MR Imaging Unit in Afghanistan Gives Soldiers Front-line Treatment

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The RSNA/American College of Radiology Workshop on Data Needs for Comparative Effectiveness Research in late 2012 was co-chaired by Constantine Gatsonis, Ph.D., and Alfredo E. Buzzi, M.D., 2012 Argentine Society of Radiology president.

The group will develop a white paper to identify the categories of data needed for CER, propose a minimum information set and how this information can be made available. Percent of pancreatic ductal adenocarcinoma (PDAC) patients who have 5-year survival rate, according to the American Cancer Society. Read about new research offering a promising path to earlier detection and more effective treatment of the disease on Page 12.

The number of 1.5 Tesla MRI imaging machines in operation near combat zones in the Middle East. Read more about the unique role a mobile MRI imaging unit is playing in treating U.S. soldiers in war-torn Afghanistan on Page 13.

Number of education credits required to earn a Certification of Achievement from the Academy of Radiology and Leadership Management (ARLM). Read more about opportunities to enhance and develop your career through ARLM on page 12.

The Association of American Medical Colleges (AAMC) named Richard Gunderman, M.D., Ph.D., the recipient of the 2012 Alpha Omega Alpha Robert Glaser Distinguished Educator Award at its recent annual meeting in San Francisco. Dr. Gunderman, professor of radiology at Indiana University, is a past recipient of the RSNA Outstanding Educator Award and the American Roentgen Ray Society (ARRS) Distinguished Educator Award and is a nine-time recipient of the Indiana University Trustees Teaching Award. He is the second radiologist to receive the AAMC’s top award for teaching, which was created in 1968.

GUNDERMAN RECEIVES TOP AAMC TEACHING AWARD

The Royal Australian and New Zealand College of Radiologists (RANZCR) Bestows Honors

The Royal Australian and New Zealand College of Radiologists (RANZCR) recently combined its 63rd Annual Scientific Meeting with the Asian Oceanian Society of Radiology (AOSR) to hold the 14th Asian Oceanian Congress of Radiology (AOCR) in Sydney, Australia. RANZCR and AOSR announced several awards at the event. The RANZCR Gold Medal was awarded to Mark Khandugre, M.B.B.S., a private practice neuroradiologist and former head of the Department of Diagnostic and Interventional Radiology and director of imaging services at Royal Perth Hospital in Western Australia. RANZCR’s Roentgen Medal was awarded to Greg Slater, M.B.B.S., radiologist and partner at Queensland X-Ray in Queensland, Australia, and president-elect of RANZCR. AOSR Gold Medals were awarded to 2010 RSNA President Hedvig Hricak, M.D., Ph.D., Dr. h.c., Kenneth Thomson, M.B.B.S., and Hans Rintgerz, M.D., Ph.D. Dr. Hricak is chair of the Department of Radiology at Memorial Sloan-Kettering Cancer Center in New York, a professor of radiology at Cornell University Medical College and an attending radiologist at Memorial Hospital in New York. Dr. Thomson is a professor and the director of radiology at the Alfred Hospital in Melbourne, Australia. Dr. Rintgerz, recipient of the RSNA Special Presidential Award in 2010, is a professor emeritus at the Linköping University Hospital and the Karolinska University Hospital in Stockholm and a visiting professor at Stanford University.

RANZCR Bestows Honors

The Royal Australian and New Zealand College of Radiologists (RANZCR) Bestows Honors

The Royal Australian and New Zealand College of Radiologists (RANZCR) Bestows Honors

Honorary membership was awarded to 2010 RSNA President Hedvig Hricak, M.D., Ph.D, Dr. h.c., Donald Frush, M.D., Edward Y. Lee, M.D., Edardo Gonzalez Toledo, M.D., Sylvia Neueschwan, M.D., and Gloria Soto Giordani, M.D., at the Argentine Society of Radiology recent annual meeting in Buenos Aires. Dr. Hricak is chair of the Department of Radiology at Memorial Sloan-Kettering Cancer Center in New York, a professor of radiology at Cornell University Medical College and an attending radiologist at Memorial Hospital in New York. Dr. Frush is chief of the Division of Pediatric Radiology at Duke University in Durham, N.C., chair of the RSNA Refresher Course Committee and a member of the RSNA Public Information Advisors Network. Dr. Lee is chief of the division of thoracic imaging and director of magnetic resonance imaging at Boston Children’s Hospital. He is a member of the AOSR News Editorial Board, RSNA Public Information Advisors Network and the Health Services Policy and Research Subcommittee of the Scientific Program Committee. Dr. Gonzalez Toledo is a professor and the director of Neuroradiology and Research at Louisiana State University Health Sciences Center Shreveport. Dr. Neueschwan is head of imaging at the Curie Institute in Cedex, France, and is a past-president of the French Society of Radiology. Dr. Soto is a past-president of the Chilean Society of Radiology.

Workshop Defines Data Needed for CER Studies

The RSNA/American College of Radiology Workshop on Data Needs for Comparative Effectiveness Research (CER) of Diagnostic Imaging brought together a diverse group of researchers and technology developers to address the questions of what information is needed for the successful conduct of CER studies of diagnostic imaging and how this information can be made available. The workshop in late 2012 was co-chaired by Constantine Gatsonis, Ph.D., and Jonathan Levin, M.D. and included participants from research and clinical academia, the information and device industry and government. Topics discussed included structured reporting of diagnostic study results and interoperability of IT systems in routine collection of clinical data. The group will develop a white paper to identify the categories of data needed for CER, propose a minimum information set and discuss current gaps and barriers to the availability of this information. The paper will also survey the current information systems, identify challenges in ensuring the interoperability of systems and highlight recent developments and promising directions.

