help, where do you go? Radiology

leaders don't have a lot of time. If I can teach you a technique and say, 'this is a better way to run a meeting or communicate or approach a staff member,' you're going to have a better day. It's not going to be a perfect day, but a better day."

Dr. Bender acknowledged that learning the finer points of communication may not be a radiologist's first educational priority. "But if we don't

understand the communication styles and the needs of the people we're talking to, we're not going to be successful," she said.

She added that interpersonal issues constitute the largest area of complaint she hears from other radiology practice leaders. "Ninety percent of their time is taken up with personnel issues," she said.

Course registrant Erika Mann, M.D., of The Hospital for Sick Children in Toronto, said she sees the conference as an opportunity to make a different type of contribution to her group.

"It's a way for me to consolidate my current knowledge and broaden my perspectives for future considerations," said Dr. Mann, adding that radiologists can be uniquely fluent in the day-to-day issues of running a practice.

"Administrative aspects of radiology are often delegated to people other than radiologists, who may find themselves pinched for time or uninterested," she said. "With some training, hopefully I will be more alert and aware as to the proficiencies and deficiencies

■ For more information and to register for Tools for Success in the Practice of Radiology, go to RSNA.org/Education/RSNA_shortcourses.cfm.



5 Keys to Leadership Success

Louellen N. Essex, Ph.D., who will lead the session "Leadership Success Tools" at the RSNA Tools for Success in the Practice of Radiology course, shared the top five ways physician leaders can create conditions where others do their best work. Dr. Essex is an organizational learning and development consultant and author.

1 Inspire a Common Set of Goals and Values. Effective leaders rally people around their organization's mission by working behind the scenes to solve problems and presenting a positive front to those with whom they interact each day.

2 Model Behavioral Standards. Great leaders recognize that they set the tone for others and display professional behavior at all times.

3 Build a Collaborative Work Environment. A good leader demonstrates a high regard for different opinions and bridges differences to build consensus.

4 Freely Give Praise and Recognition. Giving credit to others is vital to motivating high performance.

5 Stay Keenly Self-Aware. Great leaders cultivate their skills around their passions and ask themselves what energizes them the most.

in our environment."

She said she is optimistic that the training will "translate into better practice regarding equipment, daily activities, workload and interpersonal dynamics within the department and extend to our referring services." □

MR Outperforms CT in Stroke Diagnosis But Practicality Issues Remain

Continued from page 10

radiology and the Joseph Sackett Professor of Radiology at the University of Wisconsin in Madison and co-instructor of an interactive session on acute stroke treatment at RSNA 2006, said he envisions young radiology researchers creating comprehensive strategies for the rapid treatment of stroke patients.

"Radiologists need to step up to the plate and develop fast, comprehensive imaging strategies to discover the site of vessel occlusion and the tissue at risk in acute stroke," he said.

Drs. Warach and Rowley agree that hospitals must also address issues of MR imaging access and availability. "Hospitals need rapid systems for MR

imaging screening, transportation to and from the scanner and technical staff in place during off hours. This is possible in the real world, but it comes down to building the financial resources to pay for it," said Dr. Rowley. □

Digital Imaging Illuminates Question of Ideal Room Lighting

THE ongoing shift to viewing digital images on computer monitors, rather than a traditional film on a lightbox, has brought a new issue to light—ambient room light, that is.

“We were a little concerned that the viewing environments in which radiologists look at clinical images were not optimum in terms of light levels,” said Patrick C. Brennan, Ph.D., lead author of an ambient light study published recently in the *American Journal of Roentgenology*. “Suddenly with this move from film to looking at an image on a monitor, the light levels from the screen were significantly less,” said Dr. Brennan, a professor in the School of Medicine and Medical Sciences at the University College Dublin in Ireland.

Existing guidelines include World Health Organization (WHO) and Commission of European Communities (CEC) standards for ambient lighting in viewing environments, which suggest 100 lux at 30 centimeters and 50 lux at 100 centimeters, respectively. Dr. Brennan pointed out, however, that the WHO standards were created more than 20 years ago for film viewing. Even the CEC standards, less than 10 years old, are still out of date due to the rapid increase in digital viewing, he said.

In 2005, the American Association

of Physicists in Medicine released an extensive series of tables detailing the optimal light levels for viewing filmless images based on a variety of variables, including screen and monitor surface reflections. Yet those standards were so specific that they became impractical for use in the average hospital or clinic environment where there might be hundreds of monitors, all of different types and in different locations, said Dr. Brennan. What he wanted was a simple standard that would be more useful in the average situation. “When you go into a room, what should the light level be for a typical monitor?” he asked.

Dark Room Not Best Viewing Environment

Dr. Brennan’s study, done in conjunction with the American Board of Radiology, tested five ambient light levels: 480 lux (near the average office light level), 100 lux, 40 lux, 25 lux and 7 lux. Seventy-nine experienced radiologists examined 30 wrist images on liquid crystal display (LCD) monitors to determine the presence of a fracture. Results showed the fewest diagnostic errors at a level between 40 and 25 lux, which Dr. Brennan compared to a dim hotel room

at night. Researchers also found that the errors and misdiagnoses that did occur at appropriate lighting levels were usually false-positives rather than missed fractures.

Dr. Brennan said he was also surprised to find that, contrary to conven-

When you go into a room, what should the light level be for a typical monitor?

Patrick C. Brennan, Ph.D.

tional wisdom, a completely dark reading room does not provide the best viewing environment. “We showed that when you remove all ambient light and have the traditional envi-

ronment we would expect in a radiologist’s office, with the onscreen image shining out of the midst of complete blackness, you do not get a better reading,” he said.

Dr. Brennan consulted data presented by imaging display specialists Michael J. Flynn, Ph.D., a diagnostic radiology researcher with the Henry Ford Health System in Detroit, and Aldo Badano, Ph.D., a staff fellow in the FDA’s Center for Devices and Radiological Health. They explained that because the eye adapts to the average brightness of a room, its ability to discriminate between gray levels is best when the ambient light level of the room is close

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Experienced radiologists reading wrist images at five ambient light levels made the fewest diagnostic errors between 40 and 25 lux, a level researchers compare to a dim hotel room at night. The average office light level is near 480 lux.

Continued from previous page

to the amount of light coming from the screen. In total darkness, on the other hand, the eye adjusts downward toward the lower average brightness.

