

## The Art of Imaging: Centennial Image Contest Winners

### ALSO INSIDE:

Advances in Head and Neck Imaging  
X-ray Truck Visits Rural Kenya  
Targeting Dose Reduction  
MRI in Preterm Healthcare  
The Radiomics Revolution

# CALL FOR ABSTRACTS

*Present at RSNA 2015*

Submit abstracts for scientific presentations, applied science, education exhibits, quality storyboards, and quantitative imaging reading room showcase.



## **Deadline:**

Wednesday, April 8, 2015  
12:00 noon Chicago Time

## **Submit Online:**

[RSNA.org/Abstracts](http://RSNA.org/Abstracts)

**100 RSNA<sup>®</sup> 2015**  
November 29 – December 4

**Questions?** Call 1-877-776-2227 (*within U.S.*)  
or 1-630-590-7774 (*outside U.S.*)

*Includes sessions in joint sponsorship with the  
American Association of Physicists in Medicine*



## FEATURES



**5** | Advances in Head and Neck Imaging



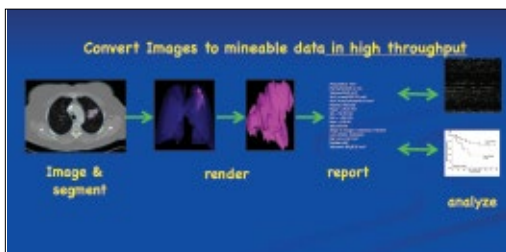
**7** | X-ray Truck Visits Rural Kenya



**9** | MRI in Preterm Healthcare



**11** | Targeting Dose Reduction



**13** | The Radiomics Revolution

## UP FRONT

**1** First Impression

**1** Numbers in the News

## RADIOLOGY'S FUTURE

**15** R&E Foundation Donors

## NEWS YOU CAN USE

**17** Journal Highlights

**19** Radiology in Public Focus

**21** Education and Funding Opportunities

**23** Residents & Fellows Corner

**23** Value of Membership

**24** Annual Meeting Watch

**24** *RSNA.org*

## RSNA MISSION

The RSNA promotes excellence in patient care and healthcare delivery through education, research and technologic innovation.



Follow us for exclusive news, annual meeting offers and more!

### EDITOR

David M. Hovsepian, M.D.

### R&E FOUNDATION CONTRIBUTING EDITOR

R. Gilbert Jost, M.D.

### EXECUTIVE EDITOR

Lynn Tefft Hoff, M.C.M.

### MANAGING EDITOR

Beth Burmahl

### RSNA NEWS STAFF WRITER

Paul LaTour

### GRAPHIC DESIGNER

Erick Jurado

### EDITORIAL ADVISORS

Mark G. Watson

*Executive Director*

Roberta E. Arnold, M.A., M.H.P.E.

*Assistant Executive Director*

*Publications and Communications*

Marijo Millette

*Director: Public Information and*

*Communications*

### EDITORIAL BOARD

David M. Hovsepian, M.D.

*Chair*

Gary J. Whitman, M.D.

*Vice-chair*

Kavita Garg, M.D.

Bruce G. Haffty, M.D.

Bonnie N. Joe, M.D., Ph.D.

Edward Y. Lee, M.D., M.P.H.

Laurie A. Loevner, M.D.

Tirath Y. Patel, M.D.

Martin P. Torriani, M.D.

Vahid Yaghmai, M.D.

Mary C. Mahoney, M.D.

*Board Liaison*

### 2015 RSNA BOARD OF DIRECTORS

Richard L. Ehman, M.D.

*Chairman*

Vijay M. Rao, M.D.

*Liaison for Information Technology and Annual Meeting*

Valerie P. Jackson, M.D.

*Liaison for Education*

James P. Borgstede, M.D.

*Liaison for International Affairs*

Mary C. Mahoney, M.D.

*Liaison for Publications and Communications*

Bruce G. Haffty, M.D.

*Liaison for Science*

Ronald L. Arenson, M.D.

*President*

Richard L. Baron, M.D.

*President-elect/Secretary-Treasurer*





## Thousands Offer Letters of Support for NIH Funding at RSNA 2014

More than 6,000 letters were sent to Congress in support of the National Institutes of Health (NIH) by visitors to the Academy of Radiology Research (ARR) booth at RSNA 2014.

Fearing a cut in NIH funding, ARR asked annual meeting attendees to take action in support of a \$32 billion request. Attendees were invited to stop by the ARR booth and use a laptop, iPad or their own mobile device to email members of Congress about the importance of preserving the future of NIH research.

On December 13, Congress passed a government funding bill that included an increase of \$150 million in base funding for NIH. Letters from RSNA 2014 attendees contributed to what ARR considers to be a sizeable increase in a year when funding cuts were anticipated.

For more information, visit the ARR website at [action.imagingcoalition.org](http://action.imagingcoalition.org).

## Apply Now for RSNA Editorial Fellowships

Applications are being accepted for the RSNA William R. Eyler Editorial Fellowship and the RSNA William W. Olmsted Editorial Fellowship for Trainees.

Both fellowships offer the opportunity to work with *Radiology* Editor Herbert Y. Kressel, M.D., in Boston and *RadioGraphics* Editor Jeffrey S. Klein, M.D., in Burlington, Vt. The Eyler fellowship lasts one month and the Olmsted fellowship lasts one week.

Each fellow will also visit the RSNA Publications Department at RSNA Headquarters in Oak Brook, Ill. The Eyler Fellow will work with the *RadioGraphics* editorial team at RSNA 2015.

The application deadline for the Olmsted fellowship is April 1. The Eyler fellowship application deadline is May 1. Learn more at [RSNA.org/RSNA\\_Editorial\\_Fellowships.aspx](http://RSNA.org/RSNA_Editorial_Fellowships.aspx).

**Radiology**  
**RadioGraphics**

## Numbers in the News

# 83

Percentage of dose reduction afforded to interventionalists and assistants by the thinnest version of the No Brainer® cranial radiation protection surgical cap. Research presented at RSNA 2014 indicated that the thickest versions of the cap can yield 100 percent reduction in dose. [Read more on Page 11.](#)

# 1,800

Pledges to RSNA's Radiology Cares®: The Art of Patient Centered Practice campaign by the close of RSNA 2014. Learn more about the campaign and see RSNA's new Caring Quilt ([See next page](#)), featuring messages from patients, at [RadiologyCares.org](http://RadiologyCares.org).

# 62,000

Approximate number of downloads of *Radiology* podcasts in 2014. Editor Herbert Y. Kressel, M.D., deputy editors and authors discuss select articles from each month's issue of the journal. Turn to [Page 18](#) to learn about the currently featured podcasts and access them all at [RSNA.org/Radiology-Podcasts](http://RSNA.org/Radiology-Podcasts).