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There is an art to being both humanistic and scientific as we treat our patients and bring them the best of both worlds.

RSNA President Dr. George Bissel’s presidential address closed the session with an enthusiasm about our profession that they hadn’t felt for some time. Dolsett beautifully into the overtures of putting our patients first was the launch of RSNA’s campaign Radiology Cares: The Art of Patient-Centered Practice. The campaign is the evolution of many patient-centered radiology courses, workshops and other activities presented throughout the years and is overseen by the Patient-Centered Radiology Steering Committee, which I’m honored to chair. Amid all the significant scientific and technological breakthroughs, there is an art to understanding our patients and appreciating their experiences in the radiology department and bringing them the best of both worlds.

Being patient-centered isn’t just about talking to your patients. It’s about more. It’s an assurance that we treat our patients with an enthusiasm about our profession as they have not felt for some time. Dolsett beautifully into the overtures of putting our patients first was the launch of RSNA’s campaign Radiology Cares: The Art of Patient-Centered Practice. The campaign is the evolution of many patient-centered radiology courses, workshops and other activities presented throughout the years and is overseen by the Patient-Centered Radiology Steering Committee, which I’m honored to chair. Amid all the significant scientific and technological breakthroughs, there is an art to understanding our patients and appreciating their experiences in the radiology department and bringing them the best of both worlds.

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MR Imaging Unit in Afghanistan Gives Soldiers Front-line Treatment

Since 2011, mobile MR imaging has played a surprising and unique role in diagnosing and treating mild traumatic brain injuries (mTBI) and other afflictions suffered by U.S. soldiers in war-torn Afghanistan, according to the presenter of an RSNA 2012 session.

MR imaging is greatly improving care to wounded warriors, many of whom suffer head injuries from roadside bombs, said Lt. Col. Sean Jersey, M.D., a third-year radiology resident at David Grant Medical Center, Travis Air Force Base, California, who discussed the current and future role of mobile MR imaging in combat and the clinical benefit and types of diseases identified with the modality.

Although he was not able to attend RSNA 2012, Lt. Col. Robert Jesinger, M.D., Task Force Medical East Expedient Support Squadron radiology flight commander, deployed to Afghanistan in 2012 and led the project to expand MR imaging in a combat war zone.

“Teleradiology links between Afghanistan and the United States allow us to gather data from our hightech MR imaging on host nationals, military contractors and Special and U.S./NATO Forces and others who otherwise would not have immediate access to MR technology,” Dr. Jersey said.

“While U.S./NATO troops could be removed from the combat zone for MR imaging, more rapid diagnosis of conditions with mobile MR imaging has been value-added in their care,” Dr. Jersey said. “And local nationals—who cannot leave the country—can be considered for MR imaging when under U.S./NATO care and when medically warranted.”

While TBI is a signature injury of war, the ability to peer into the brain and see the injury, diagnose it, and actually examine the injury is relatively new, said Dr. Jersey, who reviewed cases remotely via teleradiology links between Afghanistan and the U.S. “Mobile MR imaging allows us to gather data on mild traumatic brain injury in the combat zone, diagnose mission-changing injuries such as neurological decompression sickness and musculoskeletal injuries in Special Forces troops, diagnose conditions only identifiable with MR imaging and even image military working dogs,” he said.

“Medical people are deployed to the front line with the troops,” Dr. Jersey added. “These guys are getting a lot of stabilization treatments right on the front line. They’re getting a lot better treatment. MR imaging has future potential in helping detect possible early signs of TBI,” Dr. Jesinger said.

“If you do a CT for TBI, you are usually looking for big problems, such as a head bleed,” Dr. Jesinger said. “MRI is geared to find subtle problems. If someone has had a concussion and we do an MRI and identify brain injury, then that’s a big deal. If we don’t see anything with an MRI, then it may be that there is nothing there, but we hope to find MRI as a helpful distinguishing tool. Treatment guidelines for head injury can be upgraded and more aggressive treatment can be done for someone with a head injury and visible results on an MRI, than if there are no indicators. Knowing that information sooner helps treatment to get initiated sooner.”

Current results and future potential of MR imaging are worth the considerable effort put into buying and transporting the equipment, Drs. Jesinger and Jersey said. The U.S. Congress collaborated with the chairman of the Joint Chiefs of Staff to fund placement of the three mobile 1.5 Tesla MR imaging machines, including the one operated by the U.S. Air Force at Bagram Air Base in Afghanistan.

Physically getting the mobile imaging machine to the Bagram Air Base in Afghanistan was a major undertaking that took weeks, Dr. Jersey said. It was also years in the making, creating a controversy as to whether or not it was worth the millions it cost, he said.

Role of MR Imaging Expands to Myriad Conditions

While the main purpose of MR imaging in a combat zone was for research and gathering data on U.S./NATO troops with brain injuries, the modality’s role has been carefully expanded to include medical conditions where results will change mission requirements and/or medical management, Dr. Jersey said.

