RSNA News™

May 2012 Volume 22, Number 5

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From Idea to Patent, Radiologist Inventors Share their Insight

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Physician Follow-up Bolsters IVC Filter Retrieval Rate

QPID Search System Quickly Extracts Data in Emergency Departments

Tech Savvy Teachers are Goal of RSNA Workshop

Communication Skills Can Make or Break a Patient-Physician Relationship

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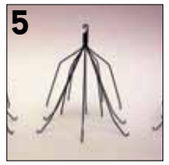
RSNA News™

For more than 20 years, *RSNA News* has provided high-quality, timely coverage of radiology research and education and critical issues facing the specialty, along with comprehensive information about RSNA programs, products and other member benefits.



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At the recent European Congress of Radiology, ECR President Lorenzo Bonomo, M.D., *(far left)* and European Society of Radiology (ESR) President András Palko, M.D., *(right)* awarded gold medals to *(center)*: 2010 RSNA President Hedvig Hricak, M.D., Ph.D., Dr.h.c., *(from left)* Małgorzata Szczerbo-Trojanowska, M.D., Ph.D., Christian J. Herold, M.D., and Iain W. McCall, M.D., D.M.R.D., F.R.C.R.

ESR HONORS DIGNITARIES AT ANNUAL MEETING

The European Society of Radiology (ESR) bestowed honors at the European Congress of Radiology (ECR) held in March in Vienna, Austria.

Gold Medals were awarded to:

- 2010 RSNA President Hedvig Hricak, M.D., Ph.D., Dr.h.c., chair of the Department of Radiology at Memorial Sloan-Kettering Cancer Center, a member of the Molecular Pharmacology and Chemistry Program, Sloan-Kettering Institute, a professor of radiology at the Weill Medical College of Cornell University, and a professor at Gerstner Sloan-Kettering Graduate School of Biomedical Sciences, New York City.
- A past ECR and ESR president, Christian J. Herold, M.D., a professor and chair of the Department of Radiology at the Medical University of Vienna, Vienna General Hospital, director of international affairs at the same institution, and a part-time faculty member of Johns Hopkins University, Baltimore. Dr. Herold received the RSNA Gold Medal in 2007.
- Iain W. McCall, M.D., D.M.R.D., F.R.C.R., a professor of radiological sciences at the University of Keele, Staffordshire, U.K., and a consultant musculoskeletal radiologist at Oswestry's Orthopaedic Hospital, Shropshire, U.K., where he has worked for 33 years. RSNA awarded Dr. McCall Honorary Membership in 2010.
- Past ECR president, Małgorzata Szczerbo-Trojanowska, M.D., Ph.D., a professor and chair of the Department of Radiology at the University Medical School in Lublin, Poland, and head of the Department of Interventional Radiology and Neuroradiology at the Medical University in Lublin.

Honorary membership was awarded to:

- RSNA Immediate Past-president Burton P. Drayer, M.D., the Dr. Charles M. and Marilyn Newman Professor and chair of the Department of Radiology at Mount Sinai School of Medicine and the executive vice-president for risk at the Mount Sinai Medical Center in New York City.
- Giovanni Guido Cerri, M.D., Ph.D., secretary of São Paulo State for Health and director of the Institute of Radiology at the Hospital das Clínicas, School of Medicine, University of São Paulo, Brazil.
- Moshe Graif, M.D., chair of the Department of Medical Imaging at the Tel Aviv Sourasky Medical Center and a professor of medical imaging at the Faculty of Medicine of Tel Aviv University, Israel.

NCRP Issues Commentary on Systems to Detect Radioactive Threat Materials

The National Council on Radiation Protection & Measurements (NCRP) has issued Commentary No. 22, Radiological Health Protection Issues Associated with Use of Active Detection Technology (ADT) Systems for Detection of Radioactive Threat Materials.

The commentary, commissioned by the Defense Threat Reduction Agency, defines the factors to be considered in designing and deploying ADT systems. The NCRP notes that while concerns about radiation exposures are important, there may be times when issues of health effects and privacy need to be carefully balanced with national security concerns. This underscores the importance of obtaining sufficiently accurate information to justify ADT screening, the NCRP notes. The commentary examines the potential radiation doses from ADT systems to operating personnel, bystanders and other individuals in the inspected areas, as well as the design and operational factors that must be considered in assessing the safety and efficiency of ADT systems.

The commentary is available at *NCRPpublications.org*.

MOC News

Continuous Certification to be Phased in for MOC Participants

To keep its reporting clear and prevent unanticipated changes to a diplomate's certification status because they've fallen behind in requirements, the American Board of Radiology has developed a new method of Maintenance of Certification status verification known as "Continuous Certification." All new and maintained certificates will move to the new model this year. Certificates will not display an end date but will instead state that ongoing certification is contingent on meeting MOC requirements. MOC requirements will not change.

The Continuous Certification method uses a look-back period to evaluate all four MOC components and render participation status. This annual look-back will encompass a yearly check of licensure; a rolling three-year check of CME, SAMs and PQI project completion; a rolling 10-year check of exam status; and a rolling two-year check on payment of MOC fees.

Lifetime certificate holders are not required to participate in Continuous Certification. The new process has many benefits:

- Two or more time-limited certificates synchronized into one MOC cycle.
- Unlimited number of CME credits and SAMs that can be counted per year.
- MOC exam may be taken at any time, as long as previous initial certification or MOC exam was passed no more than 10 years ago.
- Built-in "catch-up" period of one year allows time to make up requirements while still being classified as certified.
- ABR will send automatic reminders to help participants avoid the perils of procrastination and stress of trying to meet 10 years' worth of requirements in a short period.
- Lifetime-certified diplomates will not relinquish their original certification but will receive MOC credit as soon as they apply and pay their annual fees.

A diplomate's reported MOC status becomes even more important starting August 1, when the American Board of Medical Specialties (ABMS) will begin reporting on its public website, *www.certificationmatters.org*, whether each physician certified by an ABMS member board is meeting MOC requirements for each certificate held. More information about the new ABMS reporting and Continuous Certification is available in the announcements section of the ABR website at *www.theabr.org*.

MITA Asks CMS to Reconsider PET Tracer Decision

The Medical Imaging & Technology Alliance (MITA) has requested that the Centers for Medicare and Medicaid Services (CMS) reconsider its national non-coverage decision for PET tracers and remove exclusionary language that denies coverage for new PET imaging agents. Such a move would allow local coverage decisions, giving regional Medicare carriers the flexibility to evaluate coverage once the U.S. Food and Drug Administration (FDA) approves the product for medical use and putting PET agents on an equal footing with other imaging technologies and pharmaceuticals.

The formal reconsideration request followed a PET Coverage Workshop convened by MITA to consider new pathways for Medicare coverage of PET radiopharmaceuticals and imaging procedures. Stakeholders from the government, medical professional societies, academia, patient groups and industry gathered to discuss how such pathways can improve access and promote innovation.

IN MEMORIAM:

John F. O'Connor, M.D.

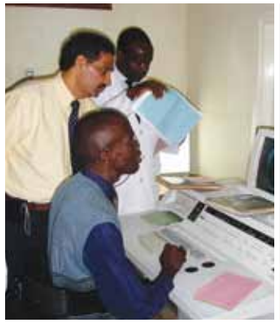
John F. O'Connor, M.D., revered within pediatric radiology as an educator and for his leadership of the Society for Pediatric Radiology (SPR), died March 1, 2012, at the age of 81.

A graduate of the Boston University School of Medicine, Dr. O'Connor trained in pediatrics at Boston City Hospital and completed his radiology residency at the Peter Bent Brigham Hospital. He spent his career at his alma mater as a professor of anatomy, pediatrics, and radiology and served as dean of admissions for 21 years. Dr. O'Connor also served as chief of the Radiology Department at Franciscans Children's Hospital from 1965 to his retirement and as director of pediatric radiology at Boston University Medical Center and Boston City Hospital. He served on the RSNA Audiovisual Services Committee, Bylaws and Resolutions and InfoRAD committees, and represented RSNA on the American Medical Association Coalition of Physicians Against Family Violence. Dr. O'Connor received the SPR gold medal in 1997.

Allison Named ABR Trustee

The American Board of Radiology (ABR) has appointed **Jerry D. Allison, Ph.D.,** a professor of radiology at Georgia Health Sciences Medical College of Georgia, as a new trustee for medical physics.

Dr. Allison is also a diplomate of the ABR in diagnostic radiological physics and medical nuclear physics. He replaces G. Donald Frey, Ph.D., who has been appointed the new associate executive director for medical physics. Dr. Allison is a physics member of the RSNA Refresher Course Committee.



2013 IVP Destinations Selected

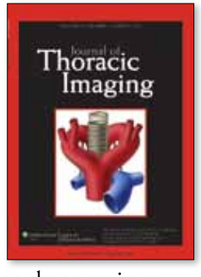
Destinations have been selected for the 2013 RSNA International Visiting Professor (IVP) Program that annually sends teams of North American professors to lecture at national radiology society meetings and meet with radiology residency training programs at selected host institutions in developing nations. Destinations for 2013 are:

- **Tunisia—March 2013**
- **Russia—April 2013**
- **Kenya—May-June 2013**

An IVP team also travels annually to Mexico. Teams of two or three IVPs will be appointed later this year. RSNA—which also provides educational materials to host institutions—has supported the IVP program since 1986. The IVP program is made possible by the support of Agfa HealthCare and Fujifilm Medical Systems.

For more information about the RSNA IVP program, please go to *RSNA.org/International/CIRE/ivpp.cfm*.