# 225,000

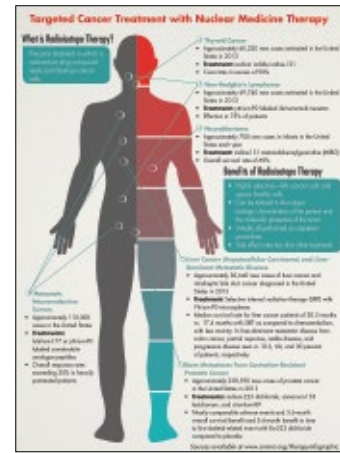
Area, in square miles, of the African nation of Kenya. A self-contained digital reading room, operated out of a truck at a rural clinic in Kenya by RSNA member Marc D. Kohli, M.D., exemplifies an international effort to increase informatics accessibility. [Read more on Page 7.](#)

# SNMMI INTRODUCES INFOGRAPHIC EXPLAINING NUCLEAR MEDICINE THERAPY

The Society of Nuclear Medicine and Molecular Imaging (SNMMI) recently released a new infographic showing how certain types of cancer can be treated using nuclear medicine therapy. Targeted Cancer Treatment with Nuclear Medicine Therapy is a visual guide to radioisotope therapy, a personalized treatment where a radioactive drug compound seeks and destroys cancer cells.

The infographic highlights the types of cancer that can be treated with targeted radioisotope therapy, including thyroid, liver, prostate, neuroblastoma, non-Hodgkin's lymphoma and metastatic neuroendocrine tumors. It breaks down the specific radioisotope treatment for each area and its effectiveness in patients.

Radioisotope therapy is a precision treatment that is highly selective—killing cancer cells while minimizing damage to healthy cells—and can be tailored to the unique molecular properties of the tumor. Virtually all radioisotope therapies are performed as outpatient procedures, and side effect rates are typically less than those of less focused treatments.



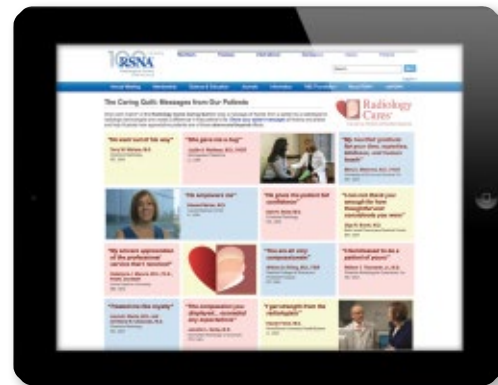
## Roentgen Nominations Being Accepted

Nominations are being accepted now for the RSNA Roentgen Resident/Fellow Research Award,

recognizing residents and fellows who have made significant contributions to their departments' research efforts as evidenced by presentations and publications of scientific papers, receipt of research grants or other contributions.

Only one resident or fellow per program can be nominated by the program director or department chair.

The RSNA Research & Education (R&E) Foundation provides an award plaque for 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](http://RSNA.org/Roentgen_Research_Award.aspx).



## RSNA's "Caring Quilt" Displays Patchwork of Patients' Gratitude

Radiologists frequently receive messages of thanks and praise from their patients. But until recently, there have been few opportunities to publicly share those messages to help inspire colleagues to practice patient-centered radiology.

With the introduction of RSNA's Caring Quilt: Messages from Our Patients, radiologists and radiologic technologists can now share those messages of gratitude from their patients online at [RSNA.org/The-Caring-Quilt](http://RSNA.org/The-Caring-Quilt).

Unveiled during RSNA 2014 as part of the Radiology Cares® campaign to optimize the patient experience in radiology, the first-of-its-kind "e-quilt" comprises a series of "patches" that each represent a message of thanks and praise from patients to radiologists and technologists. The quilt helps illustrate just how much patients appreciate the above-and-beyond efforts stemming from a patient-centered care approach.

Imaging professionals are encouraged to submit their own messages they've received from patients or to submit something on behalf of a colleague or institution via the online form at [RSNA.org/The-Caring-Quilt](http://RSNA.org/The-Caring-Quilt).

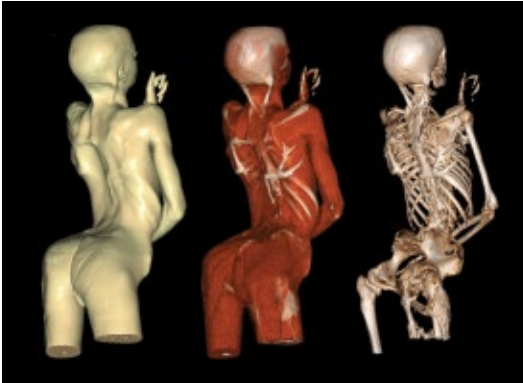
The Radiology Cares ([RadiologyCares.org](http://RadiologyCares.org)) campaign was launched in 2012 to provide radiology professionals with tools and information to help take patient-centered radiology from concept to practice.

## Centennial Image Contest Winners

Medical images are the lifeblood of radiology. To highlight that point during RSNA's Centennial celebration, the RSNA community was invited to enter the RSNA Centennial Image Contest, submitting entries in three categories: Radiology Art, Most Unusual Case and Best Medical Image.

Winning images were featured in a gallery in the Centennial Showcase at RSNA 2014.

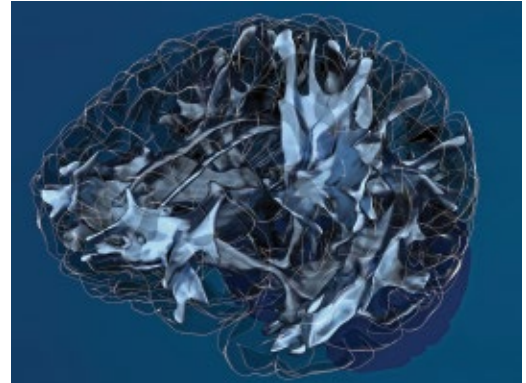
The winning images are:



### *Most Unusual Case*

**"STONE MAN SYNDROME"**  
BY ANDREI PURYSKO, M.D.

This image illustrates a patient with fibrodysplasia ossificans progressiva (FOP), a rare autosomal dominant genetic disorder and the most disabling condition of heterotopic (extraskelletal) ossification in humans. FOP was first described in 1692 by the French doctor Guy Patin and to date only 800 cases have been confirmed worldwide.



### *Best Medical Image*

**"THE HIDDEN WIRING OF OUR BRAIN"**  
BY MARIUS DE GROOT, PH.D.

The brain of a 72-year old man, scanned as part of the Rotterdam Study investigating patterns of change with aging and neurodegeneration across different tract categories.



### *Radiology Art*

**"FRAILEJONES MORADOS" BY JAVIER COMAS**

This artwork is created with radiographs subjected to computer processing, resulting in a unique form of expression. Radiographs: Fingers (the petals), arthroscopic meniscus (mountains) and angiography (stems and branches). For more information, go to [www.javiercomas.es](http://www.javiercomas.es).

ALL IMAGES SUBMITTED FOR THE CONTEST CAN BE VIEWED AT [RSNA.ORG/CENTENNIAL](http://RSNA.ORG/CENTENNIAL).





