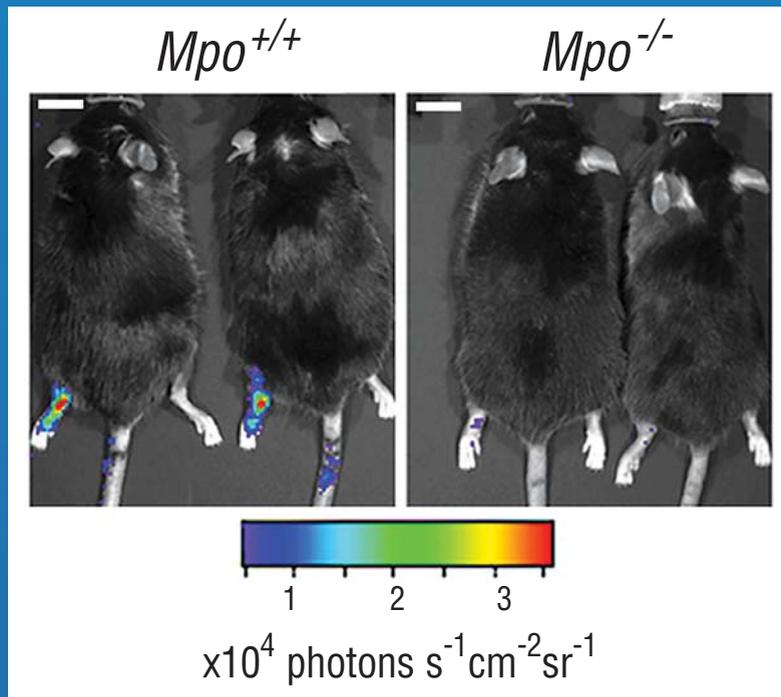


# RSNA® *News*



## Crime Scene Compound Shines Light on Immune Inflammation

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- Brain Imaging Discoveries Translated into Practice at New Center
- Teleradiology Ushering in New, Subspecialized Era
- Malpractice Fears in Mammography Overestimated
- Grant Recipient Pioneers Research in Breast Tomosynthesis

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## Hitachi to Donate \$300,000 to R&E Foundation

**H**ITACHI MEDICAL CORP., based in Tokyo, has committed to donating \$300,000 to the RSNA Research & Education (R&E) Foundation to endow a new research seed grant every other year for 20 years.

“Hitachi Medical Systems is pleased to further our support in funding of RSNA R&E Foundation activities toward the advancement of medical imaging,” said Sheldon Schaffer, vice-president and general manager of MR/CT products at Hitachi. “These activities are extremely important towards

advancing the future of radiology, as emerging researchers and educators and the medical imaging community, collectively, seek out new technologies and their applications toward ever better, comprehensive and efficient solutions for the diagnosis and treatment of disease.”

Hitachi has been a member of the R&E Vanguard Program since 1999 and currently supports Research Seed and Research Resident Grants. The

Vanguard Program currently includes 14 companies that have committed more than \$21 million to support R&E Foundation grants.

Hitachi’s commitment will support the R&E Foundation’s Silver Anniversary Campaign, which has raised \$14.3 million toward its \$15 million goal. For more information on supporting the campaign, which will finish at the end of 2009, go to [RSNA.org/Campaign](http://RSNA.org/Campaign).

**HITACHI**  
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### CTC Advocates Object to CMS Denial of Coverage

Legislators, advocacy groups and the American College of Radiology (ACR) are among those objecting to the May 12 decision by the Centers for Medicare and Medicaid Services (CMS) to deny Medicare coverage for CT colonoscopy (CTC). An ACR statement asserted that the decision “may result in tens of thousands of unnecessary deaths each year from colorectal cancer, particularly among minority and underserved populations.”

A letter to CMS from Representatives Kay Granger (R-Texas), Patrick Kennedy (D-RI) and 40 other members of Congress stated CMS is missing “a landmark opportunity to positively impact colorectal cancer screening rates.” A statement from the Colon Cancer Alliance read: “Making virtual colonoscopy more easily available as an alternative to standard colonoscopy would be an important tool that ultimately motivates more Americans 50-plus (45 in certain minorities) to undergo a screening they might otherwise skip. Improved access to virtual colonoscopy has the potential to increase screening rates enough to save both lives and money.”

A summary of the CMS decision is available at [www.cms.hhs.gov/mcd/viewdecisionmemo.asp?id=220](http://www.cms.hhs.gov/mcd/viewdecisionmemo.asp?id=220).

### SCCT Publishes Coronary CT Angiography Guidelines

The Society of Cardiovascular Computed Tomography (SCCT) published CT angiography performance guidelines in the May/June issue of the *Journal of Cardiovascular Computed Tomography*. In addition to clinical competency, the SCCT guidelines specify that physicians should have adequate knowledge of the “as low as reasonably achievable” principle for radiation exposure and be able to explain several dose reduction strategies.

The guidelines include recommendations for physician and technologist competencies, institution and scanner standards, patient screening and preparation, patient positioning, contrast injection protocols, coronary CT angiography acquisition and image reconstruction and post-processing.

View the guidelines at [www.scct.org/pressroom/performance\\_guidelines.pdf](http://www.scct.org/pressroom/performance_guidelines.pdf).

### NIH Opens Center for Interventional Oncology

A new Center for Interventional Oncology at the National Institutes of Health (NIH) Clinical Center offers a venue for investigating precisely targeted, minimally invasive, imaging-based cancer therapies. The center is a collaborative effort of the National Cancer Institute, NIH Clinical Center and National Heart, Lung and Blood Institute.

The center will encourage collaborative efforts in medical, surgical and

radiation oncology and interventional radiology, focusing on localized treatment and drug delivery using advanced MR imaging, PET and CT. Researchers will investigate techniques including high-intensity focused ultrasound, freezing, microwave and radiofrequency ablation. The investigation will also expand to electroporation—using electricity to

make cells more open to targeted drug delivery.

The center will also provide educational and training opportunities for oncologists to learn about imaging-based treatments and for interventional radiologists to gain formal training in oncology.

For more information, go to [clinicalcenter.nih.gov](http://clinicalcenter.nih.gov).



## CMS Reviews Coverage for (FDG) PET Cervical Cancer Staging

In response to a formal request by two radiologists, the Centers for Medicare and Medicaid Services (CMS) has opened a review of its coverage policies for fluorodeoxyglucose (FDG) PET cervical cancer staging. The request was made by Perry W. Grigsby, M.D., M.B.A., a professor of radiation oncology and radiology, and Barry A. Siegel, M.D., a professor of radiology and medicine and director of the Division of Nuclear Medicine, both at Washington University in St. Louis. Dr. Siegel is a member of the *RSNA News* editorial board.

Current CMS policy covers FDG PET for monitoring treatment response to cervical cancer. All other uses are limited to women enrolled in a prospective clinical study under the CMS Coverage with Evidence Development (CED) program. Drs. Grigsby and Siegel have asked CMS to cover FDG PET more broadly—without the CED restriction—for staging in women diagnosed with cervical cancer but who do not otherwise meet the coverage criteria. “The requestors also ask

that the use of FDG PET be nationally noncovered to make the diagnosis of cervical cancer, as FDG PET imaging is not helpful to make the initial diagnosis,” the CMS summary noted.

The expected national coverage analysis review completion date is Feb. 6, 2010. The decision tracking sheet is available at [www.cms.hhs.gov](http://www.cms.hhs.gov).



## PEOPLE IN THE NEWS

## Hattery Among ACR Gold Medalists

**2006 RSNA President Robert R. Hattery, M.D.**, was among the 2009 gold medal award recipients at the American College of Radiology’s (ACR) annual meeting. A clinical professor of diagnostic radiology at the University of Arizona in Tucson, Dr. Hattery spent 30 years at the Mayo Clinic in Rochester, Minn., where he is a professor emeritus. Dr. Hattery also served on the editorial board of *RadioGraphics* and as a scientific reviewer for *Radiology*. Other gold medal recipients were **James P. Borgstede, M.D.**, and **William J. Casarella, M.D.** Dr. Borgstede, who served as ACR president from 2006 to 2007, is an associate professor and vice-chair of the Department of Radiology at the University of Colorado in Denver and currently serves on RSNA’s Research & Education (R&E) Foundation Board of Trustees. During his 40-year career, Dr. Casarella, professor and chair of the Department of Radiology at Emory University School of Medicine in Atlanta, has influenced education, practice standards, research and the application of imaging technologies.



**Robert R. Hattery, M.D. James P. Borgstede, M.D. William J. Casarella, M.D.**



**Christian J. Herold, M.D.**

### Herold Named ESR President

The European Society of Radiology (ESR) has named **Christian J. Herold, M.D.**, its new president. A professor of radiology and chair of the Department of Radiologic Clinics at the Medical University Vienna and Vienna General Hospital, Dr. Herold is the first Austrian radiologist to preside over ESR. Dr. Herold, who was named an RSNA honorary member in 2007, is former chair and a current member of the RSNA International Advisory Committee.

## Thoracic Imaging Journal Names New Editorial Staff

*The Journal of Thoracic Imaging (JTI)*, the official journal of the Society of Thoracic Radiology, the Japanese Society of Thoracic Radiology and the Korean Society of Thoracic Radiology, has named new editorial members. **Phillip Boiselle, M.D.**, director of thoracic imaging and associate chief of administrative affairs in the Department of Radiology at Beth Israel Deaconess Medical Center in Boston and an

associate professor at Harvard Medical School, is the new editor-in-chief. **Gautham Reddy, M.D., M.P.H.**, a professor of radiology and vice-chair for education in the Department of Radiology at the University of Washington School of Medicine and director of thoracic imaging at the University of Washington Medical Center, Harborview Medical Center, and the Seattle Cancer Care Alliance, all in Seattle, is

the new deputy editor. Named associate editors were **U. Joseph Schoepf, M.D.**, a professor in the Department of Radiology at the University of South Carolina in Charleston and **Jane Ko, M.D.**, an associate professor of radiology at the New York University School of Medicine.

## Hallahan to Head Radiation Oncology at WUSTL

**Dennis E. Hallahan, M.D.**, has been chosen to head the Department of Radiation Oncology at Washington University School of Medicine in St. Louis (WUSTL). Dr. Hallahan, who previously served as the Ingram Professor of Cancer Research and chair of the Department of Radiation Oncology at Vanderbilt University in Nashville, Tenn., was also named the first Elizabeth H. and James S. McDonnell III Distinguished Professor in Medicine, a newly endowed chair at WUSTL. He will also serve on the Senior Leadership Committee at the university's Siteman Cancer Center.



Dennis E. Hallahan, M.D.

## Lauterbur Award Presented to Vasanawala

**Shreyas Vasanawala, M.D., Ph.D.**, co-director of pediatric MR imaging at Lucile Packard Children's Hospital in Palo Alto, Calif., and an assistant professor of pediatric radiology at the Stanford University School of Medicine, has been awarded the Lauterbur Award by the Society of Computed Body Tomography & Magnetic Resonance. This is the first time the award, presented annually for best original research in MR imaging, has recognized fundamental research performed by a faculty member at a children's hospital.