Journal of Thoracic Imaging Launches Educational Web Feature



To better promote quality improvement in cardiopulmonary imaging among radiologists and trainees, the *Journal of Thoracic Imaging* recently launched a new Quality Corner section in its online journal at *www.thoracicimaging.com*.

The new Web feature contains links to open-access educational content including: review articles devoted to quality improvement and radiation dose reduction; succinct reviews of American College of Radiology (ACR) Appropriateness Criteria® for cardiopulmonary imaging; a list of suggested Practice Quality Improvement (PQI) projects in cardiopulmonary imaging; a blog series devoted to quality improvement; and links to other open-access resources on quality matters.

Numbers in the News

59

Percent of patients who returned for inferior vena cava (IVC) filter removal when physicians implemented a patient follow-up plan, versus 24 percent who returned without the aid of such a plan. Read "Physician Follow-up Boosts IVC Filter Retrieval Rates," on Page 5.

15

Number of seconds, on average, it took a computerized system to systematically search a patient's electronic health record and display relevant results on a Web-based dashboard. Learn how the Queriable Patient Inference Dossier can be of particular use to radiologists on Page 7.

68

Percent of recently surveyed attending radiation oncologists, medical oncologists, surgical oncologists and palliative care physicians who felt inadequately trained in residency or fellowship to handle bereavement activities with patients and families. Turn to Page 13 to learn how effective communication is becoming an ever more important skill for all physicians.

84

Percent sensitivity achieved by combining standard MR pulmonary angiography, 3D-gradient-echo (GRE) and triggered true fast imaging with steady-state precision (FISP) MR examinations for evaluation of pulmonary embolism (PE), according to a recent study. Read about this and other research published in *Radiology* being promoted to the press on Page 18.

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My Turn

Reflections of an Unlikely Inventor

For many people like me, the notion of inventors always conjures up strangely possessed characters, such as "Doc Brown" in the movie "Back to the Future," able to create a time travel machine in a gadget-filled basement. In the non-fictional world, it is computer geeks like Mark Zuckerberg, whose manipulation of complex computer code has the power to revolutionize life for an entire generation. While these types of inventors do exist, I learned early in my career that most invention is the result of painstaking effort and a focused state of mind, rather than some mystical power bestowed at birth.

To illustrate this notion, I recall an early encounter with Philip Meyers, M.D., one of the founders of the E-Z-EM Corporation. As a young radiologist, Phil had the idea that barium preparations, which were so cumbersome to prepare in radiology departments, might be sold in plastic bags as unit doses to ease the workflow. At a social function he was introduced to Howard Stern, an engineer and recent graduate of MIT. Phil's recognition of an unmet need, matched with someone with the right engineering skills, eventually led to the development of E-Z-EM—now a global company whose many products are in everyday use.

As a young staff member at Penn, I was concentrating on establishing my credibility as an academic radiologist and developing my own research interests when Phil said to me, "Herb, you really need to start thinking about product ideas when you encounter problems or unmet opportunities at work." It was hard to understand what he was talking about. The point became clear when he explained how, at a fried-chicken stand, someone handed him a "Handi Wipe" moist paper towelette—the concept of another successful E-Z-EM product, "Anal Wipes," was born!

Radiologists are constantly involved in evaluating new devices, medical technology and software applications intended to improve patient care. They routinely interface with physicists and engineers and are in a unique position to identify unmet needs and collaborate in developing solutions to clinical problems.

In that first encounter with Phil Meyers, little did I realize that five years later I would be working on a prototype MR imaging system and realize that the problem of poor spatial resolution of the prostate gland would lead to the invention and patenting of an endorectal surface coil to meet that need. Clearly, everyone cannot be a Mark Zuckerberg or a Phil Myers. But perhaps, inspired by these creative thinkers, many of us can find our own inventive talents.

Herbert Y. Kressel, M.D., is editor of *Radiology*. Dr. Kressel is the current Miriam H. Stoneman Professor of Radiology at Harvard Medical School and radiologist-in-chief, emeritus, at Beth Israel Deaconess Medical Center in Boston.

Read the feature, "From Idea to Patent, Radiologist Inventors Share their Insight," on Page 9.

Letter to the Editor

AAPM Statement is Specific

The American Association of Physicists in Medicine appreciates the coverage of its Position Statement on Radiation Risks from Medical Imaging Procedures, in the March 2012 issue of *RSNA News*. However, the coverage did not include the substance of the position statement, which is:

"Risks of medical imaging at effective doses below 50 mSv for single procedures or 100 mSv for multiple procedures over short time periods are too low to be detectable and may be nonexistent. Predictions of hypothetical cancer incidence and deaths in patient populations exposed to such low doses are highly speculative and should be discouraged."

Access the document from the AAPM's position statement page at *www.aapm.org/org/policies/details.asp?id=318&type=PP&current=true*.

William R. Hendee, Ph.D.

Editor's note: *We apologize for the omission. In our efforts to summarize the AAPM's Position Statement about the problems associated with speculating about radiation risk, we failed to provide readers with their specific recommendations. We agree with Dr. Hendee that this information needs to be broadcast in a clear, complete and compelling manner.*

Physician Follow-up Boosts IVC Filter Retrieval Rates

While the use of retrievable inferior vena cava (IVC) filters for preventing pulmonary embolism (PE) is rapidly increasing, the number of filters that are actually "retrieved" is not always keeping pace—often by a wide margin.

Because failing to remove IVC filters can lead to the same potential complications that may result from permanent IVC filters, closing that gap is critical. In 2010, the U.S. Food & Drug Administration (FDA) issued a medical alert noting that retrievable IVC filters could move or break, perhaps causing serious problems for patients, including lower limb deep vein thrombosis. The FDA recommended that implanting physicians and clinicians responsible for the ongoing care of patients with retrievable IVC filters consider removing the filter as soon as protection from PE is no longer needed.

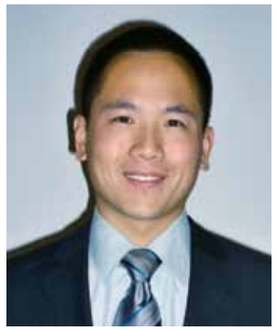
But the filters cannot be removed unless the patient returns for the procedure—which doesn't always happen. "Our research shows that without a follow-up plan, only about one-quarter of patients return to have their filters removed, which is about the national average," said Frank C. Lynch, M.D., an interventional radiologist at Penn State Hershey Medical Center.

Having a follow-up plan in place—even a simple strategy requiring minimal resources—can go a long way in raising retrieval rates. In a study published in the November 2011 issue of the *Journal of Vascular and Interventional Radiology*, Dr. Lynch and colleagues demonstrated that rigorous patient/doctor communication and data collection results in a significantly higher rate of patient return for IVC filter retrieval and a high success rate for patient follow-up in general. "Our research shows that engaging the patient in follow up more than doubles the number of patients who return to have IVC filters removed," Dr. Lynch said.

Although the FDA warning has raised awareness among patients, the retrieval rate remains low for a number of reasons, said Michael G. Chan, M.D., an interventional radiologist at the University of California, San Diego Medical Center.

"Before the procedure, patients are told that this filter could save their life; the potential complications are rare and often glossed over," Dr. Chan said. "The vast majority don't recognize how important retrieval is—either they forget to make an appointment or they don't want to undergo another procedure to remove something they can't see."

Lynch



Chan

Patients Respond to Follow-up Letters

Dr. Lynch and colleagues tracked 1,127 patients implanted with retrievable IVC filters at his institution via a prospectively collected database designed specifically for patient follow up. Researchers studied patients implanted with retrievable IVC filters before (March 2002 to October 2005) and after (October 2005 to May 2010) the follow-up algorithm was put into place.

In October 2005, the interventional radiology service assumed primary responsibility for follow-up of all patients with retrievable IVC filters, including those who received the filters between 2002 and 2005. A single attending physician was assigned this task.

Researchers sent patients a letter reviewing the reasons for implanting the filter and explaining why it should be removed. Failing a patient response, letters were sent at one- and three-month intervals. If patients still did not respond, researchers called them at home—which proved unproductive. Instead, patients were sent a fourth and final letter. Paper letters were filed in the patient's medical record and were later scanned and added to their electronic health records.

Results showed the follow-up plan was highly effective: 59 percent of patients returned for IVC filter removal, versus 24 percent who returned without the aid of a follow-up plan. "Physicians simply have to get involved in follow-up to achieve the highest possible IVC filter retrieval rate," Dr. Lynch said. "Ours—and other research—demonstrate that."

> "Our research shows that engaging the patient in follow up more than doubles the number of patients who return to have IVC filters removed."
>
> **Frank C. Lynch, M.D.**

Radiologists Should Educate Patients on IVC Filters

Radiologists should share the responsibility for IVC filter retrieval, starting with educating their patients before the procedure begins, Drs. Lynch and Chan said.

"It is often as simple as suggesting patients remember to ask their primary care provider about removal at their next appointment; this gives them some responsibility which usually registers strongly, particularly after covering the potential complications," Dr. Chan said.

Many patients aren't aware that IVC filter removal is a simple, outpatient procedure that takes 15 to 20 minutes, barring complications. In fact, even some referring physicians aren't up-to-speed on the evolving technology that was first introduced in 1999, Dr. Lynch said.