Examples include the use of MR imaging on a 19-year-old Army specialist who had experienced three weeks of left hip pain, limiting her duties. Her physical exam and radiographs were not diagnostic and after the soldier’s orthopedic surgeon requested an MRI, she was diagnosed with an iliac wing sarcoma, Dr. Jersey said.

In another case, MR imaging revealed an unstable T3 burst fracture in a 22-year-old Marine who fell and injured his upper thoracic spine. The celluli and osteomyelitis were discovered in a Special Forces troop member through MR and an acute biceps tendon tear was detected in a 25-year old Special Forces soldier who injured his elbow during combat.

With MR imaging, an F-16 pilot with an acute right knee chondral injury was deemed unable to safely or effectively fly a combat aircraft, while a U-2 pilot was diagnosed with neurologi-
Radiation oncologists are using increasingly complex cross-sectional imaging techniques to improve the accuracy of their radiation therapy planning contours, despite little formal training in diagnostic imaging, said Noel Young, M.D., a radiologist at the University of Western Sydney in Sydney and co-author of the paper, “Incorporating a Radiologist in a Radiation Oncology Department: A New Model of Care?”

“Contour accuracy is essential in conformal techniques like intensity-modulated radiation therapy,” Dr. Young said. “There is need for a more reliable imaging review.”

Dr. Young and colleagues studied the impact of having a radiology fellow in the radiation oncology department over a nine-month period. The fellow provided radiological advice on diagnostic and treatment planning images for two sessions per week and reviewed the accuracy of the patient’s tumor contours for the weekly quality assurance audit meetings.

“The oncology staff was able to book time slots with the radiologist and complete a feedback questionnaire afterward,” Dr. Young said.

There were 49 consultation sessions during the study period, including a review of 56 diagnostic imaging or treatment planning scans. The radiologist’s advice resulted in a change of patient management in 25 percent of cases and recommendations for further evaluation in another 20 percent. Changes to target volume and normal tissue volume were among the radiologist’s recommendations.

“A good percentage of patients benefited from this interaction and the oncologists were open-minded about having changes made to their target planning,” Dr. Young said.

In one case, the planning CT revealed a vertebral lesion in a patient with potentially metastatic prostate cancer. The radiologist confirmed the finding as a benign tumor on an earlier diagnostic CT, avoiding unnecessary further imaging or biopsy.

“A radiologist who is located within the department has access to the patient’s clinical notes and other multimodality diagnostic imaging and time to review the planning scans in detail prior to the meeting,” said study co-author Marion Dimigen, M.D., from Liverpool Hospital in Sydney. “This results in a qualified interpretation of imaging leading to better radiation oncology care.”

The radiologist also reviewed 94 CT scans for the quality assurance audit meetings. Queries over the accuracy of the contours resulted in a significant change in management in six patients. Dr. Young displayed images from one case where the radiologist had added a nearby lymph node group to the target area in a patient with Merkel cell carcinoma, a rare form of skin cancer.

“Functional imaging has access to the patient’s clinical notes and imaging review,” Dr. Young added. “We’ve seen unnecessary further imaging or biopsy be avoided.”

“A radiologist who is located within the department may become the new model of care as radiation therapy planning imaging becomes more complex,” Dr. Young said.

The rationale behind this being a fellowship position is to conduct collaborative research between the two specialties,” Dr. Dimigen said. “However an alternative model of care may be funding a radiologist for sessions within the radiation oncology department to review diagnostic and radiotherapy planning images for direct clinical care.”

“Having more clinical interaction between radiology and clinical medicine—in this case, cancer care—is the way of the future,” Dr. Young added.

Radiologists spent nine months training in therapy, said Dr. Zietman, delivering the Annual Oration in Radiation Oncology at RSNA 2012. “During the 40s and 50s, small groups of radiologists began concentrating more on therapy and less on diagnosis. These physicians argued that therapy was a separate area, and that nine months of training was woefully inadequate.”

RSNA annual meetings in the 1950s became occasions for unofficial gatherings of fledgling radiation oncologists at Chicago restaurants—Dr. Zietman showed an invitation to one such meeting at Barney’s Steakhouse—and in 1958, the radiation oncologists ended up forming the American Club of Radiation Oncologists, precursor to the American Society for Radiation Oncology (ASTRO). The development of specialized radiation oncology residency training programs followed and, by the late 1960s, two completely separate specialties had been established.

“The amicable divorce between therapy and diagnosis was complete,” Dr. Zietman said.

The ensuing decades saw both specialties prosper. Diagnostic radiology spun off its own therapeutic branch—interventional radiology—with many subspecializing in cancer therapy using ablative techniques, while radiation oncology became the most sought after residency in the U.S., according to Dr. Zietman. But troubles loom on the horizon for both specialties, he warned, due to an increasing reliance on technology.

“The problem is that as you become more and more technological, you make yourself less and less necessary,” he said. “The art of radiotherapy has progressively been lost as we’ve taken a technological focus.”

“Radiation oncologists are good at treating small lesions, and less good at treating bulk tumor, while interventional radiologists handle bulk tumor much better with their ablative techniques,” Dr. Zietman said. “Think how powerful it would be if we could put them together.”