Shreyas Vasanawala, M.D., Ph.D.

## Zerhouni Returns to Johns Hopkins as Senior Advisor

**Elias A. Zerhouni, M.D.**, former director of the National Institutes of Health (NIH), has returned to Johns Hopkins Medicine in Baltimore to serve as a senior advisor. Dr. Zerhouni, who led NIH from 2002 to 2008, formerly served as executive vice-dean for Johns Hopkins, where he was instrumental in the creation of the Institute for Cell Engineering. Dr. Zerhouni also served as a professor of radiology and biomedical engineering and chair of the Department of Radiology at the medical center.



Elias A. Zerhouni, M.D.

## Wallner Named ABR Associate Executive Director for Radiation Oncology

The American Board of Radiology (ABR) has named **Paul E. Wallner, D.O.**, associate executive director for radiation oncology. Dr. Wallner, senior vice-president for medical affairs for 21st Century Oncology and Radiation Therapy Services in Ft. Myers, Fla., will participate in agenda setting for ABR Board of Trustees meetings, represent ABR at societies and organizations, review candidate and diplomate requests and assist in planning ABR's exams of the future in initial certification and maintenance of certification programs.



Paul E. Wallner, D.O.

## Sandler Receives Inaugural Chair at Cedars-Sinai

Howard M. Sandler, M.D., chair of radiation oncology at Cedars-Sinai Medical Center's Samuel Oschin Comprehensive Cancer Institute, has been named the inaugural Ronald H. Bloom Family Chair Holder in Cancer Therapeutics. The endowed chair will support research into new treatments for cancer.

## MAMMOGRAPHY

# Tip of the Month

Speck artifacts on a screen-film mammography image, often attributed to processor pickoff, are frequently due to small pieces of debris on the screen not easily seen with the naked eye or old screens that have developed small defects.

American Association of Physicists in Medicine



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## MY TURN

# Questionable Radiologic Abnormality: To Disclose or Not to Disclose — That is the Question

*To be, or not to be: That is the question. ... Conscience does make cowards of us all.*

-HAMLET

**P**ICTURE THIS: A radiologist performing a routine sonogram during a woman's 18th week of pregnancy notices questionable findings of osteogenesis imperfecta (OI) but informs the patient that the sonogram is normal. A 27-week sonogram, however, indicates clear-cut evidence of OI. The parents learn that the radiologist did not disclose his original suspicion and file a "wrongful birth" malpractice lawsuit, alleging that if they had known, they would have terminated the pregnancy. The parents' attorney tells the jury, "When a physician withholds information from a patient, that's malpractice."

The scenario is the plot of Jodi Picoult's novel, "Handle with Care." The book is fiction but "wrongful birth" lawsuits are not. Litigation arising from a physician's failure to apprise parents of debilitating congenital abnormalities, thus precluding consideration of abor-

tion or in-utero corrective surgery, is on the rise.

Radiologists observe questionable abnormalities on all types of studies. The nodule in the fifth interspace on a chest radiograph is almost certainly a nipple, and a localized kidney bulge seen on abdominal CT is a normal contour, or are they small tumors? Infinite "variations of normal" could represent small malignancies or early manifestations of disease.

Should radiologists ignore all questionable abnormalities, reporting only those they reasonably believe are significant?

Courts have held that radiologists should anticipate patients wanting to be informed of any abnormality. Regarding obstetrical sonographic findings extremely unlikely to represent significant abnormalities, Roy Filly, M.D., of



Leonard Berlin, M.D.

the University of California in San Francisco, wrote: "Should I have the courage of my conviction to simply ignore these features? I wish I had that courage but I don't. Even with my considerable clout in the world of obstetrical sonography, I cannot unilaterally ignore them. That is not how American medicine works."

Dr. Filly is correct. Notwithstanding Shakespeare's observation that "Conscience does make cowards of us all," I suggest that the question in the title of this column be answered affirmatively.

*Leonard Berlin, M.D., is a professor of radiology at Rush Medical College in Chicago and vice-chair of the Department of Radiology at NorthShore University HealthSystem – Skokie Hospital in Skokie, Ill. Dr. Berlin, who chairs the RSNA Professionalism Committee, discusses the impact of medical malpractice on breast imaging in a feature on Page 12.*

### My Turn ONE RADIOLOGIST'S VIEW

# Throw away the book



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# Crime Scene Compound Shines Light on Immune Inflammation

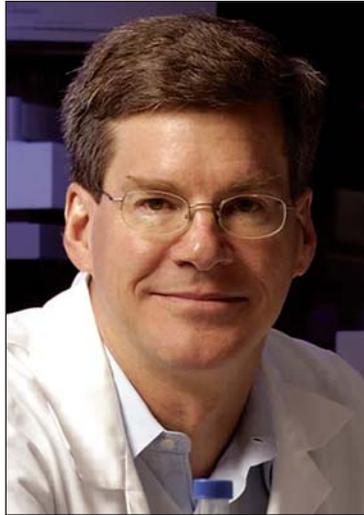
**Y**OU'VE SEEN IT ON TV shows like "CSI" — a compound known as luminol, sprayed at crime scenes to make blood glow. Today researchers are examining potential uses for luminol in detecting immune inflammation in living animals and say the compound could eventually make its way to clinical application.

The lead author of a new study on bioluminescence imaging (BLI) published in the April 2009 issue of *Nature Medicine*, David Piwnica-Worms, M.D., Ph.D., a professor of radiology and director of the Molecular Imaging Center at Washington University School of Medicine in St. Louis, and colleagues injected luminol into living mice and found that the compound glowed blue at sites of active immune inflammation. Most surprisingly, it glowed only when the enzyme myeloperoxidase (MPO) was present.

In blood samples *ex vivo*, researchers noted that luminol is known to be a responsive indicator of a process known as oxidative

burst. "This involves the production of hypochlorous acid, a strong oxidizing agent commonly known as bleach," said Dr. Piwnica-Worms.

"Part of the function of activated macrophages and neutrophils—two special types of white cells—is to engulf invading bacteria into a special vesicle inside the cells called the phagosome," he continued. "In the phagosome, when activated, the cells will secrete myeloperoxidase—which will, in that environment, catalyze the reaction of hydrogen peroxide



**David Piwnica-Worms, M.D., Ph.D.**  
Washington University School of Medicine



**John W. Chen, M.D., Ph.D.**  
Massachusetts General Hospital and Harvard Medical School

and chloride to make hypochlorous acid. And then it kills the bacteria with that 'bleach' inside these phagosomes."

## **In Vivo Sensitivity, Specificity Achieved**

To determine whether luminol, *in vivo*, might be specific and sensitive

*You systemically inject luminol like any compound or drug and it distributes diffusely throughout the body, but you will only see the light where you see the activated MPO.*

**David Piwnica-Worms, M.D., Ph.D.**

for MPO activity, researchers injected luminol into the peritoneal cavity of living normal and MPO gene-deleted mice. From there the compound circulated into the bloodstream.

"You systemically inject luminol like any compound or drug and it distributes diffusely throughout the body, but you will only see the light where you see the activated MPO—that is where there are areas of inflammation indicating activated neutrophils and macrophages,"

said Dr. Piwnica-Worms.

"In some ways it might have been expected that you would get some signal from the luminol, based on prior literature," he continued. "What did surprise us were the sensitivity and the MPO specificity *in vivo*. There was no signal emitted from the MPO gene-deleted mice."

In researching imaging MPO activity for MR and nuclear imaging, John W. Chen, M.D., Ph.D., an assistant professor of radiology in the Division of Neuroradiology and the Center for Molecular Imaging Research at Massachusetts General Hospital and Harvard Medical School, both in Boston, has developed activatable imaging agents that can be modified by MPO, resulting in a substantially higher signal. Dr. Chen recently demonstrated that these agents could be used to sensitively and specifically detect MPO activity *in vivo* in mouse models of heart attack, multiple sclerosis and stroke.

Dr. Chen noted that luminol has

not been known to be specific to MPO in vitro, but the study by Dr. Piwnica-Worms and colleagues demonstrated that in vivo luminol is specific to MPO. “What causes this difference in MPO selectivity in vitro versus in vivo is very interesting and needs further investigation,” he said.

While luminol has been used extensively in forensic investigations, its toxicity needs to be assessed when administered to humans in doses required for imaging, Dr. Chen added.

### Bright Future Envisioned for Clinical Application

Although clinical application of luminol in detecting immune inflammation is a long way off, it does offer some intriguing possibilities, such as earlier detection of cardiovascular disease.

“There has been some very provocative data where MPO seems to have an important role in being a marker of active plaque,” said Dr. Piwnica-Worms. “Serum analysis of MPO is currently under active investigation for being a marker of active plaque. If there’s an active plaque, compared to chronic plaque, that’s a sign that there may be pending stroke or heart attack.”

Other possible applications include inflammatory diseases of the brain as well as inflammation of the eyes and lesions of the skin.

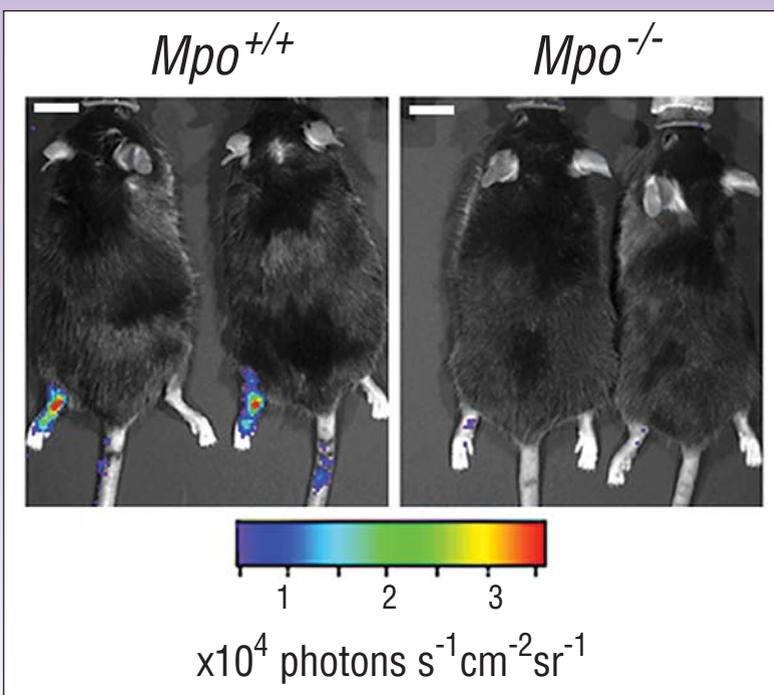
Instruments such as endoscopes and bronchoscopes could be optimized to perform local interrogation in conjunction with systemic injection of luminol, said Dr. Piwnica-Worms. New types of instruments or transducers need to be developed for some potential clinical applications.