Dr. Brennan wondered if his study might have underestimated the impact of the environment on image viewing—identifying wrist fractures was “maybe a little too easy,” he said—and therefore sought something more challenging to help discriminate between the variables. A study of radiologists asked to detect chest lesions yielded results similar to those of the wrist study and was presented at the International Society for Optical Engineering (SPIE) medical imaging conference in San Diego in February.

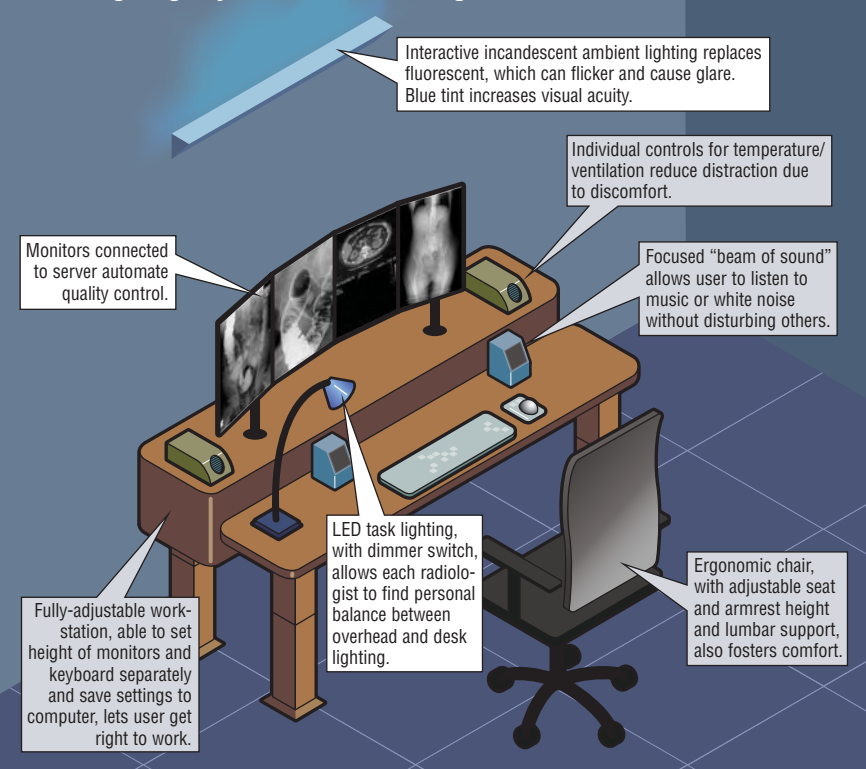
Ambient Lighting Addressed in Futuristic Reading Room

Optimal reading environments is one of the hottest topics in radiology right now, said Eliot L. Siegel, M.D., who helped create what has been called “the reading room of the future”—a prototype, best case scenario for interpreting images on a Picture Archiving and Communication System (PACS), housed at the Baltimore Veterans Affairs (VA) Medical Center.

The model reading room features computer-controlled lighting at the workstations, including presets that allow various users to instantly adjust the lighting to their preferred levels. The room also uses blue lighting to increase visual acuity.

“What we believe is really important is to have the proper match between the brightness of the monitor

Correct Lighting Key Part of Ideal Reading Environment



Information courtesy of “Innovation in Reading Room Design” by GE Healthcare and Baltimore Veterans Affairs Medical Center. Artwork by Adam Ingly.

and the brightness of the background light,” said Dr. Siegel, professor and vice-chair of the Department of Diagnostic Radiology in the University of Maryland School of Medicine and chief of radiology and nuclear medicine for the Maryland VA Healthcare System.

“We also believe it’s optimal to give each radiologist control of the overhead lights,” Dr. Siegel added. The reading room does not use fluorescent lights because of the flicker and the associated glare, he said, but instead features interactive incandescent lighting with a dimmer switch. Light-emitting diode (LED) lighting technology also allows each radiologist to find a personal balance between overhead and desk lighting at the reading stations. The presets even allow users to set lighting levels to change over the course of a day in order to adjust to how human visual acuity changes.

Dr. Brennan said he hopes all the research will help bring about not only newer and more relevant international standards for ambient light levels, but also ones to which radiologists feel they can adhere. In a separate study of light levels in three radiologic environments, Dr. Brennan found that monitors were being viewed in conditions suggested

by WHO in only 75 percent of cases and in line with CEC standards in just 45 percent. The study was published in the February 2003 issue of the *British Journal of Radiology*.

More importantly, a study Brennan published in the Spring 2007 issue of the *Canadian Journal of Medical Radiation Technology* indicated that when viewing images in environments outside radiology departments or offices, physician adherence to the standards dropped to just 7 percent. “Light levels vary hugely in a clinical environment,” said Dr. Brennan. “These days, there’s a 50 percent chance that your image will be judged in an outpatient clinic, emergency department or other non-optimal lighting environment.” □

Lighting Issues at RSNA 2007

“Workstation Design,” one of numerous informatics refresher courses to be offered at RSNA 2007, will address issues of reading room ergonomics along with hardware and software options. Registration for this and all RSNA 2007 courses begins June 18. More information will be available at RSNA2007.RSNA.org.



Learn More

More information about the studies cited in this article is available online.

- “Ambient Lighting: Effect of Illumination on Soft-Copy Viewing of Radiographs of the Wrist” www.ajronline.org/cgi/content/abstract/188/2/W177.
- “Viewing conditions for diagnostic images in three major Dublin hospitals: a comparison with WHO and GEC recommendations” bjr.birjournals.org/cgi/content/full/76/902/94.

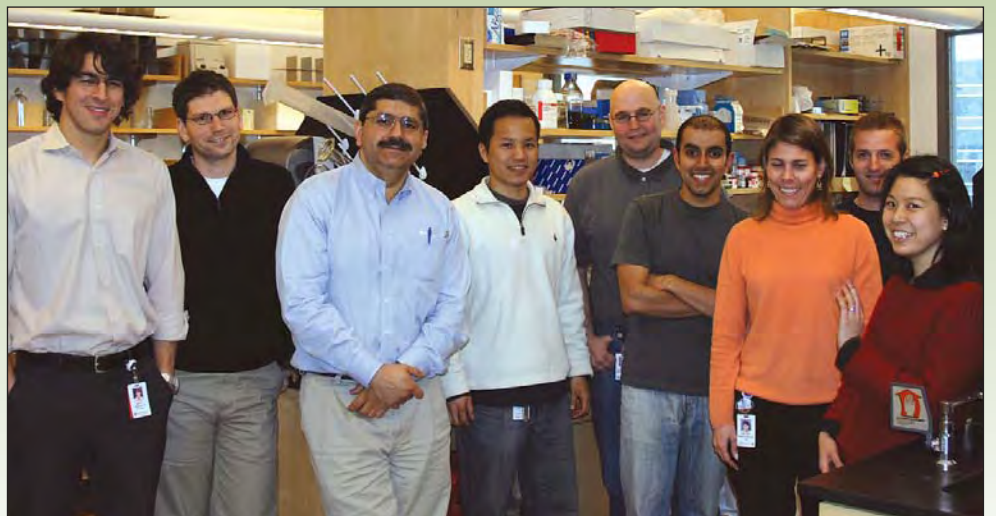
RSNA Research Resident Harnesses Power of Optical Imaging for Customized Care

IN THE AGE of TiVo, iPods and other technology that allows people to customize the world around them, can designer medicine be far behind?