RSNA thanks our 2014 Corporate Partners who are helping to keep radiology at the forefront of science and technology.

GOLD



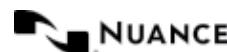
SILVER



BRONZE



GE Healthcare



THIS MONTH IN THE RSNA NEWS ONLINE VERSION

Get more of this month's news online at [RSNA.org/News](http://RSNA.org/News). Enjoy interactive features including video, audio, slide presentations and more. Go online to leave us a comment and easily share stories via social media as well.

View online versions of the Centennial Image Contest winners pictured on this month's cover, along with an RSNA 2014 video interview with Ruediger E. Scherthaner, M.D., and colleagues, discussing a new imaging platform that reduces radiation exposure in liver cancer patients.



RSNA NEWS

February 2015 • Volume 25, Number 2  
Published monthly by the Radiological Society of North America, Inc.  
820 Jorie Blvd., Oak Brook, IL 60523-2251. Printed in the USA.

POSTMASTER: Send address correction "changes" to: RSNA News, 820 Jorie Blvd., Oak Brook, IL 60523-2251  
Non-member subscription rate is \$20 per year; \$10 of active members' dues is allocated to a subscription of RSNA News.

Contents of *RSNA News* copyrighted ©2015, RSNA. RSNA is a registered trademark of the Radiological Society of North America, Inc.

LETTERS TO THE EDITOR

[rsnanews@rsna.org](mailto:rsnanews@rsna.org)  
1-630-571-7837 fax

SUBSCRIPTIONS  
[subscribe@rsna.org](mailto:subscribe@rsna.org)  
1-888-600-0064  
1-630-590-7770

REPRINTS AND PERMISSIONS

[permissions@rsna.org](mailto:permissions@rsna.org)  
1-630-571-7829  
1-630-590-7724 fax

ADVERTISING

[jkapicak@rsna.org](mailto:jkapicak@rsna.org)  
Judy Kapicak,  
Assistant Director  
1-630-571-7818



# Experts Debate Options for Head and Neck Imaging

BY RICHARD S. DARGAN

*Experience and expertise are key when weighing decisions about imaging the structures of the head and neck, according to head and neck imaging experts at RSNA 2014 who discussed and debated available imaging options for three clinical scenarios: parathyroid surgery, cancer surveillance and hearing loss in one ear due to a suspected tumor.*

THE FIRST SCENARIO involved localization of the parathyroid tissue for minimally invasive parathyroid surgery (MIPS). At one time, surgeons opened up and explored the neck to localize the often-difficult-to-find glands, but improvements in surgical technique and imaging technology have enabled a more focused approach—important considering that in most people with hyperparathyroidism only one gland of the four is diseased.

With the help of 4DCT, surgeons can access the parathyroid through a tiny incision and remove a single lesion, said C. Douglas Phillips, M.D., of Weill-Cornell Imaging at New York-Presbyterian Hospital in New York City. The exam can be learned quickly, is easily interpretable and offers a volumetric study, which is very important when imaging parathyroid disease, he said.

“You need to have every millimeter of the parathyroid evaluated,” Dr. Phillips said. “The problem with ultrasound and nuclear medicine is that you may not see every lesion.”

Dose reduction measures from manufacturers have helped mitigate the concern over radiation exposure from CT, Dr. Phillips added. “Our dose for a three-phase exam today is lower than the dose we previously had for a single-phase CT exam,” he said. Laurie A. Loevner, M.D., from the University of Pennsylvania Medical Center in Philadelphia, argued against the use of 4DCT. Surgery has become much easier for patients, she said, with shorter operating times and no general anesthesia requirement. “The take-home message is that we have a 95 percent success rate without any imaging, and only a minority of cases requires any imaging other than sestamibi and ultrasound,” she said.

## PET/CT Valuable for Surveillance of Squamous Cell Carcinoma

There was considerably less controversy in the second segment of the session, as presenters Barton F. Branstetter, M.D., from the University of Pittsburgh Medical Center, and Hugh D. Curtin, M.D., of Massachusetts Eye and Ear in Boston, largely agreed on the value of PET/CT for sur-

veillance of treated head and neck squamous cell carcinoma. PET/CT detects cancer recurrence sooner than other methods and is cost-effective in part because it prevents unnecessary surgery, Dr. Branstetter said.

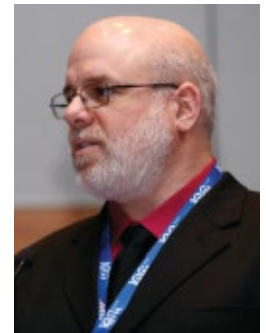
Expense, availability and patient tolerance are the chief problems with PET, Dr. Curtin said. The leading alternatives are CT with contrast and MRI with contrast, he said. He described how his institution stratifies patients into different risk categories, and those at medium risk for recurrence undergo PET/CT.

The final segment of the session focused on the use of gadolinium-based contrast agent in MRI of the internal auditory canal (IAC) for suspected vestibular schwannoma, a benign tumor of the nerve that conducts hearing and balance information from the inner ear to the brain. MRI with contrast is considered the best imaging option, but gadolinium has been associated with side effects in patients with compromised kidney function. A T2-weighted approach is now available that enables visualization of the nerve without contrast.

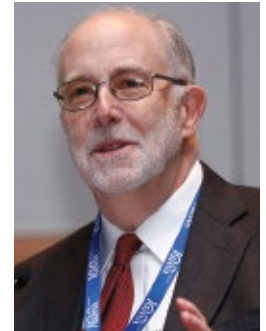
William P. Dillon, M.D., of the University of California in San Francisco, said the non-contrast approach requires experience and a “good eye,” as it can miss lesions outside of the IAC and has a high potential for false-negative findings. “In some cases you can’t identify a very tiny tumor or other pathology without contrast,” he said. “If I want a quick, definitive answer and I don’t want to have to bring people back for additional imaging, I’m going to use contrast.”

In addition to the gadolinium exposure, added time and expense are drawbacks of contrast-enhanced MRI, said Franz J. Wippold II, M.D., from Washington University School of Medicine in St. Louis. The T2-weighted approach takes only 4.5 minutes—compared to 25 for a limited gadolinium-enhanced scan—and improvements in the approach have reduced the rate of false-negative findings. In addition, the T2-weighted MRI eliminates “the small but real chance of adverse effects from contrast,” he said. □

RICHARD S. DARGAN is writer based in Albuquerque, N.M., specializing in healthcare issues.



Branstetter



Curtin



Dillon

Daily Bulletin coverage of RSNA 2014 is available at [RSNA.org/bulletin](http://RSNA.org/bulletin).



# The Experts Ask: Is DTI for Mild Traumatic Brain Injury Ready for Prime Time?

BY MIKE BASSETT

**Head injury, particularly mild traumatic brain injury (TBI), has always been a challenge to accurately assess with conventional neuroimaging. The use of diffusion MRI, or diffusion tensor imaging (DTI), has become a promising technique for diagnosing and treating traumatic brain injury.**

THE TECHNIQUE has also been a source of contention—both in the clinic and in the courtroom, according to researchers who addressed the question, “Is DTI ready for prime time?” during an RSNA 2014 Controversy session.