Dr. Chen agreed. “Bioluminescence currently has little clinical application because light has limited depth of penetration,” he said. “Therefore, before luminol and bioluminescence can be used in a clinical context, more sensitive and/or specialized equipment needs to be developed that allows human body parts such as the breast to be imaged.

“Despite the lack of depth penetra-

### FROM THE COVER

Researchers who injected luminol into living mice found that the compound glowed blue at sites of active immune inflammation. Lipopolysaccharide (LPS) was injected into the left ankle joint of pairs of wild type ( $Mpo^{+/+}$ ) mice (left panel) or MPO gene-deleted ( $Mpo^{-/-}$ ) mice (right panel). Vehicle (saline) was injected into the right ankle joints. After 48 hours, luminol was administered by intraperitoneal injection (200 mg/kg body



weight) and mice were imaged 10 minutes later with a cooled charge-coupled device (CCD) bioluminescence imaging (BLI) system. Note: The bioluminescence signal emitted from the LPS-induced arthritic joints in  $Mpo^{+/+}$  mice, but not  $Mpo^{-/-}$  mice. Bar = 1 cm.

Image courtesy of David Piwnica-Worms, M.D., Ph.D.

tion of BLI, one can imagine that in the future, luminol/BLI could be used to assess active arthritis,” Dr. Chen continued. “Another example could be endovascular or endoscopic detection of MPO in vascular or gastrointestinal diseases.”

Dr. Piwnica-Worms suggested that for pre-clinical studies and for academic radiologists, there is bound to be some immediate impact in near-term utility for studying diseases in mouse models with a new BLI tool.

“Luminol provides surprisingly sensitive and highly specific bioluminescence readout of MPO and MPO-mediated inflammation in vivo,” he

concluded. “In terms of actual translation to the clinic, there are many barriers, but it does open up the possibility in the future of a new clinical optical imaging application. Stay tuned.” □

### Learn More

■ To view an abstract of the study, “Bioluminescence Imaging of Myeloperoxidase Activity in Vivo,” published in the April 2009 issue of *Nature Medicine*, go to [www.nature.com/nm/journal/v15/n4/abs/nm.1886.html](http://www.nature.com/nm/journal/v15/n4/abs/nm.1886.html).

## Molecular Imaging at RSNA 2009

THE Molecular Imaging Symposium at RSNA 2009 will be held Wednesday, Dec. 2. Topics and presenters include:

- Molecular Imaging: Overview and Basics—Daniel C. Sullivan, M.D.
- Molecular Imaging in Oncology—Richard L. Wahl, M.D.
- Molecular Imaging in Cardiovascular Disease—Pamela K. Woodard, M.D.
- Molecular Imaging in Brain Disorders—Jeffrey R. Petrella, M.D.

Registration for these and all RSNA 2009 courses is under way.

For more information, go to [RSNA2009.RSNA.org](http://RSNA2009.RSNA.org).



# Brain Imaging Discoveries Translated into Practice at New Center

**A**LTHOUGH THE ROAD from medical discovery to clinical delivery is often long and bumpy, translational research can provide the engine to move the process along.

To that end, the Brain Science Institute (BSI) at The Johns Hopkins Institute in Baltimore is underwriting the Center for Brain Imaging Science (CBIS), a new enterprise that aims to channel expertise from various Johns Hopkins imaging centers into creating a surge, university-wide, in the understanding and use of imaging techniques for neuroscience research. The virtual center opened in June.

“There’s a widespread perception that imaging is what drives new discoveries and there is new excitement in brain research,” said John Griffin, M.D., director of BSI. “However, it is hard to have an integrated entry program for imaging. What we set out to do was create a program that would make it easy for neuroscience investigators who wanted to ask questions using imaging to learn the basics about how to do it.” BSI co-directors are Michael Miller, Ph.D., and Marilyn Albert, Ph.D.

Support from BSI will ensure that the new center has the initial resources to develop pilot studies and protocols. The faculty anticipates that approved projects will become self-supporting through grants and other funding.

Through its support of the center,



**John Griffin, M.D.**  
Brain Science Institute at The Johns Hopkins Institute



**Susumu Mori, Ph.D.**  
The Johns Hopkins School of Medicine

BSI leaders plan to leverage improved imaging on their own projects, thus upholding the traditional meaning of “translational” research. Leaders said they hope this paves the way for new

*Researchers are figuring out what clinicians have known for a long time. An imaging test is not like a blood test; you actually need someone to help you interpret it.*

**Gregory Sorensen, M.D.**

therapies for brain diseases and psychological and behavioral disorders.

Bringing together many disciplines from neurology, psychiatry and radiology also creates a core group of experts whose experience can be utilized in ferreting out the best questions and most compelling ideas to benefit patients.

“Right now there is a very high barrier for getting studies started; to knowing where and how to start, who you talk to, and to have the ear of

someone who is an expert in helping decide the best way to ask questions,” said Dr. Griffin.

## Improving Imaging Analysis Critical

Providing training to a new generation of translational researchers is one plan for the new center that leaders find most compelling. Susumu Mori, Ph.D., a professor of radiology at The Johns Hopkins School of Medicine, explained: “Now high-quality MR imaging and PET scanners are available. Their new technology lets users access state-of-the-art capabilities just by pushing buttons. Yet we’re victims of our own success—quality images are so easily generated that the volume overwhelms researchers and clinicians.”

The new bottleneck, Dr. Mori said, lies in not being able to quantify information from a glut of images or interpret it rapidly enough. Access to



The newly opened Center for Brain Imaging Science (CBIS) at The Johns Hopkins Institute aims to channel imaging expertise in the understanding and use of imaging techniques for neuroscience research, said John Griffin, M.D., director of the Brain Science Institute at The Johns Hopkins Institute. Dr. Griffin is pictured (left) at CBIS, with Ahmet Hoke, M.D., Ph.D., an associate professor of neurology and neuroscience at Hopkins.

Image courtesy of The John Hopkins Institute

good image analysis must increase, according to A. Gregory Sorensen, M.D., a professor in the Department of Radiology at Harvard Medical School in Boston.

“Researchers are figuring out what clinicians have known for a long time,” said Dr. Sorensen. “An imaging test is not like a blood test; you actually need someone to help you interpret it. Clinicians know that radiologists often provide high value. This center is basically saying, ‘We researchers need some help too.’”

Dr. Sorensen believes initiatives like the one at Johns Hopkins shine a light on the uneven progress in achieving bench-to-bedside delivery of new science. “Every center wonders how some centers magically take things from lab to clinic on occasion and don’t do it all the time,” he said. “Other centers don’t seem to do it at all. Where is the spark?”

“Devoting resources to the process of getting ideas from one part of the laboratory to a part closer to the clinic is a complicated enterprise,” Dr. Sorensen continued. “These guys are trying what they think might work best in their local environment. It’s testimony to the fact that people are

frustrated because it’s harder than they thought. They’re visionary enough to not throw up their hands but to say, ‘Hey, let’s do something about it.’”

### Researchers Identify Goals

Plans for CBIS include centralizing services for image analysis, particularly for projects with high-quality anatomical images, and opening two image analysis work stations to service research needs.

Once high-quality images are generated, the core of faculty experts serves as a bridge to analysis in several ways. For one, it offers individual and group training in the most widely used image analysis techniques. This educational arm of CBIS will make computers and training available on a daily basis, a service that is expected to generate strong demand within the Hopkins community. Dr. Griffin said competition for training and research dollars within the new center may become fierce.

“The sky’s the limit, and that is actually a problem,” said Dr. Griffin. “As this gets off the ground there will be a need to actively compete to get projects supported by the core. It really

depends on having the resources to do it. We’re able to direct them toward what we think are the best questions that will in effect move the field forward quickly.”

How will the faculty and staff at Hopkins know whether the new center has made a critical difference in bringing research ideas into clinical practice? Dr. Griffin has already identified goals he hopes researchers achieve.

First, he is looking for developments that change thinking within specific fields being investigated. Dr. Griffin said he also hopes, “imaging becomes a true core across the institution—more widely used and more often put into the planning about how to ask questions. We want to end up with a larger core of faculty who are sophisticated in thinking about imaging.” □

### Learn More

■ For more information on the Center for Brain Imaging Science (CBIS) at The Johns Hopkins Institute, visit [www.hopkinsmedicine.org/brainscience](http://www.hopkinsmedicine.org/brainscience).

■ For more information on the National Cancer Institute’s Network for Translational Research: Optical Imaging (NTROI), go to [imaging.cancer.gov/programsandresources/specializedinitiatives/ntroi](http://imaging.cancer.gov/programsandresources/specializedinitiatives/ntroi).

# Teleradiology Ushers in New, Subspecialized Era

**W**ITH NIGHTTIME TELERADIOLOGY use a reality for half of the hospitals in the U.S., radiologists' fears of commoditization are giving way to hope for more streamlined subspecialty reading.

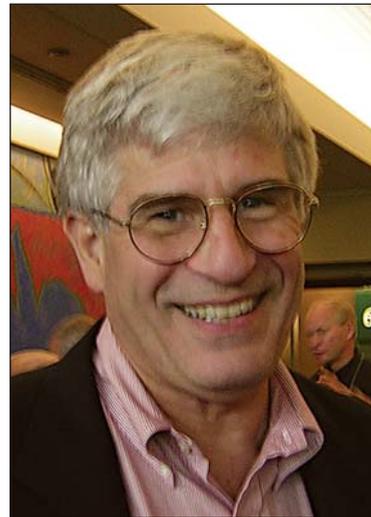
Along with giving institutions access to a greater number of radiologists, teleradiology is finding applications in off-hours coverage and particularly in access to subspecialty expertise, said N. Reed Dunnick, M.D., Fred Jenner Hodges Professor and chair of radiology at the University of Michigan, Dearborn, and science liaison for the RSNA Board of Directors. "It allows us to send images to the most appropriate faculty, regardless of the location of the imaging study," Dr. Dunnick said.

Between 50 and 55 percent of institutions now use some form of off-hours teleradiology service, estimated William G. Bradley Jr., M.D., Ph.D., professor and chair of radiology at the University of California, San Diego (UCSD). "There was a survey a few years ago by the American College of Radiology (ACR) that suggested the number was around 50 percent, though recent studies have found it's a bit higher than that," according to Dr. Bradley, a founder of NightHawk Radiology Service, based in Coeur d'Alene, Idaho, one of the nation's first and largest teleradiology providers and the origin of the industry-wide term "nighthawk."

Dr. Bradley projects that while nighttime teleradiology coverage will likely reach a plateau, outsourcing



**N. Reed Dunnick, M.D.**  
University of Michigan



**William G. Bradley Jr., M.D., Ph.D.**  
University of California, San Diego

studies to subspecialists may become much more common.

### Concern Still Exists

Despite the advantages that have been identified, the thought of widespread teleradiology use still unnerves some radiologists by conjuring images of unregulated readings by overseas practitioners. Dr. Bradley said that's not the case for NightHawk and others in the field.