Pilot programs that offer a hybrid specialty to interested medical residents would be a good way to bring the erstwhile partners back together, Dr. Zietman suggested. Obstaciles to a union remain, including tradition, self-interest and training concerns, but Dr. Zietman said that strengthening the bond between radiology and radiation oncology is essential to protect each specialty from becoming irrelevant.
“Brazil Presents” Spotlights Latest MR Imaging Techniques

Radiology remains integral to the growth of healthcare in Brazil, according to presenters who offered the latest state-of-the-art in MR imaging during the “Brazil Presents” session at RSNA 2012.

Brazil, which offers universal health coverage that is utilized by 75 percent of the public, is now the fifth-largest buyer of MR imaging devices in the world, according to moderator Pedro Daltro, M.D., who outlined the country’s healthcare expenditures, including medical diagnostics.

Douglas Racy, M.D., whose presentation focused on factors that can influence the quality of MR imaging, was among the Brazilian presenters who demonstrated highly advanced techniques in a variety of MR applications.

“There are tradeoffs for MR imaging parameters,” Dr. Racy explained. “Often we cannot gain advantage in one parameter without sacrificing another.” He outlined techniques to ensure the appropriate tradeoffs for various clinical indications, emphasizing the best quality in the shortest acquisition time.

In his visually engaging presentation of advanced fetal MR imaging technology, Dr. Daltro explained how 3D simulation videos can be created to demonstrate a virtual path through anatomical structures and how, for example, a facial mass can obstruct the airway. He also showed how imaging can guide molds for physical models of the fetus and internal structures.

“In Brazil’s largest medical institutions are conducting cutting-edge research, offering postgraduate courses and training a new class of radiologists whose skills will benefit the country at large,” Dr. Gomes da Silva said.

Dr. Gomes da Silva

The MR imaging research is a good example of the promise Brazil holds for the future, according to Manoel Aparecidos Gomes da Silva, M.D., president of the Colégio Brasileiro de Radiologia e Diagnóstico por Imagem (Brazilian College of Radiology and Diagnostic Imaging), who gave the opening address at Brazil Presents.

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Future of Research in Brazil is Promising

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“Future of Research in Brazil is Promising”

RSNA has partnered with the Radiological and Diagnostic Imaging Society of São Paulo (SPR) for the joint planning of Jornada Paula de Radiologia (JPR) in 2014, 2016 and 2018. JPR is the leading medical imaging meeting in Latin America.

RSNA forms international alliances to develop and enhance the contact between radiologists and professionals from various regions of the world. Collaborating on scientific meetings like JPR is an important example of this work. After many years of attending JPR meetings, RSNA and SPR leaders decided that a partnership would benefit their shared goal of advancing radiologic science and education internationally. They agreed to work together to plan and implement a meeting in 2014, designed to showcase some of the best work offered by both organizations.

In 2014, 2016, and 2018, RSNA will work closely with SPR to plan meeting content, provide speakers and assist in developing materials and courses that are not typically offered at JPR.

“We look forward to collaborating with SPR on a variety of initiatives to bring unique opportunities to radiologists in Brazil,” said Richard L. Baron, M.D., RSNA Board Liaison for International Affairs. “Initially, this endeavor will begin with RSNA participating in the JPR program planning and sending expert speakers to help facilitate nontraditional sessions.”

The partnership is expected to extend beyond the meeting to promote membership in both organizations.
Lean Job Market Makes Enlisting, Retaining Staff Critical

With market forces and new federal policies prompting cutbacks in radiology hiring, academic institutions and private practices must focus on recruiting—and keeping—the best possible staff for the positions they do have, experts say.

“The current situation is certainly a recruiter’s dream, a trainee’s nightmare,” said C. Douglas Maynard, M.D., professor emeritus of radiology at Wake Forest University in Winston-Salem, N.C., and 2008 RSNA President. Dr. Maynard was one of four presenters of the RSNA 2012 session, Recruiting and Retaining Radiologists and Staff. “We've been here before—and this has happened in my lifetime at least three times,” he said. “Until the economy recovers, it's not likely we'll have additional jobs available.”

A faculty vacancy survey Dr. Maynard has been conducting over the last dozen years with the Society of Chairs of Academic Radiology Departments (SCARD) members and other radiology chairs shows a steady decline in available positions in academic radiology. Certain subspecialties such as pediatric radiology, interventional radiology and breast imaging remain difficult positions to fill, Dr. Maynard said.

Exacerbating the economic pressures against creating new positions is the fact that physicians are not retiring, further reducing the vacancies available to new radiologists. While there is increased demand for night coverage, a number of department chairs have suggested decreasing the number of residents and fellows, Dr. Maynard said.

“Some practices are actually downsizing faculty and letting staff members go,” he said. “The market out there is extremely tough.”

Top-notch Recruitment Essential to Faculty Quality

Academic radiology practices looking to fill their precious open positions with exemplary staff are wise to start by recruiting the best possible residents, training them well and exposing them to the exciting environment from the onset, said session presenter R. Gilbert Jost, M.D., the Elizabeth Mallinckrodt Professor of Radiology and chair of the Department of Radiology at the University of Colorado School of Medicine in Aurora.

“Learning to be a great radiologist can be a challenging experience, but it shouldn’t have to be a painful one.”