Not yet, according to presenters Pratik Mukherjee, M.D., Ph.D., a professor of radiology and bioengineering at the University of California, San Francisco, and Michael Lipton, M.D., Ph.D., associate director of the Gruss Magnetic Resonance Research Center at the Albert Einstein College of Medicine and medical director of MRI at Montefiore Medical Center in New York City.

Dr. Mukherjee said that one point of controversy surrounding the use of DTI centers on the question, “Is this really helpful on an individual patient basis as far as being able to diagnose a mild TBI concussion and say something useful about how a patient will progress afterwards?”

“And this really hasn’t been validated yet in multi-center trials that are designed to measure its specificity, sensitivity and utility of predicting outcomes in patient—all of the things you would want in a scientific test,” Dr. Mukherjee said.

What was called DTI almost 20 years ago is much different than DTI now, said Dr. Mukherjee. “It is far superior in terms of image quality and

Daily Bulletin coverage of RSNA 2014 is available at [RSNA.org/bulletin](http://RSNA.org/bulletin).

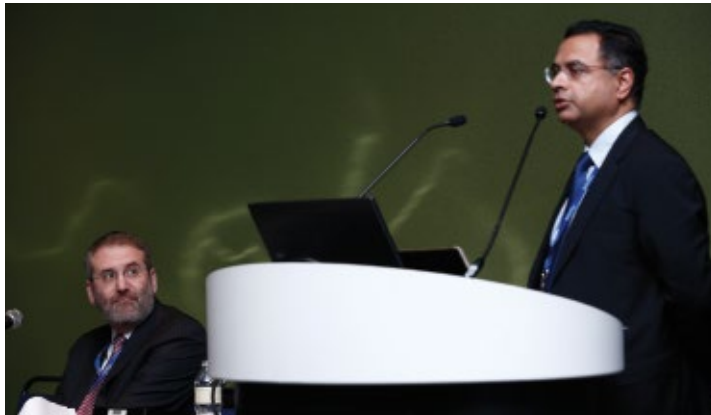
measurement precision, and in many other ways that are helpful for diagnosis. I’m optimistic long term that something good is going to come out of this, but right now people are treating this like it’s a done deal, and it’s not.”

He said he is currently conducting the imaging for a multi-center study “and one of the biomarkers we are looking at is DTI.” He hopes the study will give researchers more information about how DTI can be standardized across different U.S. centers so that it can be compared to a normative population in order to get reliable results with good specificity and sensitivity for diagnosis and outcome prediction.

## Is DTI Being Fairly Assessed?

Turning the question around, Dr. Lipton asked, “Are radiologists ready for DTI?”

For one thing, he pointed out, DTI requires radiologists to “deal with things like data quality,



**Michael Lipton, M.D., Ph.D., (left) and Pratik Mukherjee, M.D., Ph.D., debated the use of diffusion tensor MRI in diagnosing and treating traumatic brain injury during an RSNA 2014 Controversy Session.**

data consistency, analysis and even interpretation at a quantitative level, which is very different from the way most radiologists are trained.”

DTI is being held to an uncommonly high standard and is being assessed in a way that other imaging techniques haven’t been, Dr. Lipton added. “But what I think is important in terms of critically assessing the utility of DTI, is that other things we basically take for granted and do all the time in terms of relying on imaging findings are supported by much, much less evidence.”

Dr. Lipton referred to a study that he said demonstrates that more than 70 percent of what radiologists do in the reading room has no evidence behind it. “Does that mean it’s not valid, or that it’s not useful?” he asked. “No, it means that the evidence doesn’t exist and is based on opinion and experience.”

“The bottom line is that there is quite a lot of evidence supporting the use of DTI in detecting abnormalities in the brain,” Dr. Lipton continued.

As for the use of DTI in the courtroom, Dr. Mukherjee said that one of the problems facing DTI is that it has been “tainted” by its use in the courtroom.

Dr. Lipton agreed that imaging continues to be used improperly in the courtroom. “I think that DTI and quantitative imaging and quantitative diagnostics in general—because there are other things outside of imaging that have a similar challenge—is an approach that really raises the stakes because it is revealing an injury that we know is there, but we haven’t had a way to really put a finger on it.” □

**MIKE BASSETT** is a writer based in Holliston, Mass., specializing in health and medicine.

# Digital Mobile X-ray Truck Brings Imaging to Rural Kenya

BY BETH BURMAHL

In Kenya, where there are fewer than 200 radiologists to serve 43 million people, the prospect of getting an X-ray may seem slim for most residents, especially those living in rural parts of the east African country.

X-RAY EQUIPMENT is scarce and facilities that do have the technology are in bigger cities like Nairobi, leaving residents in far-flung areas with few options for getting radiographs. Public transportation—usually tiny, crowded buses—takes an entire day and can create financial hardships for residents who often can't afford to miss a day's work. The need for follow-up exams creates additional challenges.

While no solution would offer a quick-fix, in 2010, one radiologist had an idea to make critical inroads in not only reaching that underserved segment of the population, but also connecting their healthcare files from a central site to clinics in outlying parts of the country.

In just three years, Marc Kohli, M.D., a radiologist at the Indiana University School of Medicine, Indianapolis, saw his idea realized. Leading a small team of volunteers in October 2014, Dr. Kohli built a mobile X-ray truck equipped with a digital CR reader and an X-ray generator to the rural village of Moi's Bridge, where more than 50 patients received chest X-rays in one day. The team focused on TB and other pulmonary infections prevalent in HIV-positive patients in Kenya, which has one of the largest HIV epidemics in the world.

"In Africa, chest X-ray is critical to detecting TB, which is critical to successful HIV-AIDS therapy," Dr. Kohli said. "Even though this is just plain radiography, simple X-ray machines and X-ray film processors don't exist in many parts of Kenya."

In addition to acquiring the images digitally, Dr. Kohli used his informatics expertise to install open-source PACS for long-term archiving at a central location.

Dr. Kohli, a member of the RSNA Radiology Informatics Committee (RIC), developed a Web-based reporting tool used by Kenyan radiologists to report radiographs taken on the truck to outlying clinics connected to a server at a central site. That informatics tie-in is just one element that makes the mobile X-ray truck a model template for the



Along with manning the digital X-ray truck during frequent excursions to Kenya, David Avrin, M.D., Ph.D., (left) and Marc Kohli, M.D., devote much of their time to teaching radiology residents through the Moi University Radiology Registrars = Residents program, Moi Teaching and Referral Hospital, Kenya.

future, said David Avrin, M.D., Ph.D., professor of clinical radiology at the University of California, San Francisco, who also serves on the mobile X-ray volunteer team.