"Sometimes our offshore teleradiology—a few of our radiologists read from Europe or Australia where it's daytime during nighttime hours in the U.S.—gets lumped in with India, where doctors are willing to read for a lot less than we get paid," Dr. Bradley explained. "But some of those doctors are not board certified," he said, referring to required certification by the American Board of Radiology (ABR). "It may not be legal for

them to read images."

Dr. Bradley served on the ACR Board of Chancellors when it established its teleradiology resolution standards in 2006. "ACR says you need to be board certified, credentialed at the hospital and licensed in the state," he said. "The resolution also speaks out against 'ghost reading,' where you might have one doctor who trained in the U.S. signing reports by 10 doctors who did not, without actually looking at the images."

C. Douglas Maynard, M.D., a professor and chair emeritus of radiology at Wake Forest University School of Medicine in Winston-Salem, N.C., and 2000 RSNA president, wrote in an August 2008 issue of *Radiology* "Controversies" piece: "I am concerned that the improper use of technologies such as PACS and teleradiology ... will provide a mechanism by which radiologists will move from the desired role of consultants to the role of expert image interpreters." In the article, Dr. Maynard cautioned that referring physicians

*The people who complain that teleradiology is commoditizing us are a little late, because PACS already did that.*

**William G. Bradley Jr., M.D., Ph.D.**

could cease to consult with radiologists before or during imaging examinations if radiologists are no longer physically present.

Dr. Bradley said he is also cognizant of the “dark side” of outsourcing, which might enable increased self-referral. “At the same time, it’s contributing to the perception by other physicians and the government that radiologists are overpaid or lazy,” he said. “That’s another discussion, but they only look at the cost of medical imaging. They don’t consider that we don’t do exploratory laparotomies anymore. We don’t admit patients for ‘observation’ like we used to. While the cost of imaging is going up, it’s probably saving money overall.”

With the availability of skilled subspecialists and the technological means to connect them, institutions should have the best of both worlds, said Anand P. Lalaji, M.D., founder and chair of Atlanta-based The Radiology Group. Dr. Lalaji promotes a hybrid model that combines remote and in-house imaging services. The model addresses problems like staff relationship voids, lack of subspecialty access, underutilization of physician extenders, turnaround time and rising costs, he explained in a recent press release.

“The theory at this moment employs a model of ‘whoever is available,’” said Dr. Lalaji. “We should use the technology to route the exam to a specific subspecialist 100 percent of the time, at least during the normal business day.”

Dr. Lalaji also recommends utilizing the services of radiologist assistants to help build staff relationships that may be lacking in a standard teleradiology model. As for cost, Dr. Lalaji said, “Radiologists’ salaries plus benefits are a fixed cost. There is direct savings by reducing the number of onsite radiologists and shifting studies offsite. The offsite reading cost is a very competitive ‘fee per study’ model. This saves the hospital from spending money to manage their radiologists and pay for

malpractice and health benefits.”

### “Commoditization” Reexamined

“The people who complain that teleradiology is commoditizing us are a little late, because PACS already did that,” said Dr. Bradley, who wrote an August 2008 *Radiology* counterpoint to Dr. Maynard’s piece advocating the pros of teleradiology, which prompted a February 2009 Letter to the Editor in *Radiology*, “Radiologists are Physicians, Not Commodities,” by William N. Lisberg, M.D., which stresses the responsibility of interacting with patients and referring physicians.

“Some could say Medicare commoditized us, because you pay a guy fresh out of training the same as you pay somebody with 30 years of experience,” said Dr. Bradley. “With PACS, now that the referring docs can see the images and the report on their computers, they don’t come down to radiology anymore. They don’t know who’s reading. In a sense, we have already become commoditized.”

Dr. Maynard wrote that subspecialization underscores the issue of who is best qualified to read a study. As the medical industry realizes that subspecialization produces better reads, it will mean changes for radiology practices everywhere. “The large groups are already subspecialized,” countered Dr. Bradley. “For smaller groups, that’s not practical.”

The alternative, said Dr. Bradley, is for groups to either utilize a teleradiology company or join forces with their competition to form a large group that can afford its own subspecialists. “I suspect it will be easier to outsource an

occasional difficult musculoskeletal case to a teleradiology company,” he said.

Accountability becomes an issue, wrote Dr. Maynard, as the radiologist becomes less associated with the referring physician and the patient. Dr. Bradley recommends that all teleradiology companies implement quality assurance programs. “UCSD is working with NightHawk on having a random sampling of cases read by our faculty and compared to the actual report. QA measures not only allow radiology groups to compare quality, but just having the nighthawks know they’re being watched will probably improve the quality.”

As radiologists move forward with teleradiology in tow, concerns remain about losing the interpersonal communication that fosters what Dr. Maynard described as the “desired role of the consultant.” Dr. Dunnick advises that radiologists participate in the entire patient care process, including access, scheduling, safety, communication and examination appropriateness.

“Radiologists must ensure the smooth operation of the imaging facility,” said Dr. Dunnick. “We must remember that there is much more to radiology than interpreting the images.” □

### Learn More

- The article, “Radiologists: Physicians or Expert Image Interpreters?” by C. Douglas Maynard, M.D., is available at [radiology.rsnaajnl.org/cgi/reprint/248/2/333](http://radiology.rsnaajnl.org/cgi/reprint/248/2/333).
- The article, “Off-site Teleradiology: The Pros,” by William G. Bradley Jr., M.D., Ph.D., is available at [radiology.rsnaajnl.org/cgi/content/full/248/2/337](http://radiology.rsnaajnl.org/cgi/content/full/248/2/337).
- The Letter to the Editor, “Radiologists are Physicians, Not Commodities,” by William M. Lisberg, M.D., is available at [radiology.rsnaajnl.org/cgi/content/full/250/2/603](http://radiology.rsnaajnl.org/cgi/content/full/250/2/603).

## Teleradiology at RSNA 2009

THE Emergency Series at RSNA 2009 includes the refresher course, “Emergency Radiology Practice Models and Teleradiology,” led by Aaron D. Sodickson, M.D., Ph.D. Along with evaluating the benefits and disadvantages of various emergency radiology practice models, the course will explore the evolving role of teleradiology in the emergency setting. Registration for this and all RSNA 2009 courses is under way. Go to [RSNA2009.RSNA.org](http://RSNA2009.RSNA.org).



# Malpractice Fears in Mammography Overestimated

**R**EPORTS OF long-vacant positions, unfilled fellowships and a growing gap between supply and demand have led mammography experts to an inevitable conclusion about the subspecialty.

“Many radiologists are afraid to go into mammography—or stay in it—out of fear of a potential lawsuit,” said Leonard Berlin, M.D., vice-chair of the Department of Radiology at NorthShore University HealthSystem, Skokie Hospital in Skokie, Ill., and chair of the RSNA Professionalism Committee. “I think there is no question that for the most part, fellowships in mammography remain vacant and many radiologists don’t want to read mammograms.”

Public and private healthcare providers are routinely experiencing multiple mammography vacancies that are often unfilled for lengthy periods, according to Carl J. D’Orsi, M.D., director of the Division of Breast Imaging at Emory Healthcare in Atlanta, and co-chair of the American College of Radiology (ACR) Breast Imaging Commission. “We are down three staff members and have been searching for 18 months to date,” said Dr. D’Orsi.

Although stress, low reimbursement and long hours have likely contributed to waning interest in mammography, Drs. Berlin and D’Orsi believe the threat of litigation is a prime factor. Statistics back up that connection. A February 2009 study, “Workforce Shortages in Breast Imaging: Impact on Mammography Utilization,” in the *American Journal of Roentgenology (AJR)* cites a previous



**Leonard Berlin, M.D.**  
NorthShore University Health-System



**Carl J. D’Orsi, M.D.**  
Emory Healthcare, Atlanta



**R. James Brenner, M.D., J.D.**  
Bay Imaging Consultants

survey showing that 95 percent of radiology residents polled were concerned about malpractice liability in mammography and 65 percent said they would not consider a fellowship in breast imaging if it was offered to them, citing fear of lawsuits as a main reason.

Even though the fear of litigation appears to be a deterrent, new research also published in the February 2009 *AJR* found that radiologists in breast imaging substantially overestimate their actual risk of malpractice lawsuits.

*The quick answer is to simply dismiss the opportunity to change and complain that the risks of malpractice are too high.*

**R. James Brenner, M.D., J.D.**

mouth Medical School in Hanover, N.H., reported that the median estimate for the likelihood of being sued was four times higher than the actual risk, attributing skewed risk perception to a personal malpractice lawsuit or know-

ing a colleague who was sued, anxiety over clinical uncertainty and mass media reports emphasizing errors in breast cancer cases.

## Study Shows Skewed Perception

In the study led by Dr. Dick, radiologists who were mailed surveys in 2002 and 2006 were asked whether they had been named in a malpractice suit and to rate the probability of being the target of a lawsuit in the next five years.

In the 2002 survey, 77 percent of 181 radiologists responded; in 2006, 71 percent of 118 radiologists participated. The study included radiologists at Breast Cancer Surveillance Consortium facilities in Colorado, New Hampshire and western Washington.

On average, radiologists in 2002 rated the likelihood of a lawsuit at 41 percent, while in 2006 the number dropped slightly to 35 percent. But the number who had actually faced a mammography-related lawsuit was much lower. In 2002, 8 percent of respondents had been sued, while in 2006, that number was 10 percent.

Researchers concluded that under-

standing that the actual risk of malpractice suits may be substantially lower than anticipated may help reduce radiologists' fears and alleviate the manpower shortage in mammography.

### Moving Closer to Reality

Dr. Berlin agrees that radiologists' perception of lawsuit risk is skewed, but points out that the public's view of mammography is also unrealistic. "Mammography has been oversold to the public," he said. "Women overestimate their probability of dying of breast cancer by more than 20-fold and the value of screening mammography in reducing that risk by 100-fold."

That has led to a litany of lawsuits, according to Dr. Berlin, who said that relative to all of radiology, missed breast cancer is the leading cause of medical malpractice litigation. And although most cases are settled out of

court, according to Dr. D'Orsi, even so, they can leave a lasting impression.

"In the meantime, the radiologist has been subjected to anxiety for years and is placed in a national database even if the case is won or a pre-trial settlement is reached."

Although the study by Dr. Dick has the potential to alleviate some unrealistic fears about malpractice litigation, it also gives radiologists the opportunity to examine their own conduct in reducing or eliminating malpractice risks, according to one of its authors, R. James Brenner, M.D., J.D., Bay Imaging Consultants, Walnut Creek, Calif.

"The quick answer is to simply dismiss the opportunity to change and complain that the risks of malpractice are too high. Remember that when large-scale screening began, most radiologists had never been formally trained in breast imaging. Today, a

large percentage have been trained in residency, some have specialized and the situation is changing," said Dr. Brenner.

Along with improving expertise, closing the gap between perception and reality for the patient and the public is the only way to reduce lawsuits and renew interest in mammography, said Dr. Berlin. And that can best be achieved through education, he said.