Umar Mahmood, M.D., Ph.D., doesn't think so. Recipient of an RSNA Research & Education Foundation Research Resident Grant in 2000, Dr. Mahmood has spent much of his career working at the Harvard Center for Molecular Imaging Research (CMIR) on imaging he believes will provide more specialized diagnosis and treatments for patients in the future.

"Therapies are getting molecularly more specific," said Dr. Mahmood, a clinical radiologist and associate professor of radiology at Massachusetts General Hospital (MGH). "It used to be that chemotherapy would hit all dividing cells. As time has gone on, the therapies are much more targeted toward the specific pathways that are abnormal. Those abnormal pathways differ from individual to individual, and molecular imaging allows us to optimize patient care by determining combinations of therapies set to each individual's level. That's really the big picture goal and to a certain degree we are starting to do this for a number of diseases."

Within six months of starting his residency at MGH in 1997, Dr. Mahmood was working at CMIR and looking for a new challenge. In vivo optical imaging, if it was on anyone's radar, was at that time considered the "new



Umar Mahmood, M.D., Ph.D. (third from left), poses with members of his research group at the Harvard Center for Molecular Imaging Research.

kid on the block," he said, and not much thought was given to how it might be used for human applications. He was fascinated by its prospects.

Setting about to build imaging devices and systems to test optical imaging in animals, Dr. Mahmood soon developed the center's first single channel imaging system—an innovation that provided preliminary data for his RSNA Research

Resident Grant. He then expanded the system to allow for the imaging of multiple targets simultaneously.

"Umar had a creative idea that took what we were doing and extended it in a new direction," said CMIR Director Ralph Weissleder, M.D., Ph.D. "He shows the same creativity today in the

directions he has chosen to take his research group in our center."

RSNA Research Sought Simultaneous Imaging of Multiple Abnormalities

As an RSNA Research Resident, Dr. Mahmood pursued a project called "Multiple Wavelength Optical Imaging for Simultaneous in vivo Imaging of Two Different Enzyme Activities." His goal was not only to image two enzyme activities but also to study more than one genetic abnormality at a time with optical imaging.

"The RSNA award allowed me to write my first grant as a principal investigator, and it gave me the freedom to explore some new ideas that I had," he said. "I was able to take my own risks to see if these ideas would work or not.

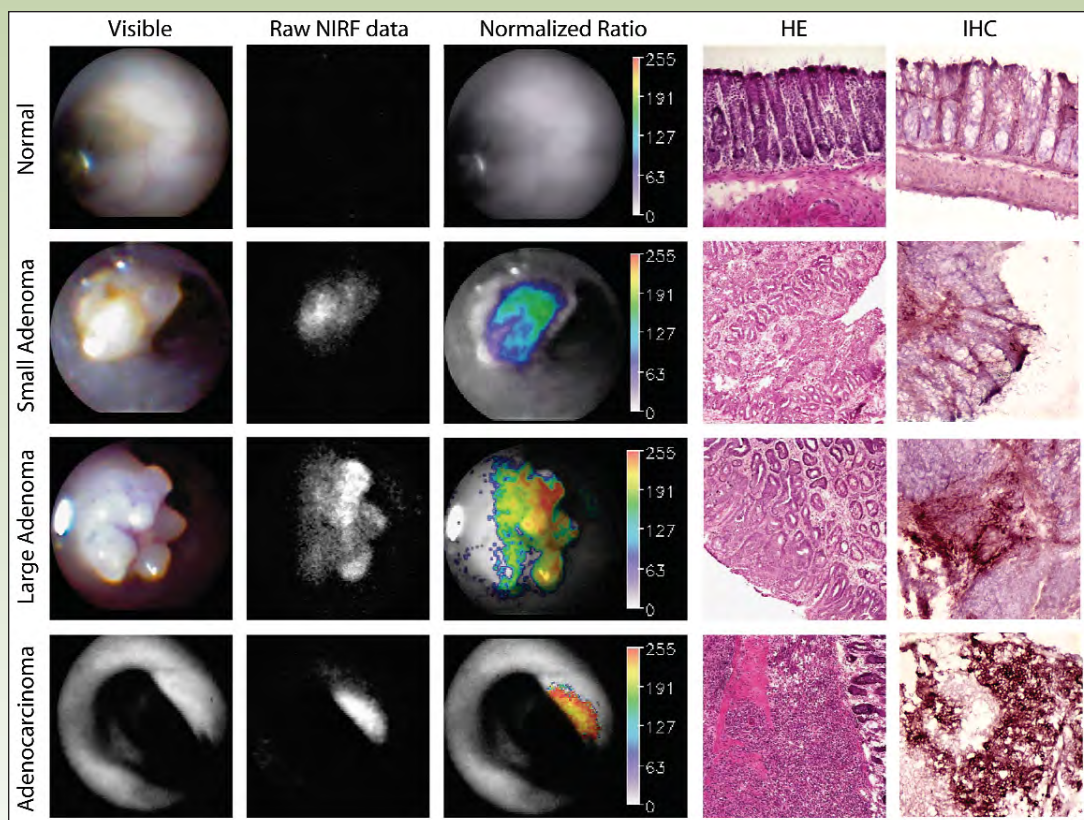
"I wanted to see if we could develop a system to look at more than

Continued on next page

It is up to radiologists to make sure [new technologies] get incorporated in the best possible way, to answer questions or disease indications.

Umar Mahmood, M.D., Ph.D.

RSNA Research Resident Umar Mahmood, M.D., Ph.D., participated in a study to develop a novel multichannel microendoscope capable of quantitatively reporting molecularly targeted fluorescent probes simultaneously at different wavelengths in real time. Results were reported in the October 2006 issue of *Gastrointestinal Endoscopy*.