"I saw this project in action, and it's really a remarkable outreach effort that combines technology, general radiology, informatics expertise and Marc's energy and enthusiasm," said Dr. Avrin, an informatics expert who serves on the Integrating the Healthcare Enterprise (IHE®) RSNA subcommittee. "Essentially, this is a great example of where DICOM meets the Third World."

## X-ray Truck Faces Engineering Challenges

The origins of the mobile X-ray truck project can be traced to a 1997 partnership between IUSM and Kenya's two teaching hospitals, Moi University School of Medicine and Moi Teaching and Referral Hospital in Eldoret. Both are part of AMPATH, the Academic Model Providing Access to Healthcare, a consortium devoted to treating Kenyans with HIV and AIDS.

In 2003, the IUSM Radiology Department began participating in bi-directional exchanges with those Kenya institutions, educating faculty and residents with the goal of eventually educating a new generation of technologists and radiologists.

As an extension of that partnership, Dr. Kohli—who had visited Kenya as an IUSM radiology resident—launched the mobile X-ray truck project in 2010 with funds for the X-ray equipment provided by the National Library of Medicine.

From the beginning, the project was fraught with challenges—primarily involving the truck itself, which was funded by AMPATH. "Other projects prior to ours used really big trucks with multiple



## WEB EXTRAS

☑ To view a video of Dr. Kohli demonstrating the setup of the mobile X-ray truck, go to [RSNA.org/News](http://RSNA.org/News).

☑ For more information on AMPATH (the Academic Model Providing Access to Healthcare), go to [Ampathkenya.org](http://Ampathkenya.org).

rooms and large generators,” Dr. Kohli said. “Our project is on a smaller scale, which is more cost-effective—but that has created engineering challenges.”

The body of the truck was designed in collaboration with engineer Patrick O’Meara, an American living in Kenya with his wife and AMPATH researcher Wendy O’Meara. Patrick was able to completely enclose the generator inside the vehicle and secure the X-ray equipment to the truck. But relying on one generator created obstacles, Dr. Avrin said. “The X-ray machine needs a big burst of energy, and that would bring down the generator in the truck, causing the CR reader to fail ... we restarted it every time we did a scan. We had a lot of issues with circuit breakers.”

After nearly three years of preparation, the truck was ready for a trial run in September 2013. “We had had three really good pilot days and decided we were ready for a trip in October 2013,” Dr. Kohli said.

The team—a truck driver, radiographer and a radiologist—coordinate with clinics ahead of time to ensure patients know they are arriving. Along with Drs. Kohli and Avrin, Raym Geis, M.D., an assistant clinical professor of radiology at the University of Colorado School of Medicine, a member of the RSNA RIC Committee, and chair of the American College of Radiology IT Informatics Commission, serve on the volunteer team, along with a Kenyan radiologist/informatics specialist. Another supporter of the project, Valerie P. Jackson, M.D., Liaison for Education for the RSNA Board of Directors and former chair of the IU Radiology Department, has also visited Kenya with the team.

On a typical day in the field, patients range from people dying of AIDS to those seeking a follow-up for TB to children with acute pneumonia.

At the end of the day, all images are loaded onto a CD and transported to PACS-ready clinics for access by radiology staff. Those outlying clinics are connected to a central server at Moi University School of Medicine.

“The hospital can then upload the images into the patient’s electronic medical record from the system I helped build,” Dr. Kohli said.

No matter the patients’ reasons for visiting, Drs. Kohli and Avrin say they all shared a common response: gratitude.

“Patients were really excited to have access to X-rays and they were incredibly grateful and happy that they didn’t have to travel all day to get them,” Dr. Kohli said.

“The patients were extremely appreciative,” Dr. Avrin said. “These are basics we take for granted in the U.S., but even basic radiographs are high-tech in countries like Kenya.”

## A Prototype for the Future

The team, which had made numerous field trips since its first excursion, continues to gain momentum. Dr. Kohli was in Kenya in January 2015 and is already focused on workflow improvements, including developing an algorithm that would screen X-rays and provide clinical support onsite from the truck. Capability for transmitting X-rays via broadband Internet is also a future goal.



**The specially designed mobile X-ray truck reaches patients in underserved areas of Kenya. Top, from left: Peter Otunga, chief of radiography for AMPATH, and radiologist Marc Kohli, M.D., inside the truck; bottom: Dr. Kohli surveys the truck before patients begin arriving. “Patients were really excited to have access to X-rays,” Dr. Kohli said.**

In hopes that the prototype will expand to other developing countries, Dr. Kohli is undertaking a detailed analysis of the project that will eventually be available to other institutions.

“This is all part of our roadmap, but we’re really just getting started,” he said.

Because education is another critical component of their outreach, Drs. Kohli, Avrin and Geis devote much of their time to teaching through the Moi University Radiology Registrars = Residents program.

Dr. Kohli said the project has been the most rewarding—and important—experience of his radiology career. “One of the reasons I stayed on at IU as an academic radiologist is because I knew it would allow me to do this work that I feel is so important,” he said. “This opportunity has shaped my career.”

Calling it “the most remarkable experience” of his career, Dr. Avrin said he would “go back in a heartbeat.” He added that he also came away with a true appreciation for Dr. Kohli’s amazing foresight in conceptualizing this groundbreaking project.

“When we are sitting in meetings talking about health information technology, we never thought about deploying it to the third world, but Marc did,” Dr. Avrin said. “It’s a truly visionary project.” □

**BETH BURMAHL** is the Managing Editor of *RSNA News*.

---

*“This is a great example of where DICOM meets the Third World.”*

DAVID AVRIN, M.D., PH.D.



# Diffusion-weighted MR of the Cervix Aids in Managing Preterm Labor

BY MARY HENDERSON

**Diffusion-weighted MR (DWMR) imaging of the uterine cervix can predict impending preterm delivery in asymptomatic patients with premature shortening of the cervix, according to research presented at RSNA 2014.**

THE CERVIX is normally between 35 and 48 mm in length at 24 weeks gestation. A sonographic very short cervix (SCX) of less than 15 mm is a predictor of spontaneous preterm birth in late pregnancy.

“The clinical management of a sonographic short cervix in the mid-trimester of pregnancy is a major obstetrical challenge,” presenter Gabriele Masselli, M.D., explained. “Impending delivery is a severe condition that prompts admission to centers with neonatal intensive care units and an immediate administration of corticosteroids to induce fetal lung maturation. However, most patients with SCX will not deliver within one week.”

To better manage patients with symptoms of preterm labor, Dr. Masselli and a team of radiologists and gynecologists from Sapienza University of Rome investigated the use of MRI for cervical insufficiency. “To improve upon current methods of evaluating women for impending delivery, it is necessary to use parameters that are independent of cervical length and that reflect the process of fast cervical remodeling that occurs in the few days preceding labor,” he said.

*“High ADC intensity of the subglandular area of the cervix accurately predicted impending delivery within seven days in patients presenting with a very short cervix.”*

GABRIELE MASSELLI, M.D.