"Only through education will the public understand that the standard of mammographic care is not one of perfection but rather one of reasonableness," he said. "Hopefully then, radiologists will choose the field of breast imaging and gladly continue their involvement in it." □

## "Failure to Communicate" Focus of RSNA 2009 Mock Jury Trial

**H**AS A radiologist who detects possible lung cancer on a patient's X-ray and issues a written report noting the finding and recommending a CT scan adequately fulfilled his responsibility? Or is he obligated to verbally communicate the findings to the referring physician—or the patient?

That was the central question in a malpractice lawsuit filed several years ago by the family of a 55-year-old Chicago man who died of lung cancer about a year after the radiologist recorded the suspicious finding in the man's radiology report but did not verbally communicate it to the referring physician.

The case, whose outcome has already been decided in court, will also be the subject of a mock jury trial to be presented Sunday, Nov. 29, at RSNA 2009.

Leonard Berlin, M.D., who organized and participated in the last RSNA mock trial five years ago, will do so again and serve as the moderator for the case focusing on the "failure to communicate," which is

increasingly becoming a major source of lawsuits against radiologists. "It continues to be a hotly debated subject in courtrooms," he said.

Dr. Berlin's son, Jonathan Berlin, M.D., M.B.A., who portrays the radiologist defendant, said it's critical to spotlight communication—or lack of it—because it hits so close to home for so many radiologists.

"In daily practice it is often difficult to communicate results to referring

physicians in real time," said Dr. Jonathan Berlin, associate professor of radiology at Northwestern University Feinberg School of Medicine in Evanston, Ill. "Referring physi-

cians may be out of town or unavailable, and in such cases communication can be problematic."

The RSNA mock jury trial, to be held in Room S100, will begin at 10:30 a.m. and the verdict will be announced at about 1:30 p.m. A discussion of the case and a Q&A with the audience will follow.

Other participants include presiding

judge, retired Cook County Judge Stuart A. Nudelman; defense attorney, Timothy Nickels, J.D., senior partner at Swanson Martin & Bell in Chicago; and plaintiff's attorney, Thomas Demetrio, J.D., senior partner at Corboy and Demetrio in Chicago. Expert witnesses will be radiologists Richard Cheshbrough, M.D., from Bloomfield Hills, Mich., and Michael Raskin, M.D., from Tamarac, Fla.

Leonard Berlin is also among the presenters of the RSNA 2009 refresher course, "Malpractice Minefields in Radiology: Mammography, Interventional Radiology, and Failure to Communicate." Other presenters include Robert A. Schmidt, M.D., and Robert L. Vogelzang, M.D.

Enrollment for this and all RSNA 2009 courses is under way. For more information, go to [RSNA2009.RSNA.org](http://RSNA2009.RSNA.org).



**Jonathan Berlin, M.D., M.B.A.**  
Northwestern University



# RSNA Grant Recipient Pioneers Research in Breast Tomosynthesis

**C**LINICIANS and radiologists may one day have an important weapon—tomosynthesis imaging biomarkers—in accurately identifying women at high risk for breast cancer thanks to pioneering research by Despina Kontos, Ph.D., integrating computer and radiologic science.

Although her most recent grant was awarded in April through the U.S. Department of Defense (DOD) Breast Cancer Research Program, Dr. Kontos' initial work pioneering the investigation of tomosynthesis imaging biomarkers for breast cancer risk was funded through Research Fellow grants awarded by the RSNA Research & Education Foundation.

"I'm investigating the use of tomosynthesis imaging as a predictive biomarker for the risk of developing breast cancer and ultimately hope to incorporate these quantitative measures into the current gold standard risk-assessment models to improve their predictive accuracy," said Dr. Kontos, a postdoctoral fellow and research associate in the Department of Radiology at the University of Pennsylvania. "Breast tomosynthesis is believed to have the potential to replace mammography in regular breast cancer screening."

Although current National Cancer Institute risk-assessment models can tell clinicians that 11 of 100 women in the population will get breast cancer, "The models are not able to identify which individual women will actually develop breast cancer," Dr. Kontos said. "That

is not very useful for clinicians in their screening practices.

"The methods I'm proposing are fully automated in the sense that they could be used as adjunct software tools on the already existing mammography workstation platform," Dr. Kontos continued. "The work is translational in its approach, trying to incorporate these measures ultimately in the clinical practices and the routine mammographic examinations."

Dr. Kontos used initial grants—an Agfa HealthCare/RSNA Research Fellow Grant in 2006 and a Siemens Medical Solutions/RSNA Research Fellow Grant in 2007—to develop image analysis methods and to test preliminary pilot risk assessment models specific to breast tomosynthesis.

She has continued her research through other grants including a two-year postdoctoral fellowship from the Susan G. Komen for the Cure Foundation that builds on her RSNA-funded research to further evaluate and refine the risk-prediction models. Her latest U.S. Department of Defense Breast Cancer Research Program grant will fund a larger study incorporating quantitative imaging biomarkers for breast cancer risk assessment.

"We started this work from scratch using RSNA money," Dr. Kontos said. "RSNA R&E Foundation grants paved the way for everything that came afterward. They helped me develop preliminary data and start a project from



**Despina Kontos, Ph.D.**  
University of Pennsylvania

scratch. They helped accelerate this research very much and also supported my training.

"I was coming from a computer science department and all my training and research up to that point was in science and engineering," she continued. "I really didn't have a lot of experience in clinical research. RSNA really helped me to achieve my vision to become a translational scientist and integrate my imaging science background with medical research," she said.

The combination of computer scientist and medical researcher isn't uncommon in other areas of radiology, such as brain imaging. However, breast imaging is not as integrated, leaving a gap between computer technology and clinical practices, Dr. Kontos said.

"The methods that are really used in clinical practice are more behind in terms of how computer science and imaging science in general have advanced," she said. "I think clinical practice could benefit very much from the advancements so far in the engineering and computer

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*RSNA R&E Foundation grants paved the way for everything that came afterward. They helped me develop preliminary data and start a project from scratch. They helped accelerate this research very much and also supported my training.*

**Despina Kontos, Ph.D.**

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sciences and in the imaging sciences in general to help leverage the amount of data available and to develop quantitative imaging methods.”

Dr. Kontos groundbreaking research is a step in that direction, said R. Nick Bryan, M.D., Ph.D., professor and chair of the Department of Radiology, in the University of Pennsylvania Health System.

“Dr. Kontos has taken a basic observation, that increased breast density is a risk factor for breast cancer, and developed a sophisticated but practical way to quantify mammographic breast density and build it into a personalized algorithm for breast cancer risk,” said Dr. Bryan. “This research required that she apply her skills in computer science to a daily problem in the field of medicine, of which she had no experience.”

### The Move Toward Quantitative Imaging

In that regard, Dr. Kontos pointed to the RSNA Quantitative Imaging Biomarkers Alliance (QIBA), which unites researchers, healthcare professionals and industry members to advance quantitative imaging and the use of biomark-

ers in clinical trials and practice and develops protocols to standardize the biomarkers across different platforms.

“QIBA stresses the importance of moving more toward quantitative imaging, which is basically what we—the computer scientist and engineer and the imaging science people—bring to the table,” said Dr. Kontos, a QIBA member.

“From being part of this alliance, I am trying to learn and understand what is needed in the field so I can better contribute in the future and grow my research program,” she said.

In her latest study, Dr. Kontos is investigating how women who are at high risk of estrogen-receptor positive (ER+) breast cancer could benefit from selective estrogen receptor modulator chemoprevention drugs. Because no method exists to accurately identify these women in advance, ER status can only be assessed with a biopsy after breast cancer is already diagnosed.

Dr. Kontos said she hopes that landing the extremely competitive DOD grant demonstrates the potential of her ideas.

“The grant is supposed to fund only high-risk, high-gain ideas that have no

previous evidence,” Dr. Kontos said. “It has to be an out-of-the-box idea for them. And it’s blinded in the review. The reviewers don’t know who I am or what institution I’m coming from, so they are only evaluating the idea.

“It definitely gives me confidence in the ideas and shows they are innovative with potential for significant clinical impact in the future,” she concluded. “It’s also helping me as a junior investigator to start my research program and to develop a line of research that is going to grow and expand in the future.” □

### Learn More

■ Dr. Kontos’ 2006 RSNA grant-supported study, “Breast Percent Density: Estimation on Digital Mammograms and Central Tomosynthesis Projections,” appears this month in *Radiology* at [RSNA.org/radiology](http://RSNA.org/radiology). Other authors include three past RSNA grant recipients, Predrag R. Bakic, Ph.D., Ann-Katherine Carton, Ph.D., and Andrew D.A. Maidment, Ph.D., as well as Cuiping Zhang, Ph.D., and Andrea B. Troxel, Sc.D. All authors are from the University of Pennsylvania.

#### NAME:

Despina Kontos, Ph.D.

#### GRANTS RECEIVED:

2006 Agfa HealthCare/RSNA Research Fellow Grant, \$50,000

2007 Siemens Medical Solutions/RSNA Research Fellow Grant, \$50,000

#### STUDIES:

“Analysis of Parenchymal Patterns of Breast Tomosynthesis Images” (2006) and “Computer-Assisted Risk Estimation (CARE) from Breast Tomosynthesis Images” (2007)

#### CAREER IMPACT:

Dr. Kontos said the RSNA R&E grants set her course by allowing her to develop sufficient preliminary evidence to start a project from scratch and submit additional grant applications. The completed research and training gave her the opportunity to undertake postdoctoral training at a cutting-edge research institution like the University of Pennsylvania. This year, Dr. Kontos served on the R&E Research Study Section which allowed her to share insight about her history as a past grant recipient.

#### CLINICAL IMPLICATIONS:

Integrating her computer science background with radiologic science and clinical research, Dr. Kontos’ research has helped pioneer the investigation of tomosynthesis imaging biomarkers and is among the first to explore the potential advantages of tomosynthesis parenchymal analysis for improved breast cancer risk estimation.



## Grants in Action

For more information on all Foundation grant programs, go to [RSNA.org/Foundation](http://RSNA.org/Foundation) or contact Scott Walter, M.S., Assistant Director, Grant Administration at 1-630-571-7816 or [swalter@rsna.org](mailto:swalter@rsna.org).



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**T**HE Board of Trustees of the RSNA Research & Education Foundation and its grant recipients gratefully acknowledge the contributions made to the Foundation April 18 – May 15, 2009.

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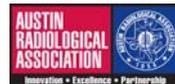
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*Continued on Page 19*

# Journal Highlights

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

## Tracheobronchomalacia in Infants and Children: Multidetector CT Evaluation

**A**LTHOUGH tracheobronchomalacia (TBM) frequently goes unrecognized or is misdiagnosed as other respiratory conditions, multidetector CT enables a comprehensive evaluation of pediatric patients suspected of having TBM by facilitating accurate diagnosis, determining the extent and degree of disease, identifying predisposing conditions and providing objective pre- and postoperative assessments.