Series of murine colonoscopies evaluating protease expression and tumor perfusion demonstrate an increasing ratio with more aggressive lesions.

Reprinted from *Gastrointestinal Endoscopy* 2006;64:589-597. Funovics, M.A., et al. "Simultaneous fluorescence imaging of protease expression and vascularity during murine colonoscopy for colonic lesion characterization." © 2006, with permission from Elsevier.

Continued from previous page

one target at a time because many diseases represent more than one abnormality," he continued. "By combining the imaging of these different abnormalities, you can better characterize the disease and get a better idea of what therapies to give by understanding what different molecular parameters are altered."

The successful RSNA research evolved into an R01 grant from the National Institutes of Health for a similar project. Today, some of the enzymatically activated probes he helped developed are bound for human clinical trials, which he feels will change the way some diseases are examined and identified in the future.

Dr. Mahmood now oversees a group looking for ways to apply optical imaging detection devices and techniques to a spectrum of diseases including colon, lung, breast and ovarian cancers. Multimodality paradigms and probes he developed also are used to look for brain tumor margins, as

well as in rheumatoid arthritis and other joint diseases and pancreatic cancer.

Dr. Mahmood foresees a very bright future for optical imaging after it has evolved and proven itself through animal and clinical trials.

"New technologies come along every once in awhile, like PET, MR imaging and CT did in the 1970s," he said. "It is up to radiologists to make sure they get incorporated in the best possible way, to answer questions or disease indications.

"Optical imaging is still early in its evolution, but it looks very promising," he concluded. "For some indications, MR is the way to go. For others, CT is the way. In the future, there will be some indications for which optical will be the way to diagnose the disease." □

■ Additional information about RSNA Research & Education Foundation grant programs and other past recipients is available at RSNA.org/foundation.



A Few More Questions for...

Umar Mahmood, M.D., Ph.D.

What is your favorite way to relax?
Play (and lose) games with my kids.

If you could visit any place in the world, where would it be?

The International Space Station, which is now a tourist destination.

If you weren't a radiologist, what profession would you be in?

Blues guitarist, if I could play.

At what age did you first become aware of radiology?

At age 7, when I hurt my ankle. I was wondering if the X-rays would hurt.

What do you like best about your job?

I focus on a lot of different areas so I don't get bored.

If you had one piece of advice for someone considering your field, what would it be?

Don't try to directly image something that is present at one or two copies per cell, at least not in the near future.

What projects are you working on at home?

LEGO Mindstorms NXT.



Research & Education Foundation Donors

THE Board of Trustees of the RSNA Research & Education Foundation and its recipients of research and education grants gratefully acknowledge the contributions made to the Foundation Feb. 17 – March 16, 2007.

Donors who achieve milestones with their cumulative giving are recognized through the Foundation's Visionary Donor Program.

For more information on Foundation activities, go to RSNA.org/foundation.

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Journal Highlights

The following are highlights from the current issues of RSNA's two peer-reviewed journals.

Gastroesophageal Reflux Disease: Integrating the Barium Esophagram Before and After Antireflux Surgery

WHILE gastroesophageal reflux disease (GERD) is common and laparoscopic antireflux surgery a typical treatment, there is no consensus as to whether barium examination or endoscopy should be used to evaluate patients before and after surgery.

In an article in the How I Do It section of the May issue of *Radiology* (RSNA.org/radiologyjnl), Mark E. Baker, M.D., of the Department of Diagnostic Radiology at the Cleveland Clinic Center for Swallowing and **Radiology** Esophageal Disorders, and colleagues assert that because radiologists are untrained or uninterested—and gastroenterologists and surgeons are biased—endoscopy has almost completely replaced the barium examination in medicine at large.

At the Cleveland Clinic, however, physicians from the departments of gastroenterology, otolaryngology and speech disorders, radiology and thoracic surgery collaborate on the diagnosis and treatment of patients with esophageal diseases, according to the authors. The barium esophagram is often critical, they say.

Describing their technique, the factors they evaluate and how they integrate findings into patient care, Dr. Baker and colleagues specifically describe topics including:

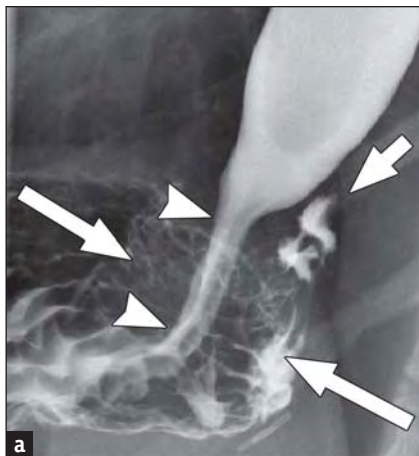
- Solid food phase: technique and findings prior to antireflux surgery
- Patient presentation after antireflux surgery



Normal Toupet, or partial, fundoplication.

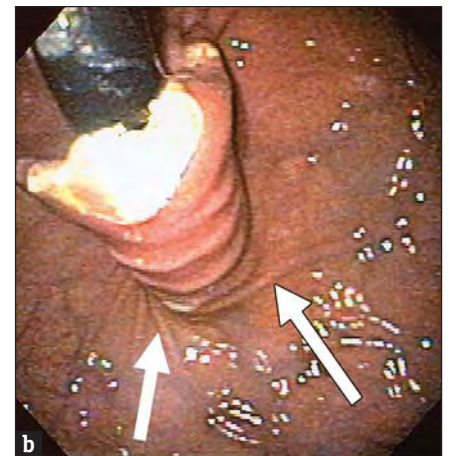
Anteroposterior spot radiograph of gastric fundus in semiupright position after air-contrast portion of esophagography shows that blind-end leaves of the wrap (arrows) are not directly opposed.

(*Radiology* 2007;243:329-339) © RSNA, 2007. All rights reserved. Reprinted with permission.



Long, twisted, partially supradiaphragmatic fundoplication surrounding the stomach in a patient with dysphagia and gas bloat after surgery.

(a) Semiprone (right anterior oblique) esophagram during distended single-contrast phase esophagography shows fundoplication (long arrows) surrounding gastric folds (arrowheads). Position of arrowheads roughly approximates the superior and inferior extent of fundoplication. A portion of fundoplication (short arrow) has herniated above the diaphragm in paraesophageal location. (b) Retroflexed endoscopic view of fundus shows twist in gastric folds (arrows) caused by the fundoplication.