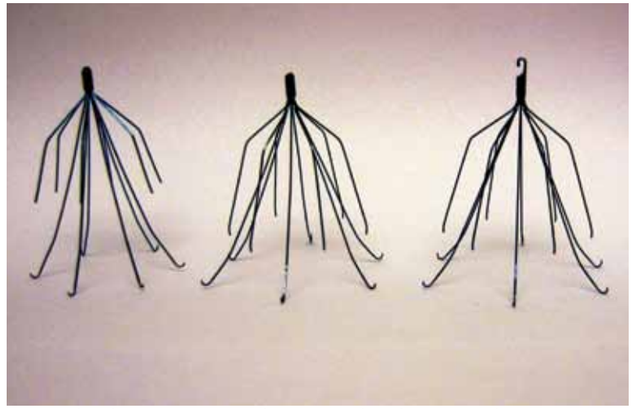
"I've sent letters about IVC filter removal to patients who show their physician and the response has been, 'I had no idea you could take one of those out,'" Dr. Lynch said.

Dr. Chan suggests that interventional radiologists participate in filter registries like the one offered by the Cardiovascular and Interventional Radiology Society of Europe (CIRSE) so that more data can be collected and analyzed. The Society of Interventional Radiology (SIR), which has issued guidelines for use and retrieval of the IVC filters, is also developing a filter registry.

For diagnostic radiologists, a basic understanding of how normal filters appear on various imaging modalities and their potential complications is most important, Dr. Chan said.

"Simply noting that a filter is present on a radiograph or CT is not enough; even a quick examination of the filter could reveal a fractured, missing or protruding strut and prompt possible further workup," he said. "For those less familiar with the different filter types, a quick search online or a file with images of several filters would make a good reference."

Dr. Lynch suggests that patients seeking information on IVC filters visit his website, *Remove MyFilter.com*, which offers information and links to additional resources. "There is so much bad information out there," Dr. Lynch said. "I wanted to give patients an informal way to access information about removable IVC filters." □



Although inferior vena cava (IVC) filter removal is a simple, outpatient procedure, only about one-quarter of patients return to have their filters removed. Retrievable filters, *top, from left:* Recovery Filter, G2 Filter and the G2 Express Filter, all made by Bard Peripheral Vascular.

WEB EXTRAS

To access the Society of Interventional Radiology (SIR) "Guidelines for the Use of Retrievable and Convertible Vena Cava Filters" go to *www.sirweb.org*.

To access an abstract of the study, "A Method for Following Patients with Retrievable Inferior Vena Cava Filters: Results and Lessons Learned from the First 1,100 Patients," by Frank C. Lynch, M.D., go to *www.jvir.org*.

To view a video of Dr. Lynch explaining the IVC filter retrieval process, go to *rsnanews.RSNA.org*.

Patient information on retrievable IVC filters is available on the RSNA-American College of Radiology (ACR) website, *RadiologyInfo.org*.

SIR/SVS IVC FILTER REGISTRY TO ADDRESS FDA QUESTIONS

The Society of Interventional Radiology (SIR) and the Society of Vascular Surgery (SVS) are spearheading a multispecialty taskforce to develop an inferior vena cava (IVC) filter registry that will provide answers to questions about filter use and patient safety.

SIR and SVS are working with the U.S. Food and Drug Administration (FDA) and other government agencies and industry associations to develop protocol for the registry, said Taskforce Co-chair Matthew S. Johnson, M.D. After the protocol is finalized, a pilot portion and a pivotal study will follow, he said.

"Research on IVC filter usage is lacking," Dr. Johnson said. "This registry will address the FDA's questions about IVC filters—not just retrievable, but in general. The work this taskforce is doing—multiple societies, the government, and industry working together to address questions of interest to all of us—represents a paradigm shift."

Optimistically, the registry could be realized by the end 2012, he said.

QPID Search System Quickly Extracts Data in Emergency Departments

Electronic health records (EHRs) have been lauded—and now mandated—for the enhanced patient care, reduced medical errors and cost efficiency they promise. Without a systematic way to search the records, however, physicians can quickly find themselves sifting through haystacks of data trying to find needles of relevant information.

These blind searches can be particularly vexing in emergency departments (EDs), where physicians are often already dealing with complex cases under time pressure. Increased and inappropriate imaging utilization are just a couple of the consequences that can result from the inability to access pertinent information.

Which is why a new ontology-driven EHR search system, developed by a research team at Massachusetts General Hospital (MGH) in Boston, may be of particular benefit to radiologists—not only do radiologists produce a lot of the data that make up EHRs, they rely on that same infomation to optimize future imaging.

Technology Forum

Already implemented at MGH and Brigham and Women's Hospital, Boston, the Queriable Patient Inference Dossier (QPID) search system can extract critical, detailed information from a patient's record in less than a minute, said research team member Arun Krishnaraj, M.D., M.P.H., of the Department of Radiology at MGH, who presented findings on the search system at RSNA 2011.

The upside of EHRs lies in the information they contain—including past imaging tests, laboratory values, and pathology and operative reports—that can help not only to eliminate unnecessary imaging but also improve image interpretation quality by giving the radiologist a greater understanding of the patient, Dr. Krishnaraj said. "Unfortunately, a lot of the information in an EHR is scattered through multiple data repositories," he said. "There are few applications that can cull together the important pieces and present them in a timely and digestible manner."

The Queriable Patient Inference Dossier (QPID) search system can extract critical, detailed information from a patient's record in less than a minute. *Above*: Arun Krishnaraj, M.D., M.P.H., puts QPID to the test at Massachusetts General Hospital.

QPID performs 74 automated natural language searches, developed by the MGH team in conjunction with members of the ED, to mine the EHR for desired information and display it on a Web-based dashboard in bolded text. Values outside the normal range are displayed in red. Average search time is 15 seconds. Results were favorable when compared against manual reviews by two clinicians.

"The system offers a quick overview of a patient's condition based on many different searches," Dr. Krishnaraj said. "It essentially aggregates and indexes all the information in an electronic health record and prepares it for searching."

> "The system offers a quick overview of a patient's condition based on many different searches."
>
> **Arun Krishnaraj, M.D., M.P.H.**

QPID Offers Quick Patient Overview

QPID offers three potential advantages over manual EHR searches, Dr. Krishnaraj said. First is the speed of the search on clinical questions such as, "Is concept X mentioned in this patient's record?" Second is the automation of complex, structured queries based on the clinical service schedule or care unit census. Lastly, QPID can readily export search results into a Web browser or other software application.

Image courtesy of Massachusetts General Hospital

QPID's potential in radiology, according to system developers, is huge. *Above*: the QPID development team at Massachusetts General Hospital, *back row, left to right*: Stefaan Heyvaert, M.A., Neeraj Joshi, M.S., Gaurav Singal, M.D., Abraham Lin, A.B., Sarita Nair, M.S. *Front row, left to right*: Garry Choy, M.D., M.Sc., Arun Krishnaraj, M.D., M.P.H., Michael E. Zalis, M.D., Mitchell A. Harris, Ph.D., and Jim McGaffigan, M.B.A.

For example, information about deep vein thrombosis (DVT), pulmonary embolism, evidence of prior ectopic pregnancy, previous imaging and the presence of an automatic implantable cardiac defibrillator are particularly significant with regard to imaging patients in the ED setting.

Results of searches are categorized into laboratory data and free text queries. For laboratory results, QPID searches demonstrated an average sensitivity of 97 percent and a specificity of 99 percent with a calculated average positive predictive value (PPV) and negative predictive value (NPV) of 99 and 96 percent, respectively. For free text searches of the EHR, QPID had an average sensitivity of 98 percent and specificity of 93 percent, with calculated averages for PPV and NPV of 90 and 98 percent, respectively.

"We've been able to optimize our searches so that our performance statistics are getting really good," Dr. Krishnaraj said.

QPID-based App Tailors Data for Radiology

While the QPID healthcare platform has been implemented in departments throughout hospitals in the Partners HealthCare Network, the system holds particular promise for radiology, said Michael Zalis, M.D., who developed the system with his MGH colleague Mitchell Harris, Ph.D.

"QPID's potential in radiology—which already has a rich IT background—is huge," Dr. Zalis said. "QPID has the capacity to access both structured and unstructured data and everything in between."

QPID searches have been developed to prescreen patients scheduled for MR imaging examinations and alert healthcare providers to possible contraindications, improving safety and limiting workflow disruptions, Dr. Krishnaraj said. "This is particularly effective when patients can't tell you or don't know when they have had something metal—like a pacemaker—implanted or when the referring provider is also not aware of such implants," he said.

Currently, Dr. Krishnaraj is researching the radiology-specific use of QPID to generate patient-specific abstracts tailored to a radiologist's needs, improving the quality and speed of interpretation, Dr. Krishnaraj said.

"Essentially, this QPID-based app filters relevant EHR data for a radiology exam—tailored specifically for each study—and presents that information, along with other helpful tips to optimize the protocal to the radiologist in a dashboard at the time of interpretation," Dr. Krishnaraj said.

For example, a radiologist performing a rectal MR scan could select the rectal app and immediately determine whether the patient has had surgery, check tumor marker levels, see prior pathology and other relevant information, Dr. Krishnaraj said.

"The hope is that this app will not only boost efficiency by pre-filtering relevant information from an EHR, but also improve quality in terms of giving every radiologist the information necessary to pass onto the referring physician," he said. □

WEB EXTRAS

To view videos of Arun Krishnaraj, M.D., M.P.H., and Michael Zalis, M.D., discussing their RSNA 2011 research, "Optimizing the Use of Emergency Department Imaging: Validation of an Ontology-driven EHR Search System to Summarize Essential Past Medical History," go to *rsnanews.RSNA.org*.

Dr. Krishnaraj will present "Validation of an Ontology Based Search Engine for the Electronic Medical Record: Application in the Emergency Department Setting," at the Society for Imaging Informatics in Medicine (SIIM) annual meeting in June. To access an abstract, go to *www.siim.org*.