In a review article in the July issue of *Radiology* ([RSNA.org/Radiology](http://RSNA.org/Radiology)), Edward Y. Lee, M.D., of Children's Hospital Boston and Harvard Medical School, and Phillip M. Boiselle, M.D., of Beth Israel Deaconess Medical Center and Harvard Medical School in Boston, provide a step-by-step primer on multidetector CT for evaluating infants and children with suspected TBM. Along with reviewing the epi-

miology and pathophysiology of TBM, reviewers discuss:

- Clinical indications
- Patient preparation
- Multidetector CT techniques and protocols
- Postprocessing techniques
- Image interpretation
- Treatment of TBM
- Future directions

"Familiarity with multidetector CT protocols, postprocessing CT imaging methods, and visual and quantitative analysis of the central airways for TBM will enable radiologists to accurately diagnose TBM in infants and children, determine its degree and extent, assess for predisposing conditions, aid in preoperative or preprocedure planning and quantify response of treatment to intervention," the authors conclude.



**Axial CT image obtained at end inspiration in a five-year-old girl shows normal-appearing oval-shaped trachea (T).**

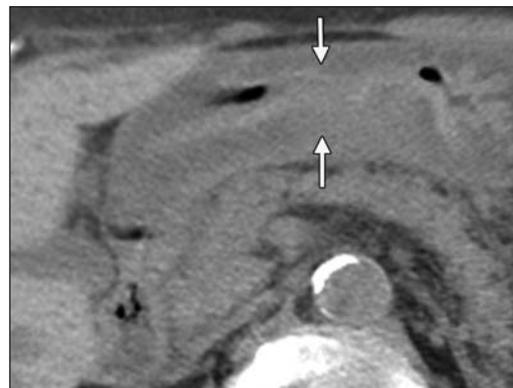
(*Radiology* 2009;252:7-22) © RSNA, 2009. All rights reserved. Printed with permission.

## Imaging of Posttransplantation Lymphoproliferative Disorder after Solid Organ Transplantation

**A**LTHOUGH early diagnosis is critical in treating posttransplantation lymphoproliferative disorder (PTLD), imaging and clinical manifestations vary and are not predictive of histologic findings. Familiarity with risk factors, the imaging appearance

of lesions and pattern of disease based on allograft type can allow a more accurate diagnosis of PTLD which can occur any time after solid organ transplantation and involve any organ.

In an article in the July-August issue of *RadioGraphics* ([RSNA.org/RadioGraphics](http://RSNA.org/RadioGraphics)), Amir A. Borhani, M.D., and colleagues from the Univer-



**Monomorphic PTLD in a 60-year-old man who had undergone renal transplantation 21 years earlier.**

Axial fused PET/CT image shows extensive retroperitoneal lymph node enlargement with increased FDG uptake. The results of biopsy were consistent with monomorphic PTLD.

(*RadioGraphics* 2009;29: 981-1002) © RSNA, 2009. All rights reserved. Printed with permission.

sity of Pittsburgh Medical Center, illustrate and discuss PTLD in terms of:

- Pathogenesis and classification
- Lesion distribution based on transplant type

- Lesion identification in different organs based on imaging appearance
- The majority of PTLD cases are characterized by B-cell proliferation

*Continued on Page 19*

# Radiology in Public Focus

A press release has been sent to the medical news media for the following article appearing in the July issue of *Radiology* ([RSNA.org/radiology](http://RSNA.org/radiology)):

## Rotator Cuff Calcific Tendonitis: Short-term and 10-year Outcomes After Two-Needle Ultrasound guided Percutaneous Treatment: Nonrandomized Controlled Trial

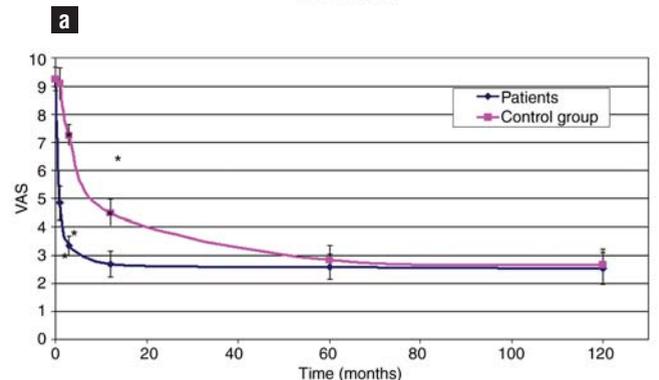
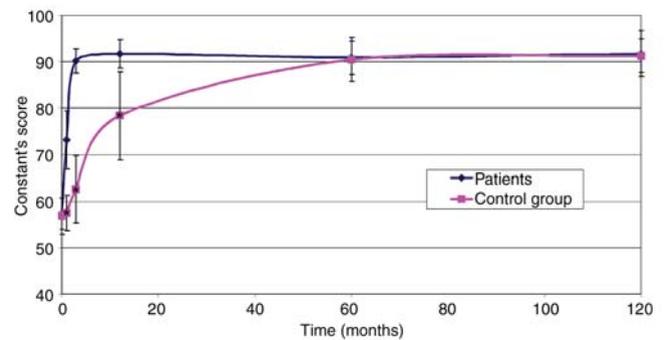
**A** QUICK, LOW-COST treatment with ultrasound guided percutaneous needles provides up to a year of effective pain relief for patients with rotator cuff calcific tendonitis, researchers have found.

Giovanni Serafini, M.D., of the Unit of Radiology at Ospedale Santa Corona in Pietra Ligure, Italy, and colleagues investigated an ultrasound guided treatment under local anesthetic using two 16-gauge needles inserted into the calcium deposit—one needle injecting saline solution, the other retrieving dissolved calcium. Each procedure lasted about 20 minutes.

Exact location and appearance of calcified tendons were determined in advance with ultrasound imaging. Patients were assessed using the Constant Score method consisting of two subjective measurements of pain and its relation to activities of daily living and two objective measurements—strength and range of motion as assessed by a physician. Researchers treated one shoulder in 203 patients and both shoulders in two separate sessions in 16 patients, for 235 shoulders in all. Reassessment was made at one and three months and at one, five and 10 years after treatment.

“Treated patients had a better outcome compared to the control group up to one year, although both groups showed a similar long-term outcome,” Dr. Serafini and colleagues wrote. The procedure provided “a prompt and long-standing recovery as compared with a somewhat longer duration of pain and functional impairment in untreated controls.

“As calcific tendonitis is a self-limited condition, its treatment should be effective, complication-free and minimally invasive,” the researchers conclude. “A two-needle technique for percutaneous ultrasound-guided treatment of rotator cuff tendinitis was an effective, quick and low-cost therapy.”



Graphs illustrate evolution of (a) Constant and (b) VAS scores in patients with rotator cuff calcific tendonitis; 235 shoulders were treated and 68 shoulders were not treated. Data are mean scores  $\pm$  standard deviations. Significant differences (\*) between treated and nontreated patients are illustrated.

(*Radiology* 2009;252:157-164) © RSNA, 2009. All rights reserved. Printed with permission.

## Media Coverage of *Radiology*

In May, media outlets carried 164 news stories generated by articles appearing in the print and online editions of *Radiology*. These stories reached an estimated 65 million people.

May coverage included *Health*, *Washington Woman*, *The Telegraph* (London, U.K.), *Victoria Advocate*, *Daily Sun*

(Orlando), *Plain Dealer* (Cleveland), Marketwatch Radio Network, United Press International, *Scientific American Online*, *Today Online*, *Salon.com*, *CBSNews.com*, *AOL.com*, *Modernmedicine.com* and *Washingtontimes.com*.

## July Public Information Activities Highlight Emergency Radiology

In July, RSNA's "60-Second Check-up" radio program segments will focus on the diagnosis of chest pain in the emergency room and emergency imaging in pediatric patients.

## Imaging of Posttransplantation Lymphoproliferative Disorder after Solid Organ Transplantation

Continued from Page 17

and are related to infection from Epstein-Barr virus. PTLD occurs most frequently in multi-organ transplant recipients, followed by bowel, heart-lung and lung recipients. Authors dis-

cuss the imaging features of PTLD in different organ systems, including intra-abdominal, thoracic, head and neck and musculoskeletal, based on the type of transplant.

“Knowledge of the distribution and

radiologic features of PTLD allows the radiologist to play a pivotal role in making an early diagnosis and in guiding biopsy,” researchers conclude.

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

### “See How It’s Done” with Radiology Online Videos

Beginning this month, videos will accompany some articles in the “How I Do It” section on the *Radiology* Web site at [RSNA.org/radiology](http://RSNA.org/radiology). The first article to include a video is, “Tracheobronchomalacia in Infants and Children: Multidetector CT Evaluation,” by Edward Y. Lee, M.D., Children’s Hospital Boston and Harvard Medical School, and Phillip M. Boiselle, M.D., Beth Israel Deaconess Medical Center, Harvard Medical School, which appears in Journal Highlights on Page 17. The “See How It’s Done,” videos will be archived and available for downloading on the journal’s home page.



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Continued from Page 16

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# Working For You

## Associated Sciences Consortium

RSNA News continues its series highlighting the work of organizations working with RSNA in the Associated Sciences Consortium.

## American Institute of Architects — Academy of Architecture for Health

**A**T NEARLY 64 years of age, the Academy of Architecture for Health (AAH) is the most senior organization within the Washington, D.C.-based American Institute of Architects (AIA) and has a long history of collaborating with RSNA to design physical spaces that work efficiently for patients and healthcare professionals.

“It’s not just how we can build buildings, it’s how we can build buildings that provide better places to heal and take care of patients,” said Morris A. “Mo” Stein, principal/senior vice-president of HKS Architects and director of their Phoenix office. Stein served as AAH president from 1996 to 1997.

AAH hosts seminars and Web-based training for members and pub-

lishes a healthcare research journal, the *Academy Journal*. “We provide instruction in planning proper healing environments that also lead to medical clinical efficiency, in terms of both science and function—air, power, water, size, adjacencies, those kinds of things,” said Stein.

Stein and other AAH members work with RSNA leaders in both partner and client relationships. “Every year people ask me what the heck I’m doing at the RSNA meeting,” he said. “But the clients are there, and we’ve made incredible relationships because of our involvement.” When RSNA opened associate membership to architects, “I jumped at the opportunity to

join,” said Stein, a member of the former RSNA FutuRAD Committee.

Patient safety can be improved by quality design, Stein said, and AAH strives to promote evidence-based practice. “That’s a topic that radiology certainly understands,” he said. “We have a real scientific basis for making decisions about how and what we design in terms of how it will help deliver care. We believe that the architectural world, particularly in health, is at the forefront of that.”

For more information on AIA-AAH, visit [AIA.org](http://AIA.org).



## QIBA Technical Committees Give Progress Report

Three RSNA Quantitative Imaging Biomarkers Alliance (QIBA) technical committees reported progress on projects and goals at a May 19-20 working meeting in Oak Brook, Ill., attended by about 70 representatives from the clinical community, imaging equipment manufacturers, pharmaceutical industry, government and medical informatics companies and imaging societies.