- Postfundoplication appearance on the barium esophagram
- Pertinent findings in patients with postfundoplication dysphagia, epigastric pain and gas bloat

“We are evaluating more patients before and after antireflux surgery,” the authors write. “Because our approach is multidisciplinary and is applied to a

large number of patients, we thought it timely to communicate our esophagography technique.”

What Every Radiologist Should Know about Idiopathic Interstitial Pneumonias

BECAUSE imaging plays a crucial role in identifying both idiopathic and secondary interstitial pneumonias, radiologists must be familiar with the morphologic and clinical manifestations and the diagnostic approach to these conditions.

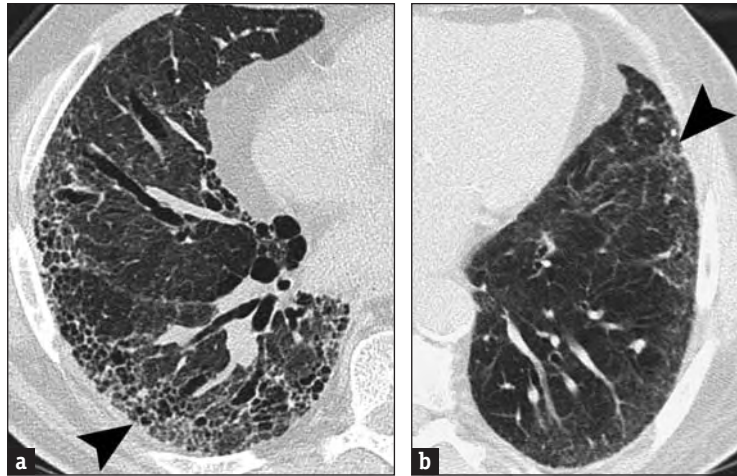
RadioGraphics

In an article in the May-June issue of *RadioGraphics* (RSNA.org/radiographics), Christina Mueller-Mang, M.D., of the University of Vienna, Austria, and colleagues describe the morphologic patterns associated with idiopathic interstitial pneumonias (IIPs), how to identify them at high-resolution CT and how to interpret them in the appropriate clinicopathologic context.

The diagnostic approach to IIPs has long been confusing, the authors note, because these disorders were categorized according to different clinical, radiologic and histologic classifications. The American Thoracic Society and European Respiratory Society standardized IIP terminology in 2001.

Among the IIPs for which Dr. Mueller-Mang and colleagues characterize the clinical, histologic and imaging features are:

- Idiopathic Pulmonary Fibrosis
- Cryptogenic Organizing Pneumonia
- Respiratory Bronchiolitis-associated Interstitial Lung Disease



Comparison of high-resolution CT features between usual interstitial pneumonia (UIP) and nonspecific interstitial pneumonia (NSIP).

(a) UIP is characterized by heterogeneous lung abnormalities consisting of subpleural honeycombing (arrowhead), reticular opacities and traction bronchiectasis. (b) NSIP demonstrates homogeneous lung involvement with predominance of ground-glass attenuation combined with subpleural linear opacities and micronodules. The microcysts in NSIP (arrowhead) are much smaller than the honeycombing in UIP.

(*RadioGraphics* 2007; 27:595-615) © RSNA, 2007. All rights reserved. Reprinted with permission.

• Lymphoid Interstitial Pneumonia

This article meets the criteria for 1.0 AMA PRA Category 1 Credit.

“There is substantial overlap in the CT appearances of ... IIPs,” Dr. Mueller-Mang and colleagues conclude. “Therefore, accurate diagnosis of these disorders requires a dynamic interdisciplinary approach that correlates clinical, radiologic and pathologic features.”

Radiology in Public Focus

Media Coverage of Radiology

IN March, media outlets carried 129 news stories generated by articles appearing in *Radiology*. These stories reached an estimated 79 million people.

A news release promoted findings from a study on MR measurement of intra-abdominal fat in adolescents (*Radiology* 2007;242:846-856). Coverage of that study and other recent studies included print placements in the *Los Angeles Times*, *Houston Chronicle*, *St. Louis Post-Dispatch*, *South Florida Sun-Sentinel*, *The Globe and Mail* (Toronto), *Internal Medicine News*, *Modern Healthcare* and *Family Practice News*. Prominent Web placements include Yahoo! News, *iVillage.com*, *washingtonpost.com* and *healthcentral.com*.

May Public Information Activities Focus on Stroke

In recognition of American Stroke Month, public service announcements (PSAs) distributed by the RSNA Public Information and Media Relations Department in May focus on:

- Stroke prevention
- Signs of stroke
- Stroke imaging
- Interventional treatments for stroke
- Importance of receiving stroke treatment quickly

In addition to the printed and prerecorded PSAs provided to media outlets throughout the U.S., the Public Information and Media Relations Department also distributes the “60-Second Checkup” audio program to radio stations. The “60-Second Checkup,” which also focuses on stroke this month, starts with a short introduction by a reporter and includes a brief interview with an expert.

Working For You

RSNA Committees

RSNA News continues its series highlighting the work of RSNA's volunteer committees with a look at the Research Development Committee.

Research Development Committee

WITH A mission to promote research throughout the radiologic community, the RSNA Research Development Committee (RDC) touches every step of the research process, from concept to conclusion and beyond.

To prepare would-be researchers, the RDC helps RSNA offer the Clinical Trials Methodology Workshop, Advanced Grant Writing Course, Introduction to Research Program and NIH Grantsmanship Workshop and other activities.

Institutions benefit from the Revitalizing the Radiology Research Enterprise (RRRE) program, an RDC-guided program that gives academic department chairs and research directors advice and models for strengthening their research infrastructures.