The prospective study included 30 pregnant women (mean age 29) with a mean gestational age of 24 weeks who were diagnosed with SCX of less than 15 mm and positive fetal fibronectin (FN). The researchers performed sagittal diffusion-weighted imaging studies and created an apparent diffusion coefficient (ADC) map targeted to the subglandular area of the uterine cervix for each patient and calculated ADC subglandular, ADC stromal and ADC subglandular-ADC stromal values.

Eight of the 30 patients (the impending delivery group) ultimately delivered within seven days of

admission to the hospital while 22 patients (late delivery group) delivered seven or more days after being hospitalized (mean of 32 days).

The ADC subglandular and ADC subglandular-ADC stromal values were significantly higher in patients within the impending delivery group than in the late delivery group. The ADCs of the cervical stroma did not help to differentiate the two groups.

## Subglandular ADC Accurately Predicts Impending Delivery

The researchers’ statistical analysis showed that subglandular ADC was an extremely accurate parameter for predicting impending delivery with an overall sensitivity of 95 percent and a specificity of 95 percent.

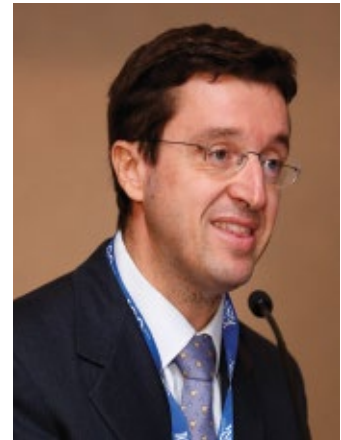
“High ADC intensity of the subglandular area of the cervix accurately predicted impending delivery within seven days in patients presenting with a very short cervix,” Dr. Masselli said.

Dr. Masselli also noted that high intensity subglandular ADC values were poorly correlated to cervical length, suggesting that they result from mechanisms independent from those involved

in cervical shortening. “When considering a diagnosis of impending preterm delivery, ADC maps targeted to the subglandular area of the uterine cervix greatly increase the positive predictive value of SCX and positive FN,” Dr. Masselli said.

Multicenter studies are needed to definitively assess the potential role of subglandular ADC as an imaging biomarker and to provide cost/benefit analyses, Dr. Masselli said. “We think the additional costs related to the MRI studies may be counterbalanced by a change in hospital admission policies for these patients who are typically hospitalized until delivery,” he said. □

MARY HENDERSON is a writer based in Bloomington, Ind., specializing in health and medicine.



Masselli

Daily Bulletin coverage of RSNA 2014 is available at [RSNA.org/bulletin](http://RSNA.org/bulletin).

# 3-T MRI is Imaging Standard for Detecting Cerebellar Hemorrhages in Preterm Infants

BY PAUL LATOUR

*3-T MR imaging detects a high prevalence of cerebellar hemorrhages (CbH) in preterm infants—a finding that could carry long-range implications regarding cognitive and motor function, according to research presented at RSNA 2014.*

IN ADDITION, a standardized scoring system can be applied to assist in grading of overall brain injury and prediction of neurodevelopmental outcomes, said Mai-Lan Ho, M.D., clinical instructor/chief fellow in neuroradiology and soon-to-be assistant professor of pediatric neuroradiology at the University of California, San Francisco (UCSF). “It’s very exciting because 25 years ago, people thought that the cerebellum only modulated motor coordination and balance,” said Dr. Ho, who was the 2012 RSNA William W. Olmsted Editorial Fellow and received a 2012 Roentgen Resident/Fellow Research Award from the RSNA Research & Education (R&E) Foundation and the 2012 Bracco Diagnostics/RSNA Research Resident Grant.

Daily Bulletin coverage of RSNA 2014 is available at [RSNA.org/bulletin](http://RSNA.org/bulletin).

“Several papers report cognitive and psychiatric deficits in patients with congenital or acquired cerebellar lesions,” Dr. Ho said.

“That’s important for our studies because cerebellar injury in preterm infants may help explain their long-term cognitive impairment.”

Detection of CbH in preterm infants has steadily increased with the introduction of new imaging modalities, said the study’s senior author, A. James Barkovich, M.D., professor in residence and chief of pediatric neuroradiology at UCSF. CbH was thought to occur in about 10 percent of preterm infants when 1.5-T MRI was used; however, the proportion jumped to more than 20 percent when 3-T MRI was used, and surpassed 30 percent with the use of susceptibility-weighted imaging at 3T.

The study is ongoing, but in their most recent analysis, the researchers identified 22 of 59 (37 percent) infants with CbH, a proportion approaching the reported prevalence of cognitive impairment in the preterm birth population.

“When you start getting into 35 or 40 percent [with CbH], and you realize 50 percent [of preterm infants] have developmental problems, this is a significant finding,” said Dr. Barkovich, the 2012 RSNA Outstanding Researcher. “Maybe this is why we haven’t been able to get the neurodevelopmental levels up to normal in 90 or 95 percent like we have with motor function.”

Based on Fisher’s exact test, the researchers’ cohort showed that CbH is statistically associated with intraventricular hemorrhage (IVH), but not with white matter injury (WMI) or ventriculomegaly (VM). Furthermore, they found that at 1 year of age, CbH is associated with cognitive and motor subscores on the



Dr. Ho with her RSNA 2014 research.

Bayley-III Scales of Infant and Toddler Development.

“A big question has been, ‘Can we use imaging to evaluate preterm risk factors associated with neurodevelopmental outcomes?’” Dr. Ho said. “If so, could we identify these patients early and institute earlier preventive or therapeutic measures? It’s an exciting concept.”

The high volume of admissions to the neonatal intensive care unit (NICU) at UCSF make it one of the few centers worldwide

*“A big question has been, ‘Can we use imaging to evaluate preterm risk factors associated with neurodevelopmental outcomes?’”*

MAI-LAN HO, M.D.

able to investigate CbH in great detail. The group is among the first to focus on cerebellar in addition to cerebral injury.

“The human cerebellum represents 10 percent of intracranial volume, but contains 80 percent of total neurons in the brain,” Dr. Ho said. “Fascinatingly, the ratio of neurons between the cerebellum and cerebrum has been relatively preserved throughout evolution, which really does make a case for the cerebellum being a higher order executive center.” □

PAUL LATOUR is an RSNA News staff writer.

# New Interventional Platform Reduces Radiation Exposure for Patients and Clinicians

BY RICHARD S. DARGAN

**A new imaging platform allows for significant X-ray radiation dose reduction without compromising image quality in patients undergoing intra-arterial therapy (IAT) for liver cancer, according to research presented at RSNA 2014.**

IN HEPATIC IAT, treatment is delivered under fluoroscopic guidance directly to liver tumors through the blood vessels that feed them. Local delivery of chemotherapeutic drugs allows for increased drug dose while achieving reduced side effects compared to intravenous, systemic delivery; however, the IAT procedure exposes both patients and interventional radiology staff to ionizing radiation. Increased use of hepatic IAT during the last

**Daily Bulletin coverage of RSNA 2014 is available at [RSNA.org/bulletin](http://RSNA.org/bulletin).**

decade has raised concerns over radiation exposure, especially given the fact that patients undergo repeat treatments.