Under the leadership of RSNA Science Advisor Daniel Sullivan, M.D., the meeting included a discussion of

present and future goals for QIBA, whose mission is to help transform radiology from a qualitative to a more quantitative science and improve the value and practicality of quantitative biomarkers by reducing variability across devices, patients and time.

The FDG PET/CT, dynamic-enhanced MR imaging (DCE-MRI) and volumetric CT (vCT) technical committees reported progress in planning the adoption of hardware and software standards to improve accuracy and

reproducibility of quantitative results from imaging biomarkers. Committees are identifying sources of variability, collecting data, devising mitigation strategies and writing and promulgating profiles.

Technical committee reports will be part of the next update at the Quantitative Imaging/Imaging Biomarkers information session at RSNA 2009 on Monday, Nov. 30, at McCormick Place Chicago. A QIBA working meeting will be held Thursday, Dec. 3 at RSNA 2009.



# Program and Grant Announcements

## Advanced Course in Grant Writing

**Application Deadline—July 31**

This course will assist participants, generally junior faculty members, to prepare and submit a quality grant application to the NIH, NSF, or other equivalent institution by the October 2010 NIH deadline. Participant must possess an M.D. or Ph.D., be a faculty member in a radiology, radiation oncology or nuclear medicine program and never have been a principal investigator on an NIH- or NSF-funded project. The course consists of four, two-day sessions spanning an eight-month period, traditionally held at RSNA Headquarters in Oak Brook, Ill. Sessions will be held:

- October 16-17
- January 29-30
- March 19-20
- May 21-22

More information about this program, including the application form, is available at [RSNA.org/research/educational\\_courses.cfm](http://RSNA.org/research/educational_courses.cfm) or by contacting Fiona Miller at [fmiller@rsna.org](mailto:fmiller@rsna.org) or 1-630-590-7741.



## ISR Posts Second Virtual Congress

The second virtual congress has been posted by the International Society of Radiology (ISR) at [www.isradiology.org](http://www.isradiology.org). The all-new content, which includes about 40 lectures by distinguished academic radiologists as well as a number of electronic posters and case reports, was prepared directly for the ISR presentation. The first virtual congress posted in 2007 is also still available on the Web site.

## Revitalizing the Radiology Research Enterprise

**Application Deadline—September 11**

Representatives from radiology, radiation oncology and nuclear medicine are invited to attend a 1½-day workshop on strategies for developing and expanding research programs in radiology and radiation oncology departments. Presentations, case studies and group discussions will be used to nurture radiology cultures that highly value research, and educate radiology leaders in developing research programs and methods

to identify, develop, mentor and reward radiologic and radiation oncologic scientists for research in imaging and image-guided therapy. The workshop will focus topics of general interest but is especially directed toward academic radiology departments not currently in the top tier relative to existing extramural funding.

- Proposed topics include:
- Image research: strategy and models

- Radiology research training
- Case presentations of research program initiatives: impact of internal and external reviews
- Funding sources

Registration forms are available at [RSNA.org/rrre2009](http://RSNA.org/rrre2009). For more information, contact Fiona Miller at 1-630-590-7741 or [fmiller@rsna.org](mailto:fmiller@rsna.org).

## New Days for Financial Seminars at RSNA 2009

**T**WO INVESTMENT SEMINARS will be offered at RSNA 2009. “Effective Real Estate Investment Strategies,” will be presented by J. Michael Moody, M.B.A., on Saturday, Nov. 28, and “Asset Protection and Retirement Planning in the New (Stimulus?) Era,” will be presented by Barry Rubenstein, B.S., J.D., L.L.M., on Monday, Nov. 30. This year’s new two-day format offers attendees more flexibility.

In such challenging financial times, these simple and direct educational seminars specifically tailored for the medical professional will provide attendees with the tools neces-

sary to achieve real estate and investment goals.

To register, go to [RSNA.org/register](http://RSNA.org/register) or use the Registration and Housing Form 1 included in the Advance Registration, Housing and Course Enrollment Brochure. Additional fees apply for these seminars so you must be registered for the annual meeting to sign up. These seminars do not qualify for *AMA*

*PRA Category 1 Credit™*. For more information, contact the RSNA Education Center at 1-800-381-6660 x7772 or e-mail [ed-ctr@rsna.org](mailto:ed-ctr@rsna.org).



# News about RSNA 2009

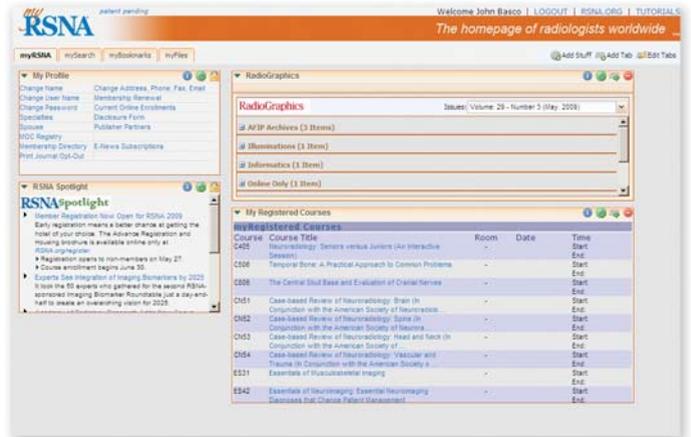
## Track RSNA 2009 Enrollment with myRSNA®

RSNA members can easily track their course enrollment for RSNA 2009 with myRSNA®. Click myRSNA on the top right-hand side of the *RSNA.org* home page.

Once logged on, members who have registered for courses can go to My Profile and select Current Online Enrollments to view their course schedule. The site offers the course numbers, titles, dates, times, locations and course descriptions. Course information will be updated as it becomes available.

Registration for all RSNA 2009 courses is under way. For more information, go to [RSNA2009.RSNA.org](http://RSNA2009.RSNA.org).

Tracking annual meeting course enrollment is one of the many ways myRSNA enables members to find and organize content on *RSNA.org* and throughout the Web. Others include: the MOC Registry, to assist in completing the ABR maintenance of certification process; myCME, to track earned CME and SAMs credits; and Online CME, to view



available programs and SAMs in your declared specialty area(s). Members who don't see these categories on their myRSNA page can add them by clicking Add Stuff on the top right-hand side of the page.

## Enroll Now for Courses

Course enrollment for RSNA 2009 is under way. Online enrollment occurs instantly, while faxed or mailed registration forms are processed in the order they are received. The RSNA 2009 Advance Registration, Housing and Course Enrollment brochure was mailed in late June and is also available at [RSNA.org/register](http://RSNA.org/register). You must be registered for RSNA 2009 in order to enroll for courses.



**CME Update: Earn up to 90.75 AMA PRA Category 1 CME Credits at RSNA 2009**



## Registering for RSNA 2009

There are four ways to register for RSNA 2009:

### 1 Internet—Fastest way to register!

Go to [RSNA.org/register](http://RSNA.org/register)

### 2 Fax (24 hours)

1-800-521-6017  
1-847-996-5401

### 3 Telephone

(Monday–Friday,  
8:00 a.m.–5:00 p.m. CT)  
1-800-650-7018  
1-847-996-5876

### 4 Mail

Experient/RSNA 2009  
568 Atrium Dr.  
Vernon Hills, IL 60061  
USA

## Registration Fees

BY 11/6	ONSITE	
\$0	\$100	RSNA/AAPM Member
\$0	\$0	RSNA/AAPM Member Presenter
\$0	\$0	RSNA Member-in-Training, RSNA Student Member and Non-Member Student
\$0	\$0	Non-Member Presenter
\$150	\$250	Non-Member Resident/Trainee
\$150	\$250	Radiology Support Personnel
\$680	\$780	Non-Member Radiologist, Physicist or Physician
\$680	\$780	Hospital or Facility Executive, Commercial Research and Development Personnel, Healthcare Consultant and Industry Personnel
\$300	\$300	One-day registration to view only the Technical Exhibits

■ For more information about registering for RSNA 2009, visit [RSNA2009.RSNA.org](http://RSNA2009.RSNA.org), e-mail [reginfo@rsna.org](mailto:reginfo@rsna.org) or call 1-800-381-6660 x7862.

# News about RSNA 2009

## Exclusive Airfare Discounts

### Domestic

RSNA has secured a special discount agreement with United Airlines that is not available to the general public. *United.com* offers a 5 percent discount on select United Airlines and United Express qualifying flights.

Use promotional code 553SB to check schedules, make reservations or learn about ticketing information at *United.com*. You can also call United (1-800-521-4041) or your personal travel agent and mention the United promotional code to be eligible for discounted fares.

### International

Receive up to a 20 percent discount with the Star Alliance airline network. Simply call the reservation office of any participating Star Alliance member airline and quote the event code UA11S09. For booking information, go to [www.staralliance.com/conventionsplus](http://www.staralliance.com/conventionsplus).

## Important dates for RSNA 2009

### October 23

International deadline to have full-conference materials mailed in advance

### November 6

Final discounted advance registration, housing and course enrollment deadline, to have full-conference materials mailed in advance

### Nov. 29 – Dec. 4

RSNA 95th Scientific Assembly and Annual Meeting

Register by Nov. 6 to receive the discounted registration fee and full conference materials mailed to you in advance. International visitors must register by Oct. 23 to receive these materials in advance. Registrations received after Nov. 6 will be processed at the increased fee and conference materials must be obtained at the McCormick Place Convention Center. No hotel reservations will be accepted after Nov. 6.

## International Visitors

### International Letters Available—Act Now for Visa

Personalized letters of invitation to RSNA 2009 are available for request at [RSNA2009.RSNA.org](http://RSNA2009.RSNA.org). Click International Visitors. This section of the annual meeting Web site also includes important

information about the visa application process. Visa applicants are advised to apply as soon as they decide to travel to the U.S. and at least three to four months in advance of their travel date. International visitors are advised to begin the visa process now.

## RSNA MEMBER BENEFITS

## Medical Students Investigate Radiology Careers

At the RSNA table at the American Medical Association (AMA) Medical Specialty Showcase in June, radiology residents Venu Vadlamudi, M.D., and Munira Charania, M.D., talked to medical students about careers in radiology. The showcase, held during the AMA Medical Student Section Annual Meeting in Chicago, featured representatives from more than 40 specialties assisting medical students in making career decisions.

Many students were eager to join RSNA upon learning that membership is free for residents, fellows and medical students and includes free admission to the RSNA annual meeting. RSNA members-in-training also receive other member benefits including access to myRSNA, online subscriptions to *Radiology* and *RadioGraphics* and use of the Resident Learning Portfolio.

In an article in the August 2009 issue of *RSNA News*, radiology leaders will discuss the current climate of attracting medical students to the specialty.



# Product News

## FDA CLEARANCE

### Robotic System for Proton Therapy

ProCure Treatment Centers, Inc. ([www.procure.com](http://www.procure.com)) and Ion Beam Applications S.A. ([www.iba.be](http://www.iba.be)) have received FDA clearance for a robotic patient positioning system (PPS) for proton therapy. The PPS is a cost-effective, custom designed medical robot under computer control that decreases the time needed to position patients for proton treatments.