For more information on the Queriable Patient Inference Dossier (QPID) search system, go to *www.massgeneral.org*.

From Idea to Patent, Radiologist Inventors Share their Insight

From a business perspective, Wilhelm Roentgen's pioneering 1895 discovery of the X-ray is a cautionary tale. While Roentgen's work transformed medicine, he never patented his discovery and died impoverished in Munich in 1923.

Experts say that today's imaging inventors can avoid Roentgen's fate by taking steps to protect their work—not only for financial reasons, but also to speed the introduction of their innovations into the marketplace.

"Some people ask 'Why get a patent?' said Maryellen L. Giger, Ph.D., a professor and vice-chair in the Department of Radiology at the University of Chicago and one of RSNA's representatives on the Commission on Accreditation of Medical Physics Educational Programs (CAMPEP). Dr. Giger holds more than 30 patents. "They'll say, 'If you create new knowledge in science, why not share your work?' The answer is, if you protect your idea with a patent and people recognize its benefit, a company will likely see an economic advantage in licensing and making the product. A patent advances the product into clinical use faster."

A patent is an intellectual property right granted by governments to inventors to prevent others from making, using or selling the invention. The journey from idea to patent is lengthy and expensive, which is why corporate and academic settings typically have intellectual property departments to guide inventors. Dr. Giger has worked with the University of Chicago's Office of Technology and Intellectual Property on a number of patent applications.

The patent itself does not generate revenue; that comes from licensing the invention to a company. For example, Dr. Giger and colleagues Kunio Doi, Ph.D., and Heang-Ping Chan, Ph.D., were inventors of computer-aided detection systems (CADs) for screening mammography and chest radiographs; the patent was subsequently licensed to R2 Technology by the University of Chicago in the 1990s.

"The technology transfer office (UChicagoTech) will look at which companies might want to license an invention and negotiate a licensing agreement with the university and inventors," Dr. Giger said.

In most cases, corporations and academic institutions take ownership of any patent created by an inventor-staff member, who then receives a portion of the licensing royalties. The specifics are typically

Image courtesy of the University of Chicago

Maryellen L. Giger, Ph.D., *(above)* and colleagues Kunio Doi, Ph.D., and Heang-Ping Chan, Ph.D., at the University of Chicago were inventors of computer-aided detection systems (CADs) for screening mammograms and chest radiographs.

addressed in the employment contract. "Funding from a licensing agreement can go to the individual inventors as well as to sections of the university, including the inventor's lab," Dr. Giger said.

While a patent application can be written over multiple days, the submission and review process can go on for years. A faster, less expensive option is a provisional patent, which costs about $125 and allows filing without a formal patent claim, oath or declaration, or any information disclosure statement. It is good for one year and allows the term "patent pending" to be applied to the invention.

> "My recommendation is that you take your idea and develop it as far as you can, then try to license it to a receptive company that is willing to work with you."
>
> **Richard Chesbrough, M.D.**

ON THE COVER

Pioneering physicist William D. Coolidge, Ph.D., invented the X-ray vacuum tube in 1913.

While the journey from idea to patent is lengthy and expensive, rewards can be substantial. The first invention patented by Richard Chesbrough, M.D., *(left)*, the UltraClip® *(right)* for marking breast biopsy sites, now generates annual sales of more than $20 million.

Simple Invention Generates $20 Million Annually

Occasionally, an inventor has success right out of the gate. In 2000, Richard Chesbrough, M.D., a radiologist based in Bingham Farms, Mich., filed to patent one of his first inventions: a clip for marking breast biopsy sites. As the junior member of a private radiology practice in Wisconsin, he was often assigned to perform ultrasound-guided breast biopsies—a task complicated by the lack of a device made specifically to mark small lesions for future localization.

"We used to take a Hilal embolization coil—used for cerebral embolization—and feed it down a spinal needle," Dr. Chesbrough recalled. "It would take 20 minutes or more, often with the coil falling on the floor flying out of my fingers. It got me to thinking, 'Why don't we have a sterile, pre-loaded device with a clip already inside the needle that we can quickly place right into the tissue?'"

Starting with "the proverbial napkin sketch," Dr. Chesbrough filed a provisional patent and began searching for a manufacturer. After identifying companies that sold similar types of products to radiology departments, he wrote them letters and followed up with phone calls. "I pitched the idea to seven or eight companies and eventually found one that was willing to back me," he recalled. "We developed it over the course of a year and then launched it."

The product, the UltraClip®, now boasts annual sales of more than $20 million. Dr. Chesbrough has gone on to patent 11 other inventions, including five products currently on the market.

"My recommendation is that you develop your idea as far as you can, then try to license it to a receptive company that is willing to work with you," he said. "Research the market and get some computer-aided design drawings done. Once you've done that, you can go to the industry, get confidential disclosure agreements signed and pitch the idea to companies, having established intellectual property protection for your innovation."

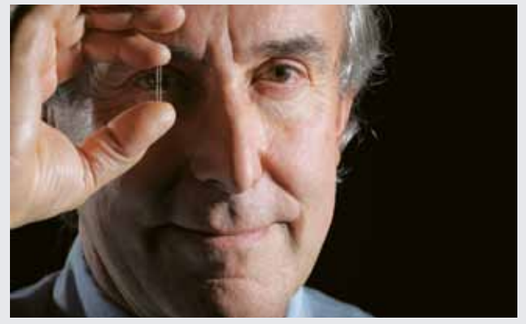
Inventors: Know Your Legal Rights

Confidential disclosure agreements (CDA)—legal contracts that provide protection for inventors who pitch their products to companies—are both essential and cost-effective, according to Dr. Chesbrough.

"If the company steals your idea after signing the CDA, that is a breach of contract and a judge can issue a cease and desist order," he said. "It's much more affordable than a patent infringement lawsuit."

Provisional patents offer the additional benefit of time to test the market for your idea, Dr. Chesbrough said. "If no one's interested, you may not want to spend up to $20,000 to get a formal patent," he said.

Continued on Page 12



RADIOLOGY WELL-REPRESENTED IN INVENTORS HALL OF FAME

Since the National Inventors Hall of Fame was founded in Alexandria, Va., in 1973, inductees have included various notable radiology inventions and their creators:

- 1975—**William D. Coolidge, Ph.D.**, the X-ray vacuum tube
- 1989—**Raymond V. Damadian, M.D.**, the MR imaging scanner
- 1990—**Robert S. Ledley, D.D.S., M.A.**, the automatic computerized transverse axial (ACTA) diagnostic X-ray scanner, the first whole-body CT machine
- 2006—**Julio Palmaz, M.D.**, pictured above with his invention, the balloon-expandable coronary stent

Tech Savvy Teachers are Goal of RSNA Workshop

It's a question even Henry Pancoast might have asked: how do I most effectively engage my students to boost their learning?

The late Dr. Pancoast, appointed the country's first professor of radiology a century ago at the University of Pennsylvania, would likely have been intrigued by the latest answer to that question: audience response systems (ARS). Often referred to as "clickers," the systems allow large groups of people to vote on a topic or answer a question. Each person has a device on which to make selections, which are communicated to a central computer that tabulates the results.

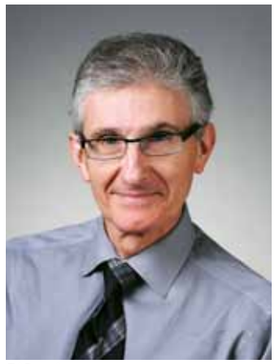
The systems are ubiquitous, found in market research groups and television studio audiences as well as educational settings spanning aviation to zoology. RSNA began using ARS at its annual meeting in 2004 and has expanded use of the technology every year since. However, while it may be fairly easy to get American Idol audience members to vote for their favorite contestants, using ARS to teach can be somewhat more challenging.

"Instructors using ARS need to accept that they'll probably present less information—they won't be able to give the breadth of the topic like they might be used to," said Valerie P. Jackson, M.D., co-presenter of the 2012 workshop. Dr. Jackson is John A. Campbell Professor of Radiology and chair of the Department of Radiology at the Indiana University School of Medicine in Indianapolis.

"But instructors can highlight the most important points, and the audience will be much more likely to retain and use the information," Dr. Jackson continued.

The RSNA Faculty Development Workshop, offered for more than a decade, focuses not only on the nuts and bolts of how ARS work but also, more importantly, on building presentations that maximize audience participation. Workshop participants learn about adult learning principles, case-based teaching and how to write effective multiple-choice questions that consolidate learning and incorporate immediate feedback from learners into the curriculum.

Formerly offered to only RSNA annual meeting instructors, the workshop is now open enrollment. The next workshop will be offered in September in Chicago and registration opens in June. The cost is $150. This live activity has been approved for *AMA PRA Category 1 Credit*™. The workshop also counts toward the new Academy of Radiology Leadership and Management certificate.



DiSantis

Jackson

> "With ARS, you get more information across that sticks—as opposed to the traditional lecture format where you may get a lot of information across, but much of it may not be absorbed or retained at all."
>
> **Valerie P. Jackson, M.D.**

Systems Improve Class Environment, Boost Learning

Studies bear out the effectiveness of ARS-enabled classrooms as an educational medium. Authors of a review of the audience response literature, published in the November 2009 issue of the journal *Computers & Education*, looked at 67 peer-reviewed papers from 2000 to 2007 to determine the benefits and challenges of using ARS. They found that ARS improve the class environment by increasing attendance, attention levels, participation and engagement and also boost learning by encouraging interaction, discussion and contingent teaching. Assessment of learning is also improved with ARS due to the immediate feedback provided, authors found.