Ruediger E. Scherthaner, M.D., from the Johns Hopkins Hospital in Baltimore, and colleagues investigated a new C-arm imaging platform that offers optimized parameters for IAT-associated image acquisitions like fluoroscopy, digital subtraction angiography (DSA) and cone beam computed tomography (CBCT).

The researchers tested the platform—the AlluraClarity from Philips Healthcare of Best, The Netherlands—on 52 patients and compared radiation exposure and image quality with results from 26 other patients who had undergone similar procedures on an older system. Radiation exposure, including air kerma (AK), the radiation exposure in free air before reaching the body, and dose area product (DAP), the absorbed radiation dose multiplied by the area irradiated, was recorded throughout the procedure.

The new system resulted in an exposure reduction in total AK and DAP of 58 percent and 60 percent, respectively, compared to the old platform. DAP for fluoroscopy, DSA and CBCT decreased by up to 66 percent, 79 percent and 14 percent, respectively. During the procedures, no relevant problems due to image quality were reported. Likewise, the blinded evaluation of image quality revealed no differences between the new and the old imaging platforms. Both patient cohorts showed no difference with regard to body mass



Scherthaner

index or fluoroscopy time.

“The main finding is that the radiation exposure for patients undergoing IAT can be significantly lowered, which is especially important for patients undergoing several procedures,” said Dr. Scherthaner. “In contrast to diagnostic imaging, the decreased radiation exposure not only affects the patient, but also the staff who are in the room performing the procedure because their lifetime cumulative dose can be lowered.”

## Applications Possible in Gynecologic, Pediatric Imaging

Dr. Scherthaner predicted that the new platform would have applications beyond IAT of the liver. “We are currently investigating the potential of this new platform for women with uterine fibroids treated with uterine artery embolization,” he said. “Some of these women are at a child-bearing age, where radiation exposure is of even greater concern. And the most important patient population with regards to radiation exposure are pediatric patients, who are the most sensitive group to radiation exposure, especially when considering the cumulative lifetime risks associated with X-ray exposure. This new platform is an essential step to minimizing this risk.” □

## WEB EXTRAS

View of video of Ruediger E. Scherthaner, M.D. discussing his RSNA 2014 research at [RSNA.org/News](http://RSNA.org/News).

*“Radiation exposure for patients undergoing IAT can be significantly lowered, which is especially important for patients undergoing several procedures.”*

RUEDIGER E. SCHERTHANER M.D.



# Surgical Cap Protects Staff Against Radiation

BY RICHARD S. DARGAN

*An inexpensive, disposable surgical cap effectively reduces radiation exposure to the brains of interventionalists and assistants, according to new research presented at RSNA 2014.*



Byers

RADIOLOGISTS AND TECHNOLOGISTS involved in interventional procedures are chronically exposed to ionizing radiation. Irradiation of the cranium, even at low doses, can increase the incidence of all cerebral neoplasms, including meningioma. A 2013 study identified 31 interventionalists who developed brain cancer and found that 85 percent of cases were left-sided tumors—the physician's left side is typically closer to the radiation source during interventional procedures.

Imgen, the Las Vegas-based research arm of the Nevada Imaging Centers, recently evaluated the radioprotective properties of the No Brainer®, a cranial radiation protection surgical cap manufactured by RADPAD of Kansas City. The disposable surgical caps are available in four levels of protection based on the thickness of the heavy metal shielding. At 0.375 millimeters, the Red level provides the thickest lead equivalent shield, while the Blue level's 0.07-millimeter-thick shield is the thinnest.

Researchers tested the cap on phantoms before studying them during actual fluoroscopic procedures. The caps were used to protect the craniums of one interventionalist and one assistant during 45 fluoroscopic procedures. Radiation monitoring during the fluoroscopic procedures was accomplished using real-time radiation detectors. Simultaneous monitor recordings were performed with radiation detectors positioned identically above and

Daily Bulletin coverage of RSNA 2014 is available at [RSNA.org/bulletin](http://RSNA.org/bulletin).

below the protective material at the level of the anterior left cranium above the left eye.

Dose reductions for the procedures ranged from 83 percent for the Blue level to 100 percent for the Red and Orange levels. "Both the phantom study and the actual procedures demonstrated statistically significant ionizing dose reductions to cranium when using the protective caps," said presenter Luke A. Byers, D.O. "Increased protection correlated with increasing thickness of radiation shielding material."

The interventionalist and the assistant reported that the surgical caps were minimally different from those typically worn for interventional procedures and there was no reported discomfort even after a full day of wear. "The study results show you can use disposable surgical caps in an interventional setting to significantly reduce or completely negate the amount of radiation that the cranium is exposed to," Dr. Byers said. "Hopefully, this device will stem the increasing number of interventionalists reported with cerebral malignancies."

The caps cost about \$5 each and can be used for multiple procedures before disposal, according to radiologist and study co-author William W. Orrison, M.D., M.B.A. The thinner, lighter caps are ideal for brief procedures, while the thicker ones would be recommended for longer interventions, Dr. Orrison said.

In the next phase of the research, the investigators plan to see if the caps can help reduce cranial dose to patients during interventional procedures. □

RICHARD S. DARGAN is a writer based in Albuquerque, N.M., specializing in healthcare issues.



In his RSNA 2014 research, Luke A. Byers, D.O., demonstrated the effectiveness of disposable surgical caps that are available in four levels of protection based on the thickness of the heavy metal shielding. Image courtesy of Dr. Byers

*"Both the phantom study and the actual procedures demonstrated statistically significant ionizing dose reductions to cranium when using the protective caps."*

LUKE A. BYERS, D.O.

# Radiomics Could Change Role of Radiologists

BY PAUL LATOUR

**In the future, radiologists won't simply be interpreters of imaging studies, they will be the curators of quantitative and descriptive data about disease processes that will enable computerized decision-support systems to improve diagnostic and prognostic accuracy, according to experts in the rapidly expanding field of radiomics.**

“RADIOMICS: FROM Clinical Images to Omics,” was the title of a symposium presented by RSNA and the American Association of Physicists in Medicine (AAPM) during RSNA 2014. Molecular biology has shaped how diseases are managed and how new oncology drugs and tests are developed, said Paul E. Kinahan, Ph.D., during his introductory speech at the symposium. But despite great promise from molecular biology, progress has been slow, said Dr. Kinahan, head of the Imaging Research Laboratory, Department of Radiology, at the University of Washington.

“We have had the entire human genome sequenced for over a decade and molecular biology has been leading us to targeted therapies,” Dr. Kinahan said. “But we still have a long way to go. We need guidance to develop and apply new therapies appropriately. We need guidance to develop and apply these new therapies appropriately.” Radiomics—the high-throughput extraction of large amounts of data from medical images—may be the catalyst we need, the speakers at the symposium suggested.