R. Gilbert Jost, M.D.

While factors like salary, location, vacation and clinical focus can make private practices more desirable to job candidates than academic institutions, some private practices are adopting a cost-cutting model of operating smaller practices and eliminating less profitable imaging exams, Dr. Borgstede said.

More appropriate, Dr. Borgstede said, is a strategy to retain quality radiologists and recruit physicians who have IT and decision support expertise along with the skills to fill areas of clinical shortage. “There will be a shortage of radiologists in the future so the specialty should make no drastic changes in residency positions,” Dr. Borgstede said. “Groups should prepare for competition for new hires in the future.”

Due Diligence Necessary Before Joining Private Practice

Regardless of the market, the recruiting/application process always has two sides, said RSNA session presenter William T. Thorwarth Jr., M.D., a radiologist/partner at Catawba Radiological Associates in Hickory, N.C., and RSNA Board Liaison for Publications and Communications. He urged both parties in employment negotiation to do their due diligence.

“Joining a group is like entering a marriage,” Dr. Thorwarth said. “It is expensive in time and money for both parties, so make it worth your effort.”

The radiology job market has been a roller coaster, “and everyone wishes for a crystal ball but it doesn't exist,” Dr. Thorwarth said. In the meanwhile, applicants and employers alike should commit to honesty and transparency, he said.

“Practices and applicants should look at their own needs and desires and do their best to match those with the other,” he said.

The current economic climate has created “a recruiter’s dream and a trainee’s nightmare,” according to presenters of the RSNA 2012 session, “Recruiting and Retaining Radiologists and Staff,” who urge both parties in employment negotiation to do their due diligence before accepting or offering a position.

ARLM COURSES OFFERED AT RADIOLOGY MEETINGS IN 2013

The RSNA 2012 session, “Recruiting and Retaining Radiologists and Staff,” was among the wide variety of RSNA 2012 courses sponsored through the Academy of Radiology Leadership and Management (ARLM), dedicated to offering radiology professionals the opportunity to enhance and develop as leaders.

ARLM is sponsored by five participating radiology education societies, including RSNA, which continues to offer courses either online or in-person at meetings throughout 2013.

Medical imaging professionals can earn a Certificate of Achievement from ARLM by earning 50 education credits—at least 30 credits in person—across a spectrum of core learning domains, including Financial Skills, Human Resources, Professionalism, Legal/Contracting, Academic Mission and General Management. A minimum of three credits in each domain is required.

There are no fees beyond costs associated with CME activities, and many of those are free to members of the respective sponsoring societies.

To view the course catalog for 2013 and for more information on ARLM, go to www.radleaders.org/index.cfm.

The RSNA 2012 session, “Recruiting and Retaining Radiologists and Staff,” was among the wide variety of RSNA 2012 courses sponsored through the Academy of Radiology Leadership and Management (ARLM), dedicated to offering radiology professionals the opportunity to enhance and develop as leaders.
Research Spurs Progress in Pancreatic Cancer Diagnosis

A new biomarker with potential for improving early detection of pancreatic ductal adenocarcinoma (PDAC), which is one of the deadliest of cancers, has led one researcher down a promising path to earlier detection and perhaps better treatment.

Part of the reason PDAC is so lethal is that patients often have no symptoms until the disease has reached an advanced stage and treatments like surgery and chemotherapy are rarely curative. As a result, the 5-year survival rate for PDAC is only 4 percent, according to the American Cancer Society.

Researcher Joshua Dowell, M.D., Ph.D., knew that a certain protein, Plectin-1 (Plec-1), is buried in a cell’s cytoplasm, but in PDAC it migrates to the cellular membrane, making it a conspicuous marker for disease. Through a $30,000 Bracco Diagnostics/RSNA Research Resident Grant, Dr. Dowell developed a novel diagnostic and treatment approach to PDAC as a radiology resident at the University of Virginia in Charlottesville in 2010.

“Plec-1 is overexpressed in PDAC and clearly distinguishes PDAC from inflammatory and pre-malignant pancreatic changes,” said Dr. Dowell, now an assistant professor of interventional radiology at The Ohio State University Wexner Medical Center in Columbus.

Dr. Dowell worked with two professors in the University of Virginia’s Biomedical Engineering Department, Kimberly Kelly, Ph.D., and Alexander L. Klibanov, Ph.D., to develop a synthetic agent that targets Plec-1 in PDAC. The agent is a peptide paired with a liposome that can be engineered to carry drugs, dyes and imaging agents. Dr. Dowell and colleagues proposed linking liposomes carrying fluorescent DiR dye to a Plec-1 targeting peptide to study its uptake in pancreatic cancer cells.

Using the RSNA grant funding, Dr. Dowell and colleagues tested the new targeted agent on mice with human pancreatic cancer implanted under their skin. Using fluorescence molecular tomography (FMT), the researchers compared the efficacy of the targeted liposomes with control liposomes that did not have the Plec-1 targeting peptide.

Preliminary results presented at RSNA 2011 showed that the targeted agent delivered high payloads of DiR dye with a high degree of specificity to the pancreatic tumors. “There was an eight-fold increase in accumulation of dye over controls at 20 hours post-injection,” said Dr. Dowell, who received a Trainee Research Prize for his RSNA 2011 presentation. “This increased accumulation of dye within the subcutaneous pancreatic tumors persisted one week post-injection.”