"With ARS, you get more information across that sticks—as opposed to the traditional lecture format where you may get a lot of information across, but much of it may not be absorbed or retained at all," said Dr. Jackson.

"There's nothing more challenging for a lecturer than looking out over a sea of blank stares, and knowing they're thinking, 'Come on, get me interested—I dare you,'" added workshop co-presenter David J. DiSantis, M.D., associate residency program director, professor, and quality, safety & compliance medical director in the Department of Radiology at the University of Kentucky. "Using an audience response system is one more 'hook' to draw them in to what you're saying."

However, teaching with ARS poses unique challenges as well. Authors of the ARS literature review found that instructors must learn not only how to operate the technology but also create effective ARS questions, adequately cover course material and respond to instantaneous student feedback.

"Using ARS takes more time—time to come up with good questions as you're developing the presentation, and to incorporate them as you're giving it," Dr. Jackson said.

Noted Dr. DiSantis, "Tossing up an image and asking, 'What's the most likely diagnosis?' is easy, but it doesn't tap into the critical thinking that really challenges your listeners. The time-outs required for the questions definitely are speed bumps when it comes to lecture continuity, so questions should be genuine aids to learning and audience engagement."

Workshop instructors analyze the anatomy of a good question—refined to convey just one critical point, challenging enough that the answer isn't too obvious but not so complicated that participants are confused—and critique questions participants have submitted in advance of the course.

Evolving Educational Approaches Essential

Supplying educational experiences that optimize participant retention has become all the more important as demand for knowledge increases.

At RSNA 2009, in an opening session lecture titled, "Lifelong Learning in the 21st Century and Beyond," Jannette Collins, M.D., M.Ed., noted, "Lifelong learning is now recognized by educators, governing bodies, accreditation organizations, certification boards, employers, third-party payers, and the general public as one of the most important competencies that people must possess … meeting this challenge will require changes in the way teachers teach and learners learn." Dr. Collins, who has authored *RadioGraphics* articles on the benefits of audience response technology in radiology education, is Ben Felson Professor and chair of radiology at the University of Cincinnati.

Dr. Jackson agreed. "In our workshop we teach the mechanics of using an ARS, but we don't stress that nearly as much as we do writing good questions and creating good presentations," she said. "The course is much more about how to educate."

She added that workshop participants span the spectrum from junior faculty to seasoned, international lecturers. "I find it fascinating that people I consider the best speakers are always looking for ways to do it better," she said. □

For more information about the RSNA Faculty Development Workshop, go to *RSNA.org/In-Person_Education.aspx*.

From Idea to Patent, Radiologist Inventors Share their Insight

Continued from Page 10

When pitching an invention, Dr. Chesbrough recommends targeting smaller and midsize companies (those with fewer than 100 employees). "Larger companies tend to grow by buying smaller companies," he said. "The smaller and midsize companies are more innovative. Write to them and ask if they are willing to look at new ideas."

Rewards can be substantial. Dr. Chesbrough, who earns a seven-figure income from his various inventions, says physician inventors can generally expect royalties in the range of 5 to 7 percent of a company's gross revenues from sales of their inventions.

"Radiologists on the front lines are often in the best position to know what tools are needed," Dr. Chesbrough said. "That's how a new invention begins. Talk to your colleagues about the idea and gauge their response. If they're receptive, then you know you may be onto something. File a provisional patent, get the nondisclosure agreements signed and get out there and sell it." □

WEB EXTRAS

For more information on patents—including a searchable database—from the U.S. Patent and Trademark Office, go to *www.uspto.gov/patents*

For more information on the National Inventors Hall of Fame, go to *www.invent.org*

Communication Skills Can Make or Break a Patient-Physician Relationship

Many years ago, a relatively new breast imager preparing to give a patient the results of an abnormal mammogram walked into the exam room, and without introducing himself, blurted out, "Well, you've got cancer."

The woman immediately broke down in tears and ran out of the room.

As this case demonstrates, how a doctor communicates to a patient can make all the difference in setting the tone for how a patient will react and begin to grasp the impact.

"A doctor's attitude or behavior can absolutely make or break their relationship with a patient," said Michael Linver, M.D., director of mammography at X-Ray Associates of New Mexico in Albuquerque, who provided the true example of a former colleague from his own practice. Dr. Linver presented "Talking with Patients: Ways to Gain Their Trust" at RSNA 2011. "Sensitivity and empathy should always be part of any radiologist/patient interchange."

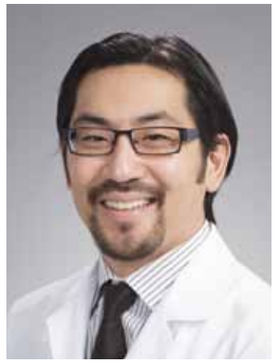
As patients continue to take a more active role in their own healthcare, all physicians—particularly radiologists—need to develop the communication skills necessary to create satisfying patient/physician relationships. No longer isolated in the back room interpreting exams, radiologists are increasingly being asked to take on a more direct role in patient care. Efective patient communications skills are not only desirable, they're necessary, experts say.

"With the exception of interventional radiology, there has traditionally been little opportunity for real one-on-one interaction between patient and radiologist," Dr. Linver said. "That changed dramatically in the past 10 years with the advent of the breast imaging specialist."

Because many radiologists lack communication training and are accustomed to working behind the scenes, some are likely to feel ill-equipped to step into the role of "communicator."

Fortunately, radiology organizations including RSNA are developing and fortifying efforts to improve patient/physician communications that could go a long way toward making imaging more valuable in the eyes of the public (See sidebar).

Linver



Kusano

Treat Patients like Family

When engaging with patients, radiologists need to remember that names and images belong to an actual person. "I treat every patient as a member of my own family—it is the way I would want to be treated if I were a patient," Dr. Linver said.

There should always be an attempt to go over the report with the patient by phone or in person, and, if in person, show actual images to the patient—which creates an even stronger bond. Other simple actions include providing a letter to patients to inform them when their results will be ready, stepping into the exam room to greet a patient before a radiologic procedure and following up with a patient after recommending additional studies.

Radiologists should also strive to obtain better histories directly from patients, Dr. Linver said. "This allows for a more accurate interpretation by the radiologist and shows the patient that the radiologist really cares about the patient as a person, not just as a collection of images."

Always use a reassuring voice and be very kind when patients ask questions. "The doctor should explain the situation in a language the patient can understand and in a way that is as reassuring as is possible, always trying to find something to be positive about," Dr. Linver said.

Even a physician who is informing a patient she has cancer should not leave the person without hope. "She will never survive the entire breast cancer treatment process without that," he said.

> "Talking with patients is one of the most important and undervalued services we deliver in healthcare."
>
> **Aaron S. Kusano, M.D., S.M.**

Radiologists are increasingly being asked to take on a more direct role in patient care, making effective patient communications skills not only desirable but necessary. Along with basic methods such as using a kind, reassuring voice and being a good listener, radiologists can improve communication skills through patient-centered initiatives offered by organizations including RSNA.

Radiation Oncologists Lack Communication Support

Results of one new study underscore the lack of specialized training in communication skills among physicians who likely need it the most. Two-thirds of cancer care physicians do not feel they received adequate training in this area during their residency or fellowship, according to research presented at the 2011 American Society for Radiation Oncology (ASTRO) annual meeting.

"Talking with patients is one of the most important and undervalued services we deliver in healthcare," said lead author Aaron S. Kusano, M.D., S.M., a resident in the Department of Radiation Oncology at the University of Washington School of Medicine, Seattle. "If done well, a critical bond with the patient can be established, creating a level of trust and comfort." The urgency of this issue was echoed by senior author, Charles R. Thomas, Jr., M.D., a professor and chair of the Department of Radiation Oncology at the Knight Cancer Institute of the Oregon Health and Science University, Portland.

The study, an anonymous online survey, examined the frequency and scope of bereavement practices among cancer care and palliative care physicians in the northwestern U.S. It was completed by 162 attending radiation oncologists, medical oncologists, surgical oncologists and palliative care physicians directly involved in patient care in fall 2010.

Results showed that 70 percent of cancer care physicians were routinely engaged in at least one bereavement activity, with sending a condolence letter by far the most common form of communication. Other physician-initiated activities included calling families or attending a funeral service following a patient's death.

Yet 68 percent of respondents felt inadequately trained in residency or fellowship to address bereavement activities; physicians were less likely to perform follow up with the bereaved if they lacked bereavement support services or felt uncomfortable about what to say. "Every physician will encounter death and when we choose to reach out to a family, our training should equip us to feel comfortable in doing so," said Dr. Kusano.

Several factors made an individual more likely to perform active follow up, including being a medical oncologist (versus a radiation oncologist or palliative care physician), having access to a palliative care program and feeling responsible for writing a condolence letter. The most common barriers to bereavement follow up were lack of time and uncertainty as to which family member to contact.

"I think there is an important message here to all physicians," Dr. Kusano said. "Through anecdotes and small studies, we know that many families/survivors appreciate follow up by the physician, but what physicians actually do needs much more study." □

RSNA INITIATIVES PUT PATIENTS FIRST

Long at the forefront of patient-centered radiology, RSNA is ramping up efforts in 2012 on a number of fronts.

Themed "Patients First," RSNA 2012 will offer programming focusing on patient-centered care, including communication with patients and providing dose-optimized imaging. RSNA will again offer the refresher courses, "Vignette-based Disclosure of Medical Error in Radiology," "Patient-centered Radiology: It's Good Business" and "What the Referring Physician Needs to Know."

The RSNA Board of Directors has also appointed a Patient-Centered Radiology Steering Committee to guide future patient-centered initiatives.