Working for you
COMMITTEE PROFILE

Beyond the bench, the RDC also keeps RSNA at the forefront of the very latest in radiologic research topics—such as imaging studies being developed as quantitative biomarkers to measure disease progression or treatment

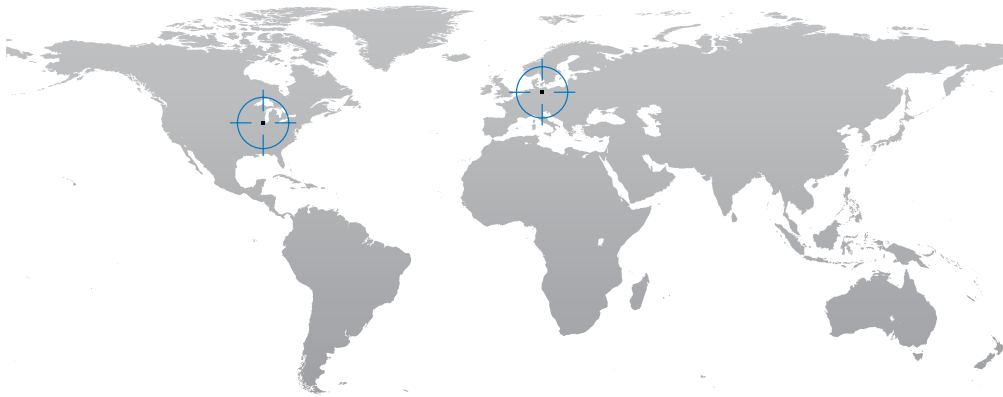
response. The RDC also ensures the Society's collaboration with research-related committees of other major radiology societies.

"Research is the lifeblood of every scientific discipline," said RDC Chair Daniel C. Sullivan, M.D. "RSNA's support of the RDC is essential in ensuring that the practice of radiology remains clinically relevant in this emerging era of molecular and personalized medicine."



Daniel C. Sullivan, M.D.

RSNA Booth Goes to Germany, Chicago



RSNA representatives will travel to Berlin this month to staff the Society's booth at the German Congress of Radiology, May 16–19. People interested in RSNA can learn about the benefits of RSNA membership, including educational products and journals. RSNA

members are also encouraged to stop by the booth and learn what's new at RSNA.

The booth will also make a stop at the American Society for Clinical Oncology, June 1–5 in Chicago.

InteractED® Celebrates 7th Anniversary

In the seven years it has been available on *RSNA.org*, the InteractED® online education resource has amassed more than 15,000 registered radiologists and 300 peer-reviewed programs available for *AMA PRA Category 1 Credit™*. RSNA members have free access to all InteractED programs.



If you have a colleague who would like to become an RSNA member, you can download an application at RSNA.org/mbrapp or contact the RSNA Membership and Subscriptions Department at 1-877-RSNA-MEM [776-2636] (U.S. and Canada), 1-630-571-7873 or membership@rsna.org.

Program and Grant Announcements

RSNA 2008 Clinical Trials and Methodology Workshop

Application Deadline – June 5

Applications are being accepted for the 2008 Clinical Trials Methodology Workshop, to be held January 5–11, 2008, at the Hyatt Regency Scottsdale, Ariz. The workshop is designed to train radiology, radiation oncology and nuclear medicine faculty, fellows and residents (4th year and above) in developing protocols for the clinical evaluation of imaging modalities. Plenty of time is set aside for writing and revising onsite.



RSNA Advanced Course in Grant Writing

Application Deadline – July 1

This course helps junior faculty members prepare and submit a National Institutes of Health, National Science Foundation or equivalent grant application. The course will consist of four two-day sessions at RSNA Headquarters in Oak Brook, Ill., over a nine-month period beginning in September 2007.

RSNA/AUR/ARRS Introduction to Research Program

Nomination Deadline – July 15

Sponsored by RSNA, the American Roentgen Ray Society (ARRS) and Association of University Radiologists (AUR), this program encourages young radiologists to pursue careers in academic radiology. Eighty residents will be selected to participate in a seminar held during either RSNA 2007 or the ARRS annual meeting in 2008. Radiology departments are invited to nominate a current first-year resident.

Forms for these programs are available at RSNA.org/research/educational_courses.cfm. For more information, contact Fiona Miller at fmiller@rsna.org or 1-630-590-7741.

RSNA Derek Harwood-Nash International Fellowship

Application Deadline – July 1

International radiologists three to 10 years beyond training are invited to apply for this six- to 12-week fellowship at a North American institution. One or two fellows will be selected.



The application form for this program is available at RSNA.org/international/CIRE/dhmash.cfm. For more information, contact Fiona Miller at fmiller@rsna.org or 1-630-590-7741.

Tools for Success in the Practice of Radiology

June 29–30 • RSNA Headquarters in Oak Brook, Ill.

Online Registration Now Open

This customized, interactive seminar, featuring sessions on leadership, planning, staff development and quality and safety, will help participants confidently lead their practice through day-to-day issues on the job. Claire E. Bender, M.D., of the Mayo Clinic College of Medicine in Rochester, Minn., is directing the course. More information is available at RSNA.org/education/RSNA_shortcourses.cfm or by calling the RSNA Education Center at 1-800-381-6660 x7772. A feature article further describing the course appears on page 11.



AMI/RSNA/SNM/SMI Pre-Conference Symposium: Imaging in Molecular Medicine 2007

September 7–8 • Providence, R.I.

Registration is now open for this symposium immediately preceding the Academy of Molecular Imaging (AMI)/Society for Molecular Imaging (SMI) Joint Molecular Imaging Conference. The symposium will comprise two clinical tracks:

- Molecular Imaging Fundamentals in Medicine—introduction and overview of molecular imaging
 - Clinical PET/CT Imaging—essentials of clinical PET/CT
- More information is available at www.molecularimaging.org or by contacting Fiona Miller at fmiller@rsna.org or 1-630-590-7741.

NIH Pathway to Independence Program

Next Application Deadline – June 12

The National Institutes of Health (NIH) Pathway to Independence award program facilitates an earlier transition from mentored postdoctoral research to stable independent research with NIH or other support. The award provides one to two years of mentored support followed by up to three years of independent support contingent on securing an independent tenure-track or equivalent research position. NIH anticipates issuing up to 1,000 awards totaling \$400 million during the five-year program. More information is available at www.grants.nih.gov/grants/new_investigators/pathway_independence.htm.

News about RSNA 2007

Advance Registration and Housing

RSNA and AAPM members can register now for RSNA 2007. Non-member registration and housing opens May 21.

Refresher Course Enrollment Begins June 18

Course enrollment information will be mailed in mid-June and will also be available online at RSNA.org/register.

Important Dates for RSNA 2007

May 21	Non-member registration and housing opens
June 18	Course enrollment opens
Nov. 5	Final advance registration, housing and course enrollment deadline
Nov. 25-30	RSNA 93rd Scientific Assembly and Annual Meeting

International Visitors

Invitation Letters and Visas—Act Now

Personalized invitation letters are available at RSNA2007.RSNA.org. Click on International Visitors.