“Without them, we wouldn’t get funds to do this more risky science,” Dr. Dowell added. “These grants are incredibly important,” Dr. Kelly added.

“Currently, researchers are working to optimize the technique to allow loading higher doses of drugs and contrast agents onto the liposomes. No matter what direction his studies take, Dr. Dowell credits the RSNA R&E grant for establishing his career as a researcher and paving the way for further grants. ‘I’m grateful and honored to be an RSNA grant recipient,’ Dr. Dowell said. ‘It has given me great opportunities to extend my research beyond the fellowship stage and continue to develop as a physician-scientist.’

“These grants are incredibly important,” Dr. Kelly added. “Without them, we wouldn’t get funds to do this more risky science.” Dr. Dowell could one day prescribe a drug that he created with the help of this grant.”

Dr. Dowell’s development of the PDAC-targeted imaging agent has clinical implications: “Agents which allow for earlier detection would be useful in screening patients at high risk, such as those with a family history,” Dr. Dowell said. “Currently, there are no great ways to screen such patients.”

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Dr. Dowell Targeted Agent Has Possible Therapeutic, Diagnostic Applications

The targeted agent is a potential tool in the burgeoning field of theranostics, in which one drug can have both therapeutic and diagnostic applications. Besides providing earlier detection of pancreatic lesions, the novel Plec-1-targeted imaging agent may allow for higher doses of radiolabeled and chemotherapy drugs, Dr. Dowell said.

These results, although preliminary, are of great interest as a platform to deliver high payloads of chemotherapy,” he said. “We hope that by targeting the cancer we can lower the side effects associated with the drugs.” Indeed, early results using gemcitabine-loaded, targeted liposomes are promising. “We were able to deliver more small molecules to the tumor when targeting with Plec-1 than when not targeting with it and we saw some tumor-specific killing,” Dr. Kelly added.

Dr. Dowell noted that while chemotherapy is typically given to patients with PDAC to relieve pain and improve quality of life, higher levels of the drugs might increase the possibility of a cure. Targeted agents such as these may also offer the possibility of early detection, he said. “Agents which allow for earlier detection would be useful in screening patients at high risk, such as those with a family history,” Dr. Dowell said. “Currently, there are no great ways to screen such patients.”

GRANTS IN ACTION

NAME: Joshua Dowell, M.D., Ph.D.

GRANT RECEIVED: $30,000 Bracco Diagnostics/RSNA Research Resident Grant, 2010

STUDY: Plectin-1 Targeted Liposomes for Possible Early Detection and Treatment of Pancreatic Adenocarcinoma.

CASE STUDY: Dr. Dowell continues to be interested in the early detection and treatment of targeted cancers. Additionally, his educational project, “A Pharmacopeia iPhone/iPad Mobile Communication Application for the Interventional Radiologist,” was funded by a 2011-2012 RSNA/AUR/APDR/SCARD Education Research Development Grant. “These RSNA grants have, and will continue to have, an impact on my career and future as I develop as a physician-scientist,” Dr. Dowell said.

A Pharmacopeia iPhone/iPad Mobile Communication Application for the Interventional Radiologist was funded by a 2011-2012 RSNA/AUR/APDR/SCARD Education Research Development Grant. “These RSNA grants have, and will continue to have, an impact on my career and future as I develop as a physician-scientist,” Dr. Dowell said.

CLINICAL IMPLICATIONS: Dr. Dowell’s development of the PDAC-targeted imaging agent may allow earlier detection of pancreatic lesions based on molecular signature and serve as a platform for targeted therapies for pancreatic cancer.

For more information on all R&E Foundation grant programs, go to RSNA.org/Foundation or contact Scott Waller, M.A., Assistant Director, Grant Administration at 1-630-577-9818 or swaller@rsna.org.
In memory of Robert Macionas, M.D.

Our Donations in Action

Continued on Page 23
Predicting Cognitive Decline in Subjects at Risk for Alzheimer Disease by Using Combined Cerebrospinal Fluid, MR Imaging, and PET Biomarkers

Intrathecal and cerebrospinal fluid (CSF) biomarkers can improve prediction of conversion from mild cognitive impairment (MCI) to Alzheimer disease (AD) compared with predictions based on clinical parameters, according to new research.

Jennifer L. Shaffer, M.D., of Duke University Medical Center, Durham, N.C., and colleagues examined 97 patients with MCI from the Alzheimer Disease Neuroimaging Initiative (ADNI), a national multicenter biomarker study in which patients are followed serially to track disease progression. MR imaging-derived gray matter probability maps and FDG PET images were analyzed by using independent component analysis, an unbiased data-driven method to extract independent sources of information from whole-brain data. Combining MR imaging, FDG PET, and CSF data with routine clinical tests significantly increased the accuracy of predicting conversion to AD compared with clinical testing alone. The misclassification rate decreased from 41.5 percent to 28.4 percent, results showed.

“Among these three imaging and molecular biomarkers, FDG PET appears to be the primary contributor, with misclassification rates for FDG PET, MR imaging, and CSF compared with clinical variables alone of 27.2 percent (P = .00001), 39.2 percent (P = .08), and 39.6 percent (P = .32), respectively,” the authors concluded.