In addition, the RSNA-American College of Radiology (ACR) website *Radiologyinfo.org*—the radiology information resource for patients—is regularly updated with new information and videos educating patients on radiology procedures.

Stay updated on RSNA 2012 programming at *RSNA2012.RSNA.org*.

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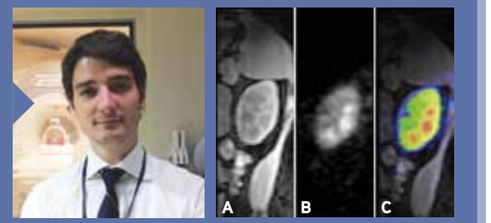
Roberta Morgado & Henrique B. Zuppani, M.D.

Your Donations in Action

With an RSNA R&E Foundation Research Fellow Grant, **Alessandro Furlan, M.D.**, is investigating sodium concentration and distribution in kidney transplant patients using sodium MR imaging as a new noninvasive biomarker for renal allograft functionality.



Proton (^{1}H) -3D VIBE- (A), sodium (^{23}Na) (B), and fusion (C) sagittal images of left native kidney in 32-year old male normal volunteer.

GRANT RECIPIENT ALL-STAR

Scott B. Reeder, M.D., Ph.D.

Then ... 2006 Agfa HealthCare/RSNA Research Scholar Grant recipient for his project:
Quantification of Hepatic Steatosis with Magnetic Resonance Imaging

Now ... Section Chief of Cardiovascular Imaging, and Director of the University of Wisconsin (UW) clinical MRI fellowship. Dr. Reeder is also the Director of the UW Liver Imaging Research Program, an active NIH-funded group that performs research in technical development and translation of new imaging methods to assess liver disease.

CAREER HIGHLIGHTS

Grant Funding:
- $4.9 million received as principal investigator
- $6.9 million received as co-investigator

Patents:
- 20 - Author/Co-Author of patents in Magnetic Resonance Imaging

Publications:
- 3 books, 111 papers, 317 abstracts

Presentations:
- 93 (National/International)

"The R&E grant support came at a crucial, early stage of my career, providing me the time to lay the foundation of my research program and to perform early studies necessary to obtain extramural support from the NIH."

Journal Highlights

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

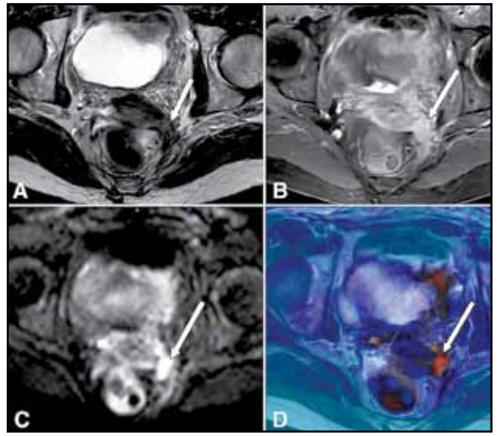
Genitourinary Applications of Diffusion-weighted MR Imaging in the Pelvis

Diffusion-weighted (DW) imaging is emerging as a promising technique complementary to the standard protocol in a broad range of clinical applications in the female and male pelvis, provided that standardization of technical parameters is obtained.

In a state-of-the-art article in the May issue of *Radiology* (*RSNA.org/Radiology*), Harriet C. Thoeny, M.D., of the University of Bern, Switzerland, and colleagues review the current state of clinical applications of DW imaging in the female and male pelvis to answer clinically important, but unresolved questions that remain with conventional MR imaging. Specifically, the authors discuss:

- Technical aspects of DW imaging
- Applications of DW imaging in the female and male pelvis
- DW imaging in the urinary bladder
- Imaging of pelvic lymph nodes

"Genitourinary applications of DW imaging in the pelvis improve staging of advanced endometrial and cervical cancer, allow detection of prostate cancer in the peripheral zone, might allow differentiation of superficial from invasive bladder cancer, and might even be helpful in lymph node staging provided that state-of-the-art and standardized techniques are applied and expertise of the radiologist is improving continuously," the authors write.



MR images at 3.0 T in 68-year-old woman with pelvic recurrence of vaginal cancer in region of radiation fibrosis. A. T2-weighted (3710/108) image shows intermediate SI *(arrow)*. B. Contrast-enhanced fat-saturated T1-weighted (700/16) image shows moderate enhancement in bandlike fibrosis *(arrow)* between the vaginal stump and left pelvic sidewall. C. Complementary DW image (4700/61) at b of 800 sec/mm2 shows high SI *(arrow)*. D. Fused T2-weighted/DW image *(arrow)* aids in delineation of recurrence, which was confirmed at PET/CT.

(*Radiology* 2012;263;2:326-342) ©RSNA, 2012 All rights reserved. Printed with permission.

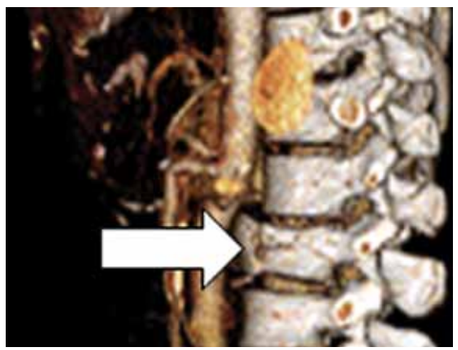
Blunt Polytrauma: Evaluation with 64-section Whole-Body CT Angiography

Whole-body CT is increasingly recognized as the emerging standard for providing rapid and accurate diagnoses to trauma victims with multiple, severe injuries, posing new challenges to radiologists in providing efficient and timely interpretations.

In the May-June issue of *RadioGraphics* (*RSNA.org/RadioGraphics*) David Dreizin, M.D., and Felipe Munera, M.D., of the University of Miami Health System, discuss the use of 64-section whole-body CT angiography (CTA) in evaluating patients with blunt polytrauma. Specifically, the authors discuss:

- Potential indications for whole-body CTA
- The importance of the use of trauma scoring
- The value of whole-body CTA in depicting important, not-to-miss injuries at each anatomic level
- The benefit of reviewing multiplanar reformation and 3D images for timely and accurate interpretation
- Potential pitfalls that should be avoided, as well as ongoing controversies and future trends.

"Utilization of 64-section whole-body CT angiography in the trauma setting is expected to continue to become more widespread in the foreseeable future, underscoring the need for radiologists to develop strategies for efficient and accurate interpretation, be mindful of the rational use of whole-body CT with consideration of radiation risk, and be knowledgeable of injuries that should be promptly communicated to surgical or interventional colleagues," the authors write.



Sagittal view from a volume-rendered continuous-pass whole-body CT angiographic study allows selective visualization of bone and vascular structures and identification of a burst fracture of the L2 vertebra *(arrow)*.

(*Radiographics* 2012; In Press) ©RSNA, 2012 All rights reserved. Printed with permission.

This article meets the criteria for *AMA PRA Category 1 Credit™*. CME is available in print and online.

Radiology in Public Focus

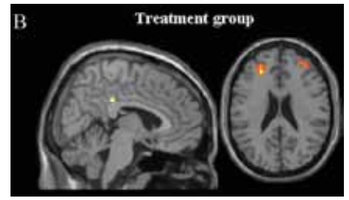
Press releases were sent to the medical news media for the following articles appearing in recent issues of *Radiology*.

Multiple Sclerosis: Effects of Cognitive Rehabilitation on Structural and Functional MR Imaging Measures—An Explorative Study

Rehabilitation of attention and information processing and executive functions in relapsing-remitting multiple sclerosis (MS) may be effected through enhanced recruitment of brain networks subserving the trained functions, according to new research.

In the study, Massimo Filippi, M.D., of San Raffaele Vita-Salute University in Milan, Italy, assigned 20 patients with relapsing-remitting MS and cognitive deficits at baseline to undergo treatment that entailed computer-assisted cognitive rehabilitation of attention and information processing and executive functions, or to serve as control subjects without cognitive rehabilitation. All patients underwent a standardized neuropsychologic assessment and MR imaging at baseline and after 12 weeks.

As compared with their performance at baseline, the patients in the treatment group improved at tests of attention and information processing and executive functions, researchers discovered. "Our results show that functional MR imaging techniques might be suitable for monitoring the effect of therapeutic interventions in patients with MS," they write.



Statistical parametric mapping results (color-coded for t values) overlaid on high-resolution T1-weighted MR images show changes in functional MR imaging activations during the Stroop interference condition in treatment group (P < .05, paired t test, family-wise corrected for multiple comparisons).

(*Radiology* 2012;262;3:932–940) ©RSNA, 2012. All rights reserved. Printed with permission.

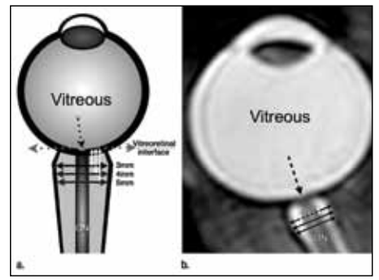
Orbital and Intracranial Effects of Microgravity: Findings at 3-T MR Imaging

Exposure to microgravity can result in a spectrum of intraorbital and intracranial findings similar to those in idiopathic intracranial hypertension, new research shows.

In a retrospective study, Larry A. Kramer, M.D., of the University of Texas Health Science Center, Houston, and colleagues used quantitative and qualitative MR to identify intraorbital and intracranial abnormalities in 27 astronauts previously exposed to microgravity.

Thin-section three-dimensional T2-weighted orbital images depicted central T2 hyperintensity of the optic nerve and structural detail of the optic papilla not well established in the literature, according to results.