The International Visitors section of the annual meeting Web site also includes important information about visa applications. 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. It is recommended that international visitors start their visa process now. For more information, go to:

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

Registering for RSNA 2007

There are four ways to register for RSNA 2007:

1 Internet

Go to RSNA.org/register

Use your member ID number from

Fastest way to register!

the *RSNA News* label or meeting flyer sent to you. If you have questions, send an e-mail to rsna@experient-inc.com.

2 Fax (24 hours)

1-800-521-6017

1-847-940-2386

3 Telephone

(Monday–Friday,
8:00 a.m.–5:00 p.m. CT)

1-800-650-7018

1-847-940-2155

4 Mail

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108 Wilmot Rd.,

Suite 400

Deerfield, IL 60015-5124

USA

Registration Fees

BY 11/5	ONSITE	
\$0	\$100	RSNA Member, AAPM Member
\$0	\$0	Member Presenter
\$0	\$0	RSNA Member-in-Training, RSNA Student Member and Non-Member Student
\$0	\$0	Non-Member Presenter
\$130	\$230	Non-Member Resident/Trainee
\$130	\$230	Radiology Support Personnel
\$620	\$720	Non-Member Radiologist, Physicist or Physician
\$620	\$720	Hospital or Facility Executive, Commercial Research and Development Personnel, Healthcare Consultant, Industry Personnel
\$300	\$300	One-day registration to view only the Technical Exhibits area



RSNA 2007

CONNECTING RADIOLOGY

93rd Scientific Assembly
and Annual Meeting
November 25–30, 2007
Chicago

For more information about registering for RSNA 2007, visit RSNA2007.RSNA.org, e-mail reginfo@rsna.org or call 1-800-381-6660 x7862.

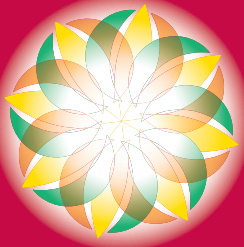
News about RSNA Highlights™ 2008

RSNA Highlights™ 2008 will be held Feb. 18–20 at the Ritz-Carlton/JW Marriott Orlando, Grande Lakes in Florida. Course topics include cardiac imaging, head and neck imaging, thoracic imaging and breast imaging.

RSNA Highlights was designed for people who can't attend the annual meeting or those who attend but find they

can't get to every lecture they want. RSNA Highlights 2008 attendees will also be able to access to select electronic education exhibits from RSNA 2007.

Advance registration opens September 4. More information will be announced in future issues of *RSNA News* and on the Web at RSNA.org/highlights.



RSNA®

Highlights™ 2008

February 18–20 ▶ Ritz-Carlton / JW Marriott Orlando, Grande Lakes



Course emphasis will include:

- ▶ Cardiac imaging
- ▶ Head and neck imaging
- ▶ Thoracic imaging
- ▶ Breast imaging

For more information about
the RSNA Highlights 2008
educational conference visit
RSNA.org/highlights

RSNA Education



Product News

NEW PRODUCT

Tabletop Imager

AGFA HEALTHCARE (www.agfa.com) has introduced the DRYSTAR™ AXYS™ tabletop imager, a centralized hard-copy solution designed to fit applications including mammography, CT, MR imaging and computed radiography. The DRYSTAR AXYS offers an image resolution of 508 dpi and delivers the five first prints extremely quickly. The DRYSTAR AXYS is the only tabletop imager on the market able to print mammography images and incorporates Agfa's proprietary Direct Digital Imaging software to control every pixel in an image for consistent image quality. The non-light sensitive film used by the DRYSTAR AXYS can be loaded or removed without concern for ambient light. Five film sizes and three film types are available.



NEW PRODUCT

Molecular Imaging Agents

The Molecular Imaging Systems Group of Eastman Kodak Company (www.kodak.com) has introduced X-Sight imaging agents for in vivo molecular imaging applications. According to the company, the X-Sight line exhibits superior fluorescence when compared to spectrally similar fluorochromes. With a proprietary construction that makes them more photostable and offers more time for image capture, the agents also have a particle size (16–17 nm) that allows for a relatively long circulation period. The agents can accommodate high payloads of targeting moieties, leading to greater specificity, according to the company. X-Sight imaging agents are available in several distinct fluorescent wavelengths.

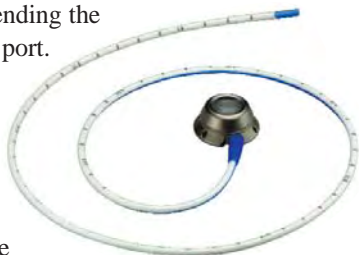


NEW PRODUCT

CT-Ready Vascular Access Port

AngioDynamics, Inc. (www.angiodynamics.com) now offers the Smart Port™ CT, a vascular access port indicated for power injection of contrast media with a flow rate of 5 mL/sec. The port was developed in response to market demand for expanded-use vascular access ports, so that patients requiring CT do not need an additional vascular access line. The patented design of the SmartPort CT enables superior fluid dynamics that eliminate dead space and the formation of sludge, thus extending the working life of the port.

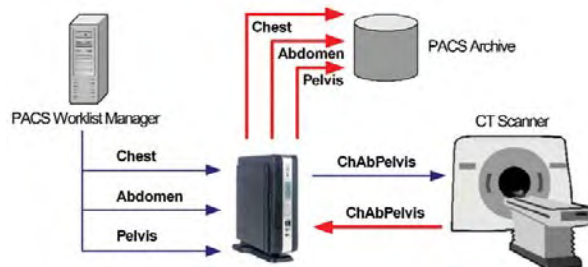
The Smart Port CT is available in 9.6 F and 7.5 F catheter sizes, features Fluoromax® 100 percent silicone catheters with a radiopaque shaft and tip and offers a large septum for easy access.



NEW PRODUCT

CT Workflow Engine

DeJarnette Research Systems (www.dejarnette.com) has announced the release of version 3.0 of its dyseCT™ CT workflow engine, which takes advantage of the very latest in computer operating and database systems. Based on customer demand, the 3.0 release also includes the ability to separate thoracic spine, lumbar spine and reformatted studies, as well as improvements in the basic pattern recognition engine. On the market for nearly three years, the dyseCT is still the only automated solution for splitting whole body CT studies into separate studies based on radiology information system orders. The algorithm for splitting studies has evolved, according to the company, with significant improvement even in abnormal CT studies such as those of surgical patients.