A Controlled Trial of Revascularization in Acute Stroke

Intraarterial recanalization with stents was an effective and safe treatment option in patients with acute middle cerebral artery (MCA) occlusion with contraindication to intravenous thrombolysis (IVT) or after IVT failure, according to the results of a controlled trial.

Martin Reuber, M.D., Ph.D., of Ostrava University Hospital Ostrava, examined 131 patients (74 men and 57 women) with acute ischemic stroke (AIS) due to MCA occlusion; 75 underwent IVT. No further recanalization and three-month clinical outcome were evaluated.

“Cerebral PTA with stent placement seems to be a safe endovascular treatment option for pediatric patients and CT/MR during pregnancy. The app contains 18 videos to help illustrate content.

EXAMPLES

- 33-year-old men with early-stage cancer who undergo CT surveillance incur a slightly higher lifetime mortality risk from testicular cancer (598 per 100,000; 95 percent uncertainty interval [UI]: 302, 894) than from radiation-induced cancers (505 per 100,000; 95 percent UI: 280, 730). However, lifetime expectancy loss attributable to testicular cancer (83 days; 95 percent UI: 42, 124) was more than three times greater than lifetime expectancy loss attributable to radiation-induced cancers (24 days; 95 percent UI: 13; 35).

“Lifetime risk metrics do not account for the delayed timing of radiation-induced cancers over the course of a patient’s lifetime; as a result, radiation-induced cancer risks may be overemphasized relative to more immediate health risks in many clinical settings,” the authors write.

Patients with Testicular Cancer Undergoing CT Surveillance Demonstrate a Pitfall of Radiation-Induced Cancer Risk Estimates: The Timing Paradox

Lifet ime radiation risk estimates, when used for decision making, may overemphasize testicular cancer risks relative to short-term health risks, new research shows.

Par V. Pandharipande, M.D., M.P.H., of the Massachusetts General Hospital Institute for Technology Assessment, and colleagues developed a Markov model to project outcomes in patients with testicular cancer undergoing CT surveillance in the decade after orchietomy. To quantify effects of early versus delayed risks, life expectancy losses and lifetime mortality risks due to testicular cancer were compared with life expectancy losses and lifetime mortality risks due to radiation-induced cancers from CT. Projections of life expectancy loss—unlike lifetime risk estimates—account for the timing of risks over the course of a lifetime, which enabled evaluation of the described limitation of lifetime risk estimates.

Researchers projected that 33-year-old men with early-stage cancer who undergo CT surveillance incur a slightly higher lifetime mortality risk from testicular cancer (598 per 100,000; 95 percent uncertainty interval [UI]: 302, 894) than from radiation-induced cancers (505 per 100,000; 95 percent UI: 280, 730). However, lifetime expectancy loss attributable to testicular cancer (83 days; 95 percent UI: 42, 124) was more than three times greater than lifetime expectancy loss attributable to radiation-induced cancers (24 days; 95 percent UI: 13; 35).

“Lifetime risk metrics do not account for the delayed timing of radiation-induced cancers over the course of a patient’s lifetime; as a result, radiation-induced cancer risks may be overemphasized relative to more immediate health risks in many clinical settings,” the authors write.

Example from two separate ICAs. 2 threshold was 1.5. Both components significantly differentiated converters from nonconverters. Left: The MR imaging component (Comp) highlights in red the bilateral medial temporal lobes, inferior and lateral temporal lobes, and anterior and inferior frontal lobes, consistent with hypometabolism in these regions in converters. Negative signal, noted in blue, is seen in the periventricular white matter, consistent with higher levels of white matter disease in converters. Right: The FDG-PET component highlights in red the temporallobarial lobes, right greater than left, and the posterior cingulate region, consistent with hypometabolism in these regions in converters.

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Interventional Oncologic Approaches to Liver Metastases

Image-guided interventional techniques are powerful tools in the management of secondary liver malignancies. These approaches aim to either allow patients with unresectable tumors to become surgical candidates, provide curative treatment options in nonsurgical candidates or improve survival in a palliative or even curative approach.

In a State-of-the-Art Review and Commentary in the February issue of Radiology (RSNA.org/Radiology), Andreas H. Mahnken, M.D., M.B.A., M.M.E., E.B.I.R., and colleagues review the rationale, application and clinical results of each of these techniques on the basis of the current literature and discuss future prospects such as gene therapy and immunotherapy. Specifically, the authors discuss:

- Portal vein embolization
- Hepatic artery infusion chemotherapy
- Transarterial chemoembolization
- Radioembolization
- Radiofrequency ablation

"With modern ablation techniques such as microwave ablation on their way to routine practice and highly innovative techniques such as intraarterial gene therapy in very early stages of development, interventional oncology will gain further ground in the treatment of liver metastases," the authors conclude.

US Appearance of Ductal Carcinoma in Situ

Ductal carcinoma in situ (DCIS), which accounts for 25 percent of all breast cancers diagnosed in the U.S., can have a variable appearance at ultrasound. Advances in ultrasound have improved the ability not only to characterize mammographic masses and asymmetries but also to detect calcifications. Because of increased implementation of ultrasound for screening and for targeted evaluation of breast MR imaging abnormalities, recognizing the ultrasound features of DCIS has become increasingly important.