"Physiologic changes occurring during exposure to microgravity may help elucidate mechanisms responsible for terrestrial idiopathic intracranial hypertension," the authors write.



The vitreoretinal interface (VRI) *(dashed double-sided arrow)* represents a plane perpendicular to the optic nerve (ON) at the border between the optic nerve papilla *(dashed arrow)* and vitreous. The optic nerve sheath diameter (ONSD) is measured from inner margin to inner margin *(solid black double-sided arrows)* 3, 4 and 5 mm posterior to the VRI *(white double-sided arrows)*.

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MR Imaging of Pulmonary Embolism: Diagnostic Accuracy of Contrast-enhanced 3D MR Pulmonary Angiography, Contrast-enhanced Low-Flip Angle 3D GRE, and Nonenhanced Free-Induction FISP Sequences

There are complementary benefits to combining standard MR pulmonary angiography (PA), 3D-gradient-echo (GRE) and triggered true fast imaging with steady-state precision (FISP) MR examinations for evaluation of pulmonary embolism (PE), according to new research.

In a retrospective study of the three techniques on 22 patients with a CT angiography (CTA) diagnosis of PE, Bobby Kalb, M.D., of Emory University School of Medicine, Atlanta, and colleagues discovered sensitivities for PE detection were 55 percent for MRPA, 67 percent for triggered true FISP and 73 percent for 3D-GRE MR imaging. Combining all three MR sequences improved overall sensitivity to 84 percent, results showed.

"This study shows potential gains in PE detection by using nonstandard vascular MR imaging methods designed to bypass the need for accurately timed arterial phase contrast enhancement, breath holding, or obviate the need for contrast material administration altogether," the authors write.

Pulmonary embolus *(arrow)* at bifurcation of the right pulmonary artery in a 67-year-old woman. CT pulmonary angiogram.

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Radiology in Public Focus

Lung Cancers Diagnosed at Annual CT Screening: Volume Doubling Times

Volume doubling times (VDTs) of lung cancers detected in annual rounds of CT screening are not significantly different from those detected in the absence of screening, new research shows.

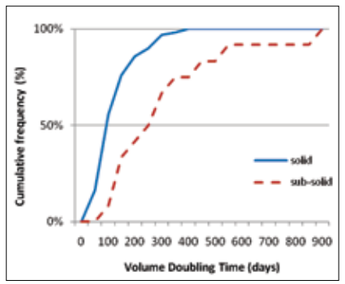
Addressing the concern that lung cancers diagnosed through CT screening may not be as aggressive as those detected in clinical practice, Claudia I. Henschke, Ph.D., M.D., of Mount Sinai School of Medicine, New York City, and colleagues reviewed distribution of VDTs of lung cancers diagnosed in repeat annual rounds of CT screening in the International Early Lung Cancer Action Program (I-ELCAP), first and foremost with respect to rates of tumor growth, but also in terms of cell types.

Researchers reviewed I-ELCAP results for 1993 to 2009 of men and women at risk for lung cancer who underwent annual repeat rounds of CT screening. Researchers identified 111 instances of first primary lung cancer diagnosed either through screening or between rounds after a negative result of the prior screening seven to 18 months earlier. Of the 111 cancers identified, 88 were clinical Stage I. Investigators then analyzed volume doubling time and cell-type distribution.

Results showed that the median volume doubling time was 98 days. Ninety-nine of the 111 cancers manifested as solid nodules, while only 12 of the cancers manifested as sub-solid nodules. Lung cancers manifesting as sub-solid nodules had significantly longer VDTs than those manifesting as solid nodules.

VDTs for lung cancers diagnosed in clinical practice in the absence of screening have been reported to range from 20 to 360 days. A recent study, based on a systematic medical literature review, reported a mean volume doubling time of 135 days for non-small-cell lung cancers diagnosed in the absence of screening.

"Because the distribution of VDTs of lung cancers diagnosed in annual screening rounds is significantly different for cancers manifesting as solid nodules than for those manifesting as sub-solid nodules, work-up and treatment may become more tailored according to nodule consistency."



Graph shows cumulative frequency distribution of the calculated volume doubling time (VDT), separately for cancers manifesting as solid (*n* = 99) and those manifesting as subsolid (*n* = 12) nodules.

Media Coverage of RSNA

From mid-January to mid-February, media outlets carried 2,047 RSNA-related news stories. These stories reached an estimated 8 million people.

Print coverage included *The Washington Post*, *Philadelphia Inquirer*, *Kansas City Star*, *Hartford Courant* and *The Honolulu Star-Advertiser*.

Broadcast coverage included WNYW-TV (New York), WOR-AM (New York), KCAL-TV (Los Angeles), KNBC-TV (Los Angeles), WGN-TV (Chicago), WAGA-TV (Atlanta), WFAA-TV (Dallas), KDFW-TV (Dallas), KTVT-TV (Dallas), KDVR-TV (Denver), KUSA-TV (Denver), KPIX-TV (San Francisco) and WTVF-TV (Nashville).

Online coverage included *The New York Times*, *Boston Globe*, *Arizona Republic*, *Houston Chronicle*, *The Huffington Post*, Yahoo! Finance, CNN, Fox News, *Daily News* (London) and Science Daily.

MAY PUBLIC INFORMATION ACTIVITIES FOCUS ON STROKE

In recognition of American Stroke Month in May, RSNA is distributing public service announcements (PSAs) focusing on:

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

In addition to the PSAs, RSNA is also distributing the "60-Second Checkup" audio program to radio stations. This month, the program focuses on the use of MR imaging in stroke diagnosis.

RadiologyInfo.org Posts New "Your Radiologist Explains" Videos

Videos on CT During Pregnancy, MR Angiography and MR Imaging are now available on *RadiologyInfo.org* as part of the "Your Radiologist Explains" series providing visitors with a unique format for learning about radiology procedures.

New videos will continue to be added to *RadiologyInfo.org*. All presentations were created by members of the RSNA-American College of Radiology (ACR) Public Information Website Committee. The videos, featuring PowerPoint presentations with images and narration, help explain various radiology tests and treatments to patients.

To access the videos, go to *RadiologyInfo.org/vids*.

The Value of Membership

RSNA Liver Collection Refresher Course Now On Sale

For a limited time, RSNA is offering discount pricing on selected refresher courses from past annual meetings. One of the most popular collections this year, the Liver Collection, is now available at a 25 percent discount until October 10, 2012. The discount price is $90 for member/$130 for nonmembers.

The two CDs included in the collection, "Diffuse Liver Disease: Deposition Disorders and Vascular Abnormalities" and "Imaging of Focal Liver Lesion: Techniques for CT and MR Imaging," review major lesions and deposition diseases of the liver and apply the latest imaging techniques to their management.

A CME test included with each course provides physicians the chance to earn CME credit by filling out the test and sending it to RSNA. The Liver Collection offers *3.00 AMA PRA Category 1 Credits™*. To purchase the collection at the new discounted rate, go to the RSNA Education Center catalog at *RSNA.org/Education_Offerings.aspx*.

New Physics Task Force Co-Chairs

The RSNA Education Center welcomes Robert G. Dixon, M.D., and Eric L. Gingold, Ph.D., as leaders of the RSNA/American Association of Physicists in Medicine (AAPM) Physics Modules Task Force.

The online modules are designed to educate radiologists and residents about important concepts in physics as described by AAPM physics curriculum. Each module has been developed by a team including at least one physicist and one radiologist and has been peer reviewed for content and quality. As leaders of the task force, Drs. Dixon and Gingold provide essential guidance and experience for future module developments.

Free to RSNA members, the Physics Modules are available at *RSNA.org/RSNA/AAPM_Online_Physics_Modules_.aspx*.

Point of Care CME: A Member-Only Benefit

Earning CME credit online has never been easier with RSNA's Point of Care (PoC) CME, RSNA's online tracking mechanism accessible through myRSNA.®

PoC CME not only assists with everyday practice concerns, but also allows physicians to obtain CME credit for the articles they read. Members begin by using the mySearch function on myRSNA to research a clinical question, then select the most relevant literature from resources identified on the PoC CME tab. Clicking the PoC link and answering every question after reading the article(s) allows the user to obtain CME credit. PoC learning conforms to American Medical Association guidelines.

Each article claimed for PoC CME credit is worth 0.5 *AMA PRA Category 1 Credit™*.

Education and Funding Opportunities

RSNA Clinical Trials Methodology Workshop

January 12-18, 2013
Scottsdale/Ariz.
Applications due
June 4

Over the course of this 6½-day workshop, each trainee will be expected to develop a protocol for a clinical study, ready to include in an application for external funding. Participants will learn how to develop protocols for the clinical evaluation of imaging modalities. A dynamic and experienced faculty will cover topics including:

- Principles of clinical study design
- Statistical methods for imaging studies
- Design and conduct of multi-institutional studies
- Sponsorship and economics of imaging trials
- Regulatory processes

Applicants will undergo a competitive selection process for course entrance. Once admitted, trainees will participate in advance preparation, didactic sessions, one-on-one mentoring, small group discussions, self-study and individual protocol development. Familiarity with basic concepts and techniques of statistics and study design is required of all applicants.

Applications are available at *clinicaltrials.RSNA.org*. For for information, contact Fiona Miller at 1-630-590-7741 or *fmiller@rsna.org*.

RSNA Derek Harwood-Nash International Fellowship

Applications due
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 for this program is available at *RSNA.org/Derek_Harwood-Nash_International_Fellowship.aspx*. For more information, contact Fiona Miller at *fmiller@rsna.org* or 1-630-590-7741.