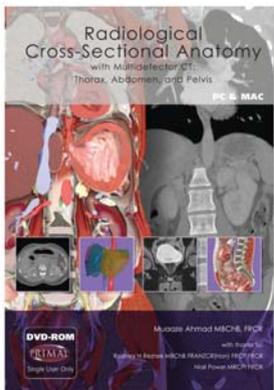
The basic configuration of the robotic PPS is a selective compliant assembly robot arm, that combines commercially available robotic subsystems with custom designed arms. A dual coupler system at the end of the robot's wrist is used to attach different devices, such as a patient table, chair or a test phantom, to the PPS.



## NEW PRODUCT

### Multidetector CT Anatomy Teaching/Reference DVD-ROM

Primal Pictures ([www.primalpictures.com](http://www.primalpictures.com)) has launched "Radiological Cross-Sectional Anatomy with Multidetector CT: Thorax, Abdomen, and Pelvis,"



an interactive DVD-ROM that contains thousands of clear and accurate 3D images in an intuitive digital format, providing users with an invaluable aid

to cross-section anatomy, CT and MR imaging interpretation. Interactive functions allow users to add and remove layers and rotate and label any structure with the click of a mouse.

## NEW PRODUCT

### Pure Web-Based PET/CT Fusion Viewer

SoftStation Web by PETLinQ ([www.petlinq.com](http://www.petlinq.com)) is a pure thin client Web-based application for viewing full PET/CT data sets with fused images requiring only a secure password and login—no downloading is needed. Referring physicians can access reports and view full PET/CT studies via SoftStation Web through their own portal, which includes relevant tools such as SUV/HU, axial, sagittal, coronal data, triangulation, zooming, fusion blend and many others without the need to download datasets or software. Patients can use SoftStation Web to view reports, images and status updates from their physician, schedule appointments online and pay bills through the PETLinQ patient portal.



## NEW PRODUCT

### Movable, Cost-Effective Ferromagnetic Detector

Mednovus, Inc. ([www.mednovus.com](http://www.mednovus.com)) announces the SAFE-SCAN® Intercept Pillar™ ferromagnetic detection system. The new system comprises a pair of independent, freestanding pillar detectors that can be positioned according to the needs of the user. The pillars are lightweight and require only a wall outlet. Intercept Pillar is the first pre-MR imaging pass-through ferromagnetic detector marketed at an introductory price of less than \$10,000, according to the company.

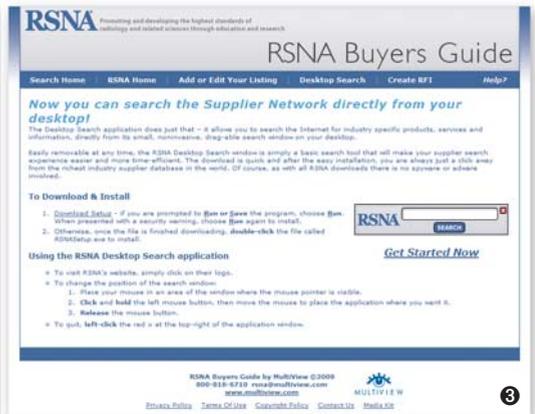


# RSNA.org

## Online Buyers Guide is Direct Link to Products and Services

**A**N ONLINE DIRECTORY of hundreds of companies providing radiology-related products and services, the RSNA Buyers Guide makes it easy to collect and compare details and offerings from competing suppliers. New this year is a product showcase highlighting specific products and special offers. To check out the full array of invaluable Buyers Guide benefits, access the link on the right-hand of the *RSNA.org* homepage or visit *RSNAbuyersguide.com*.

- 1 A keyword-specific search helps users locate companies or products from the richest industry supplier database in the world. Searches can be narrowed by state, city and ZIP code.
- 2 Users can also search categories like management, CT, IT systems, MR imaging systems/MR and radiography. Click a company to link to the vendor's address, telephone and Web site for product information and easy ordering.
- 3 Use the RSNA Desktop Search window for instant, one-click access to the Buyers Guide and Web site at any time. Easily downloadable, the noninvasive, dragable search window can be easily removed at any time.
- 4 Contact participating suppliers with a click of the mouse using the request for information feature.
- 5 A brand new addition—a product showcase—allows suppliers to highlight specific products and special offers on the front page of the guide.



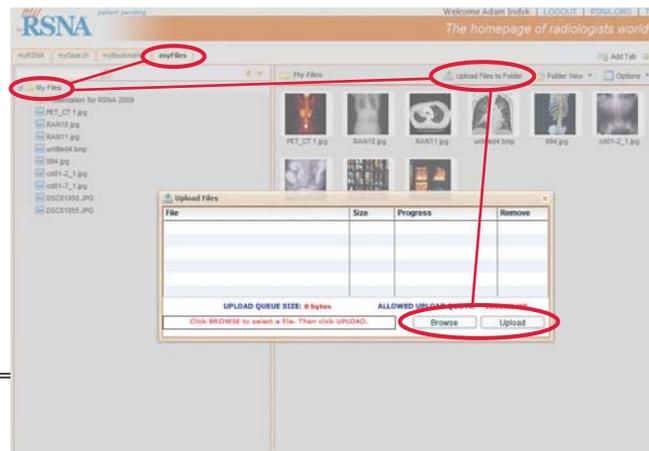
Industry professionals using a Firefox Web browser to search the Buyers Guide can now incorporate the guide's

search engine into their browser's toolbar, making the guide accessible anytime the Firefox browser is open.



### Access Your Media Files

Giving a presentation and don't want to bring your laptop? At *myRSNA.org*, you can upload media files of any type, including PowerPoint presentations, and access those files from any Internet-ready computer in the world. Log onto *myRSNA.org*, go to the myFiles section, select a folder and click Upload Files to Folder. Click Browse, navigate to your presentation file and click Upload. Once the presentation is in myFiles, you can view it from any computer—even without PowerPoint installed. No additional software is needed and each RSNA member receives one gigabyte of storage space.



**CALENDAR**

# Medical Meetings July – October 2009

**JULY 31–AUGUST 2**

Royal Australian and New Zealand College of Radiologists (RANZCR), New Zealand Branch, Annual Scientific Meeting, Te Papa, Wellington, New Zealand • [www.ranzcr2009.co.nz](http://www.ranzcr2009.co.nz)

**AUGUST 13–AUGUST 16**

Malaysian Society of Radiographers, 17th Asia-Australasia Conference of Radiological Technologists, Crowne Plaza Mutiara, Kuala Lumpur, Malaysia • [www.17aacrt.org](http://www.17aacrt.org)

**AUGUST 30–SEPTEMBER 3**

12th World Congress of the World Federation for Ultrasound in Medicine and Biology (WFUMB), Sydney Convention and Exhibition Center, Darling Harbor, Australia • [www.wfumb2009.com](http://www.wfumb2009.com)

**AUGUST 31–SEPTEMBER 5**

International Skeletal Society (ISS), 36th Annual Meeting, The Capital Hilton, Washington, D.C.  
• [www.internationalskeletalsociety.com](http://www.internationalskeletalsociety.com)

**SEPTEMBER 10–13**

European Society of Urogenital Radiology (ESUR), European Symposium on Urogenital Radiology, Royal Olympic Hotel, Athens, Greece • [www.esur2009.gr](http://www.esur2009.gr)

**SEPTEMBER 13–17**

National Cancer Institute (NCI), Academy of Molecular Imaging (AMI) and the Society for Molecular Imaging (SMI), Imaging in 2020: A Conference on Molecular Imaging, Jackson Lake Lodge, Jackson Hole, Wyo. • [www.Imagingin2020.com](http://www.Imagingin2020.com)

**SEPTEMBER 19–23**

Cardiovascular and Interventional Radiological Society of Europe (CIRSE), Annual Scientific and Postgraduate Educational Meeting, Lisbon Congress Center, Portugal • [www.cirse.org](http://www.cirse.org)

**SEPTEMBER 23–26**

AMI, SMI, the European Society for Molecular Imaging (ESMI) and the Federation of Asian Societies for Molecular Imaging (FASMI), World Molecular Imaging Congress 2009, Palais des Congress de Montreal • [www.wmicmeeting.org](http://www.wmicmeeting.org)

**SEPTEMBER 30–OCTOBER 3**

American Society of Emergency Radiology (ASER), Annual Meeting, Loews Royal Pacific Resort, Orlando, Fla. • [www.erad.org](http://www.erad.org)

**OCTOBER 1–3**

European Society for Magnetic Resonance in Medicine and Biology (ESMRMB), 26th Annual Meeting, Maritim Pine Beach Resort, Antalya, Turkey • [www.esmrm.org](http://www.esmrm.org)

**OCTOBER 2–6**

North American Society for Cardiac Imaging (NASCI), 37th Annual Meeting, Omni Orlando Resort at ChampionsGate, Florida • [www.nasci.org](http://www.nasci.org)

**OCTOBER 3–4**

Society for the Advancement of Women's Imaging (SAWI), 2009 Symposium, Westin Chicago River North • [www.sawi.org](http://www.sawi.org)

**OCTOBER 7–11**

American Society of Head and Neck Radiology (ASHNR), 43rd Annual Meeting, Sheraton New Orleans Hotel  
• [www.ashnr.org](http://www.ashnr.org)

**OCTOBER 8–10**

American Society for Clinical Oncology (ASCO), Breast Cancer Symposium: Integrating Emerging Science into Clinical Practice, San Francisco Marriott • [www.breastcasymposium.org](http://www.breastcasymposium.org)

**OCTOBER 10–14**

European Association of Nuclear Medicine (EANM), Annual Congress, Barcelona International Convention Center, Spain  
• [eanm09.eanm.org](http://eanm09.eanm.org)

**OCTOBER 11–13**

Radiology Business Management Association (RBMA), Fall Educational Conference, Sheraton Wild Horse Pass, Chandler, Ariz.  
• [www.rbma.org](http://www.rbma.org)

**OCTOBER 15–17**

Society of Chairs of Academic Radiology Departments (SCARD), Annual Meeting, Fairmont Orchid Hawaii, Kohala Coast  
• [www.scardweb.org](http://www.scardweb.org)

**OCTOBER 16–20 VISIT THE RSNA BOOTH**

Société Française de Radiologie (SFR), Les Journées Françaises de Radiologie (JFR) 2009, Palais des Congrès de Paris  
• [www.jfrepo.com](http://www.jfrepo.com)

**OCTOBER 22–25**

RANZCR/Faculty of Radiation Oncology (FRO)/Australian Institute of Radiography (AIR)/Australasian College of Physical Scientists & Engineers in Medicine (ACPSEM), Combined Scientific Meeting, Brisbane Convention and Exhibition Centre, Australia  
• [www.csm2009.com](http://www.csm2009.com)

**NOVEMBER 29–DECEMBER 4**

**RSNA 2009, 95th Scientific Assembly and Annual Meeting, McCormick Place, Chicago • [RSNA2009.RSNA.org](http://RSNA2009.RSNA.org)**