In an article in the January-February issue of RadioGraphics (RSNA.org/RadioGraphics), Lilian C. Wang, M.D., of Northwestern Memorial Hospital, Northwestern University, Chicago, and colleagues discuss the ultrasound features of calcified DCIS, noncalcified DCIS and DCIS diagnosed at MR imaging-directed (“second-look”) ultrasound. Optimal imaging techniques, relevant pathologic findings and the diagnostic utility of ultrasound in the detection of DCIS are also discussed by authors.

Ultrasound features are nonspecific and careful correlation with respect to lesion location, size, shape and depth is needed, according to the authors. The presence of internal vascularity can help increase the positive predictive value of ultrasound in this setting.

"With improved technology and the increased use of ultrasound and MR imaging, recognizing the ultrasound features of DCIS will become increasingly important for the detection of early-stage breast cancer," the authors write.

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RSNA Offers Affordable Membership as Residents Transition into Practice

While members-in-training receive free RSNA membership, members transitioning from training qualify for greatly reduced rates during their first and second years of practice—just $100 in year one and $200 in year two. It is not until the third year of practice that transitioning members pay standard membership dues.

This RSNA benefit gives individuals time to settle into the profession before paying full membership dues. Under the program, residents receive all the benefits of full membership, including subscriptions to Radiology, RadioGraphics and RSNA News, free admission (with advance registration) to the annual meeting and free access to online CME opportunities.

For more information about transitioning rates, contact the Membership Department at 1-877-RSNA-MEM (1-877-776-2636) or membership@rsna.org.

Residents & Fellows Corner

Roentgen Award Nominations Being Accepted

Nominations are being accepted now for the RSNA Roentgen Resident/Fellow Research Award, recognizing residents and fellows who have contributed significantly to advancing their departments through research as evidenced by presentations and publications of scientific papers, receipt of research grants or other contributions. One resident or fellow per ACCME-approved program can be nominated by the program director or department chair.

The RSNA Research & Education (R&E) Foundation provides an award plaque, an honorarium to the department to display and a personalized award to present to the selected resident or fellow. The nomination deadline is April 1. Learn about the nomination process and see a list of past recipients at RSNA.org/Roentgen_Research_Award.aspx.
RSNA 2013 Online Abstract Submission Now Open

The online system to submit abstracts for RSNA 2013 is now active. The submission deadline is 12 p.m. Central Time on Wednesday, April 10, 2013. Abstracts are required for scientific presentations, education exhibits, applied science and quality storyboards. To submit an abstract online, go to RSNA.org/abstracts. The easy-to-use online system helps the Scientific Program Committee and Education Exhibits Committee evaluate submissions more efficiently. For more information about the abstract submission process, contact the RSNA Program Services Department at 1-877-776-2227 within North America. The RSNA 2012 Virtual Meeting attracted more than 6,336 attendees classified as “guest” or “other.” Thirty-six percent of professional attendees were from outside North America. The RSNA 2012 Virtual Meeting attracted more than 6,000 attendees from 107 countries.

Important Dates for RSNA 2013

April 10: 2013 Call for abstracts deadline
May 8: Member registration and housing open
June 5: Non-member registration open and housing opens
July 10: Course enrollment opens
October 25: International deadline to have full conference badge mailed
November 8: Final housing and discounted registration deadline
November 27: Deadline to guarantee a seat for all ticked courses
December 1-6: 99th Scientific Assembly & Annual Meeting

RSNA.org

Web Portal Helps Users Show ‘Radiology Cares’

Coinciding with the recent launch of Radiology Cares—a new RSNA initiative rallying radiologists to align their practices with their patients’ needs and best interests—RadiologyCares.org is your one-stop portal for tools, resources and information aimed at helping radiologists transform patient-centered care from a concept into practice.

Located under Science & Education on RSNA.org, RadiologyCares.org features access to a wide variety of resources related to patient-centered care, including:

- **Education Toolkit:** Your index to literature about the movement to become patient-centered, from experts, scientific journals, medical trade publications and mainstream consumer media.
- **Presentation Toolkit:** Customizable PowerPoint presentation decks to help you convey the importance of radiologists being patient-centered to your colleagues and communities.
- **RadiologyCares.org:** Direct your patients to RadiologyCares.org for information on radiology procedures, treatments and therapies.
- **Contact:** RadiologyCares@rsna.org with questions/comments about the campaign or to share your patient-centered activities.

The page also features an entertaining, three-episode video series, “Radiology Cares: The Untold Future,” illustrating why you want to become more visible to your patients. Users are also invited to “Take the Pledge” to communicate more effectively with their patients and other healthcare providers, ultimately to help patients participate in informed decision making regarding their healthcare.

The page posts a current tally of total pledges:

**COMING NEXT MONTH**

Read about the impact on radiology of the new Medicare payment rates that include payment cuts under the sustainable growth rate (SGR) formula and expansion of the multiple procedure payment reduction.
DO YOU WANT TO PRESENT AT RSNA 2013? SUBMIT ABSTRACTS FOR SCIENTIFIC PRESENTATIONS, APPLIED SCIENCE, EDUCATION EXHIBITS, QUALITY STORYBOARDS, AND QUANTITATIVE IMAGING READING ROOM SHOWCASE.

DEADLINE: WEDNESDAY, APRIL 10, 2013
12:00 NOON CHICAGO TIME

SUBMIT ONLINE: RSNA.ORG/ABSTRACTS