RSNA.org

RSNA 2007 Registration

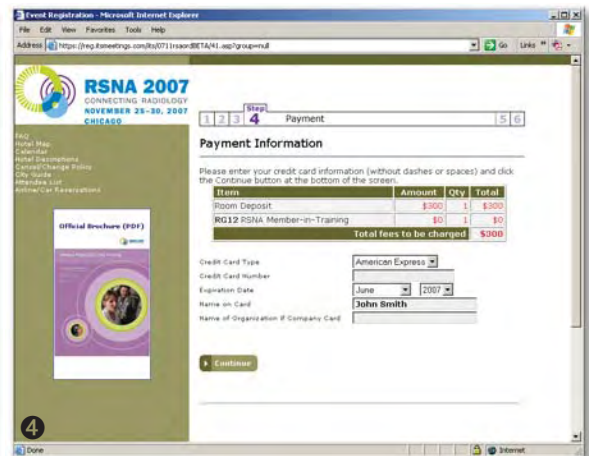
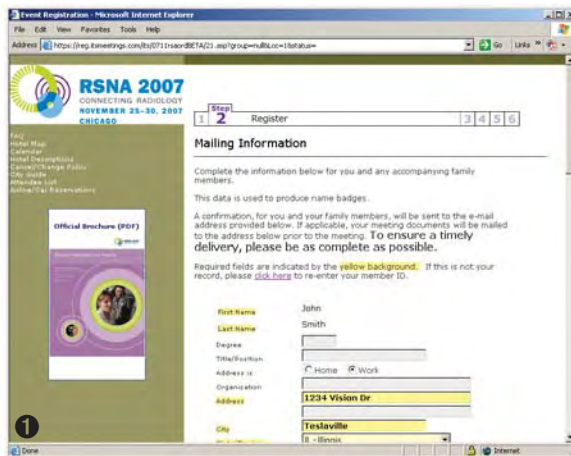
RSNA and AAPM members can register now for RSNA 2007. Non-member registration opens May 21. To register, go to *RSNA.org* and click the Advance Registration link underneath the RSNA 2007 logo.

1 Information from the Mailing Information page will be used to create your name badge and send documents prior to the meeting.

2 On the Registration page, choose one registration category and a subspecialty, if applicable.

3 Booking your hotel reservations during registration gives you a choice of more than 60 hotels offering the lowest rates in Chicago and access to RSNA's free shuttle to McCormick Place. Indicating your arrival and departure dates and type of room desired will give you a list of hotels meeting the criteria.

4 At the Payment Information screen, confirm your registration and housing selections are correct, enter your credit card information and click Continue.



connections

Your online links to RSNA

RSNA.org

Radiology Online
RSNA.org/radiologyjnl

Radiology Manuscript Central
RSNA.org/radiologyjnl/submit

RadioGraphics Online
RSNA.org/radiographics

RSNA News
rsnanews.org

Education Portal
RSNA.org/education

RSNA CME Credit Repository
RSNA.org/cme

CME Gateway
CMEgateway.org

RSNA Medical Imaging Resource Center
RSNA.org/mirc

RSNA Career Connection
RSNA.org/career

RadiologyInfo™
RSNA-ACR patient information Web site
radiologyinfo.org

RSNA Press Releases
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Medical Meetings

June – July 2007

JUNE 1–4

American Society of Radiologic Technologists (ASRT)/ Association of Educators in Imaging and Radiologic Sciences (AEIRS), Annual Conference, Hyatt Regency Albuquerque, N.M. • www.asrt.org

JUNE 1–5

American Society of Clinical Oncology (ASCO), 43rd Annual Meeting, McCormick Place, Chicago • www.asco.org

JUNE 2–6

SNM, Annual Meeting, Washington Convention Center • interactive.snm.org

JUNE 3–7

European Society of Pediatric Radiology (ESPR), 44th Annual Congress, The Meliá Barcelona Hotel, Spain • www.espr2007.info

JUNE 7–10

Society for Imaging Informatics in Medicine (SIIM), Annual Meeting, Rhode Island Convention Center, Providence • www.sim2007.org

JUNE 7–10

Caribbean Society of Radiologists, 14th Congress, Grand Barbados Beach Resort, Carlisle Bay • www.csor.org

JUNE 9–14

American Society of Neuroradiology (ASNR), 45th Annual Meeting and Neuroradiology Education and Research Foundation Symposium 2007, Hyatt Regency Chicago • www.asnr.org/2007

JUNE 11–13

UK Radiological Congress (UKRC), Annual Meeting, G-MEX and Manchester International Convention Centre, United Kingdom • www.ukrc.org.uk

JUNE 15–16

American Society of Interventional and Therapeutic Neuroradiology (ASITN), 5th Annual Practicum, Sheraton Chicago Hotel & Towers • www.asitm.org

JUNE 21–24

Clinical Magnetic Resonance Society (CMRS), Annual Meeting, Hilton La Jolla Torrey Pines, California • www.cmrs.com

JUNE 23–27

International Stereotactic Radiosurgery Society (ISRS), 2007 Congress and Exhibition, Palace Hotel, San Francisco • www.isrs2007.org

JUNE 27–30

Computer Assisted Radiology and Surgery (CARS), 21st International Congress and Exhibition, International Congress Center, Berlin • www.cars-int.org

JUNE 28–JULY 1

Canadian Association of Radiologists (CAR), Annual Meeting, St. John's, Newfoundland • www.car.ca

JUNE 29–30

RSNA, Tools for Success in the Practice of Radiology, RSNA Headquarters, Oak Brook, Ill.
• RSNA.org/education/RSNA_shortcourses.cfm

JULY 8–12

American Healthcare Radiology Administrators (AHRA), Annual Meeting and Exposition, Gaylord Palms Hotel, Orlando, Fla. • www.ahraonline.org

JULY 13–14

American Institute of Ultrasound in Medicine (AIUM), Hands-on Musculoskeletal Ultrasound: Diagnostic and Interventional Techniques, Mayo Clinic and Kahler Grand Hotel, Rochester, Minn. • www.aium.org

JULY 20–21

American Brachytherapy Society (ABS), GYN School, Knickerbocker Hotel, Chicago • www.americanbrachytherapy.org

JULY 22–26

American Association of Physicists in Medicine (AAPM), 49th Annual Meeting, Minneapolis Convention Center • www.aapm.org/meetings/07AM

NOVEMBER 25–30

RSNA 2007, 93rd Scientific Assembly and Annual Meeting, McCormick Place, Chicago • RSNA2007.RSNA.org

FEBRUARY 18–20, 2008

RSNA Highlights™, Ritz-Carlton/JW Marriott Orlando, Grande Lakes, Florida • RSNA.org/Highlights

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