Medical Meetings

May-June 2012

MAY 28-JUNE 1
The Russian National Congress of Radiologists, Radiology 2012, Crocus Expo International Exhibition Centre, Moscow
• *www.radiology-congress.ru*

MAY 28- JUNE 1
European Society of Pediatric Radiology (ESPR), 49th Annual Meeting and 35th Postgraduate Course, Athens, Greece
• *www.ESPR2012.org*

MAY 31- JUNE 2
Swiss Society of Radiology (SSR), Annual Meeting, Congress House Zurich, Switzerland
• *www.sgr-ssr.ch*

JUNE 2-4
Society for Brain Mapping and Therapeutics (SBMT), 9th Annual World Congress of SBMT on Brain Spinal Cord Mapping and Image Guided Therapy, Metro Toronto Convention Center, Canada
• *www.ibmisps.org*

JUNE 7-10
Society for Imaging Informatics in Medicine (SIIM), Annual Meeting, Orlando World Center Marriott, Fla. • www.siim2012.org

JUNE 7-10
International Society of Radiographers and Radiological Technologists (ISRRT), World Congress, Sheraton Centre Hotel, Toronto, Canada
• *www.2012isrrt.org*

JUNE 9-13
Society of Nuclear Medicine (SNM), 2012 Annual Meeting, Miami Beach Convention Center
• www.snm.org

JUNE 12-15
European Society of Gastrointestinal and Abdominal Radiology (ESGAR), 23rd Annual Meeting, Edinburgh International Conference Centre, Scotland
• *www.esgar.org*

JUNE 14-17
World Congress on Interventional Oncology (WCIO), Sheraton Chicago Hotel & Towers, Ill.
• *www.wcio2012.org.*

JUNE 16-19
International Diagnostic Course Davos (IDKD), 2nd IDKD Intensive Course in Hong Kong, Diseases of the Abdomen and Pelvis, Hong Kong Convention and Exhibition Centre
• *www.idkd.org*

RSNA Advanced Course in Grant Writing

Applications due
July 31

Applications are now being accepted for this course designed to assist participants—generally junior faculty members in radiology, radiation oncology or nuclear medicine programs—prepare and submit a National Institutes of Health (NIH), National Sciences Foundation (NSF) or equivalent grant application by the October 2013 deadline. The course, to be held at RSNA Headquarters in Oak Brook, Ill., will consist of four two-day sessions: October 12-13 2012; January 25-26, 2013; March 15-16, 2013; and May 3-4, 2013.

For more information and an application, go to *RSNA.org/AGW* or contact Fiona Miller at 1-630-590-7741 or *fmiller@rsna.org*.

RSNA/AUR/ARRS Introduction to Academic Radiology Program

Applications due
July 15

Sponsored by RSNA, the American Roentgen Ray Society (ARRS) and Association of University Radiologists (AUR), the Introduction to Academic Radiology program:

- Exposes second-year residents to academic radiology
- Demonstrates the importance of research in diagnostic radiology
- Illustrates the excitement of research careers
- Introduces residents to successful clinical radiology researchers

Successful applicants will be assigned to either a seminar held during the RSNA Scientific Assembly in Chicago, November 25-29, 2012 or the ARRS Scientific Meeting in Washington, DC, April 14-19, 2013.

More information on these programs is available on the Science & Education page on *RSNA.org*. Questions can be directed to Fiona Miller at 1-630-590-7741 or *fmiller@rsna.org*.

Residents & Fellows Corner

Diagnostic Radiology Part of Rollout of New Residency Accreditation System

An outcomes-based evaluation system is the centerpiece of a new medical residency program accreditation process announced recently by the Accreditation Council for Graduate Medical Education (ACGME). Diagnostic radiology joins emergency medicine, internal medicine, neurological surgery, orthopedic surgery, pediatrics and urological surgery as specialties initially affected by the changes.

A summary of ACGME's "next accreditation system" for graduate medical education appears in the February 22, 2012, online edition of the *New England Journal of Medicine*. The system, to be fully implemented by 2014, requires that each accredited medical residency program demonstrate that its residents have the core competencies and clinical skills to deliver quality patient care and respond to rapid developments in healthcare delivery.

The next accreditation system aligns with recommendations made by the Institute of Medicine and the Medicare Payment Advisory Commission. Under the system:

- Medical residents and fellows must demonstrate competency in six core areas—patient care, medical knowledge, practice-based learning and improvement, systems-based practice, professionalism and interpersonal skills and communication.
- Teaching institutions are required to develop and publish the specific learning outcomes residents must demonstrate as they progress through training.
- Institutions must submit reports to ACGME every six months documenting each resident's accomplishments in meeting benchmarks for physician competence.
- ACGME will update the accreditation status of each program yearly based on trends in key performance parameters.

The system will be phased in over next two years:

- 2012—Training for the Review Committees that will redesign the accreditation programs for the first seven specialties including diagnostic radiology.
- July 2013—The first seven specialties implement the next accreditation system and the ACGME begins training the Review Committees for the remaining specialties.
- July 2014—Next accreditation system is implemented by all specialties.

The ACGME expects the new system will reduce the burden on teaching institutions while enhancing accountability to the public for the effectiveness of graduate medical education. More information about the next accreditation system is available at *www.acgme-nas.org*.

Annual Meeting Watch

News about RSNA 2012

RSNA 2012

Advance Registration and Housing Open May 9

RSNA 2012 advance registration and housing open May 9 for RSNA and AAPM members. Non-member registration and housing open June 6. Advance Registration and Housing information is available at *RSNA2012.RSNA.org*.

RSNA CONTINUES ALONG "GREEN" PATH

RSNA's recycling and conservation efforts at the 2011 annual meeting yielded impressive results. Green initiatives in place at McCormick Place led to an environmental waste diversion rate of 64 percent, up 1 percent from 2010. RSNA diverted more than 244 tons of materials from the landfill. Conservation initiatives saved 3,803 trees, 85,015 gallons of oil, 917,719 kilowatts of electricity, 733 yards of landfill space and 1,566, 073 gallons of water.

In addition, the food service company SAVOR donated 2,100 pounds of food to a Chicago-area mission.

International Visitors

International Letters Available—Act Now for Visa

Personalized letters of invitation to RSNA 2012 are available for request during online registration. In addition, the International Visitors section of *RSNA2012.RSNA.org* 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.

Hotel Deposits Required

A $300 deposit is required to secure your hotel reservation. Reservations may be secured with a major credit card at the time of booking. **The credit card must be valid through December 2012 and will be charged by the hotel approximately two weeks before the annual meeting.** Registrants can also send a check, money order or wire transfer (payable to RSNA) for the hotel deposit. (Guests are responsible for all wire transfer fees.)

Course Enrollment Begins July 11

Course enrollment information will be mailed in late June to all members and 2012 meeting registrants and will also be available online at *RSNA2012.RSNA.org*. Those registering for RSNA 2012 prior to June 15 who wish to view course enrollment information online only can "opt out" of receiving the copy by mail.

RSNA 2012 Registration

How to Register

There are four ways to register for RSNA 2012:

1 INTERNET—Fastest way to register!
Go to *RSNA.org/register*

2 FAX (24 hours)
1-888-772-1888
1-301-694-5124

3 TELEPHONE
(Mon.-Fri. 8 a.m. – 5 p.m. CT)
1-800-650-7018
1-847-996-5876

4 MAIL
Experient/RSNA 2012
P.O Box 4088
Frederick, MD 21705 USA

Registration Fees

BY NOV. 2	AFTER NOV. 2	
$ 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
165	265	Non-Member Resident/Trainee
165	265	Radiology Support Personnel
750	850	Non-Member Radiologist, Physicist or Physician
750	850	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

Important Dates for RSNA 2012

May 9	Member registration and housing open
June 6	Non-member registration and housing open
July 11	Course enrollment opens
Oct 19	Deadline for international badge mailing
Nov 2	Deadline for housing and discounted registration
Nov 21	Deadline for guaranteed seating to all ticketed courses
Nov. 25 – 30	RSNA 98th Scientific Assembly & Annual Meeting

THE NEW
RSNA.org

Informatics Tools Keep You Ahead of the Curve

Navigating the rapidly changing healthcare landscape is easier than ever with the newly redesigned RSNA Informatics Page on the all-new *RSNA.org*.

Along with a dynamic collection of tools designed to keep you at the forefront of technology while achieving meaningful use goals, the page offers easy-to-use online demos, software and templates to maximize your informatics experience.

Highlights of the redesigned page include:

- **Things to Know:** From an informatics tools flowchart to links to *RSNA News* stories detailing real-world MIRC experiences, this section spotlights need-to-know information.
- **Solutions for Quality and Efficiency:** Icons link users to technology-based tools essential to enhancing workflow and increasing productivity. Among them:

  IHE: Get information on the Integrating the Healthcare Enterprise® (IHE) initiative, including how it's used and how to adopt the solution for your institution. IHE links at the bottom of the page include an IHE Discussion Board.

  Image Share: Try an online demo of the secure network that lets patients take control of their medical imaging records and electronically share them with physicians.

  Meaningful Use: Explore RSNA's performance solutions and informatics initiatives to help fulfill meaningful use requirements.

Clinical Trials Processor: Access free software that enables researchers to exchange, index and retrieve images and documents for imaging clinical trials.

RadLex: Stay up-to-date on the comprehensive lexicon for standardized indexing and retrieval of radiology information resources. Peruse the RSNA term browser, download the RadLex playbook and access online RadLex resources at the bottom of the page.

COMING NEXT MONTH

More universities are offering fourth-year residents a "focused year" program, allowing them to focus their education on one or two disciplines for up to six months. In next month's *RSNA News*, we explore the programs that are becoming increasingly popular with residents.

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