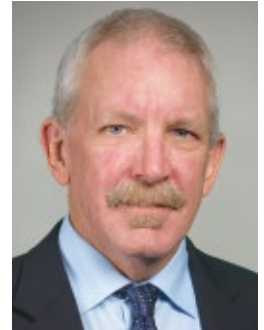
In his lecture, “The Radiology Reading Room of the Future,” Robert Gillies, Ph.D., said radiologists in the future will participate by identifying the volumes and areas of interest that can be segmented. From these volumes, computers can extract hundreds of descriptive quantitative features. These features can then be combined with medical and genomic data to create a comprehensive database, he said.

“The core belief of radiomics is that images aren't pictures—they're data. We have to treat them as data,” said Dr. Gillies, chair of the Department of Cancer Research and Metabolism at the H. Lee Moffitt Cancer Center & Research Institute in Tampa, Florida. “Right now we extract about 600 different quantitative features from any volume of interest.”

The motivating factor spurring radiomics is rooted in cancer genetics, Dr. Gillies said. Genetic heterogeneity of tumors, which arises from genome instability in combination with highly selective



Kinahan



Gillies



Hricak



Deasy

microenvironments, is a major cause of therapy resistance. Deep analysis of the images can quantify microenvironments and, he predicts, the extent of genetic heterogeneity.

“Quantitative features improve diagnostic accuracy and can be predictive. Prediction is important because that actually leads to actionable consequences,” Dr. Gillies said. “Can we predict epidermal growth factor receptor (EGFR) mutations? Can we predict hypoxia? If so, we have drugs that will treat those areas.”

## Making Precision Medicine a Reality

In her lecture, “Radiomics in Oncology: Pathway to Precision Medicine,” Hedvig Hricak, M.D., Ph.D., Dr. h.c., emphasized that in the era of molecular medicine, the traditional radiology-pathology cor-

*“The core belief of radiomics is that images aren't pictures—they're data. We have to treat them as data.”*

ROBERT GILLIES, PH.D.

relation paradigm alone is no longer sufficient. The use of in vivo, quantitative prognostic and predictive imaging biomarkers, such as those provided by radiomics analyses, will be essential to selecting the right patient for the right treatment at the right time, said Dr. Hricak, 2010 RSNA President and Chair of the Department of Radiology at Memorial Sloan Kettering Cancer Center (MSKCC) in New York City.

Quantitative imaging features that can be extracted through radiomics include textural features, functional parameters, and clusters of features from multiparametric imaging, Dr. Hricak said. Radiogenomic analyses define relationships – or association maps – between such imaging features and molecular markers (omics), thus establishing a connection between diagnostic imaging and molecular diagnostics, she said.

The radiogenomic features are not going to tell us exactly which gene mutation has occurred, Dr. Hricak noted. However, radiogenomics could help radiologists identify key prognostic imaging features, better understand tumor heterogeneity and guide molecularly-driven biopsies.

To move the field of radiomics forward in a safe and evidence-driven fashion, it is important to take lessons from other fields of big data analysis, such as omics, Dr. Hricak said, referencing the Institute of Medicine’s 2011 report, “The Evolution of Translational Omics.” “There has to be transparency in the discovery and test-validation phases and the evaluation of clinical utility,” she said.

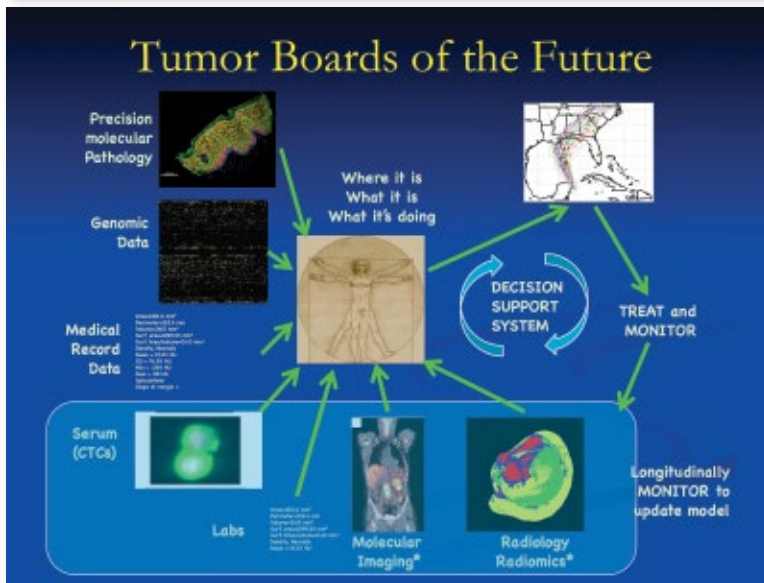
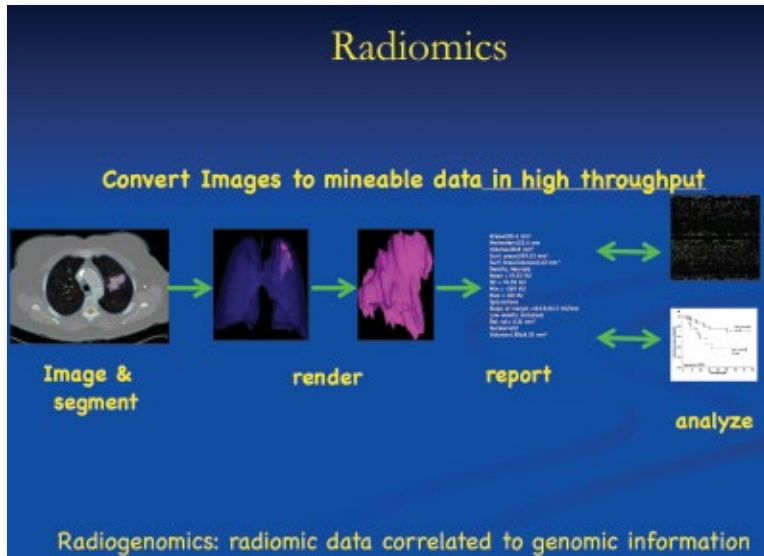
“To explore the full potential of radiomics, we have to enter the era of big data, team science and, most of all, the new age of imaging bioinformatics,” Dr. Hricak concluded.

**Data Tied to Predicting Outcome**

Joseph O. Deasy, Ph.D., was part of an early study at MSKCC that showed extracting data from images was likely to be predictive of outcome. More recently, Dr. Deasy was the senior author on “FDG-PET-Based Radiomics to Predict Local Control and Survival Following Radiotherapy,” presented at the AAPM annual meeting in July 2014.

In that study, researchers analyzed two cancer data sets, patients with non-small cell lung cancer and patients with stage III-IV head and neck cancer. Researchers found that the risk of metastases arising appeared to be related to the shape and the intensity variable within the shape of the tumor.

While more research is needed, Dr. Deasy said he hopes that



During his RSNA 2014 presentation, Robert J. Gillies, Ph.D., said the motivating factor spurring radiomics is rooted in cancer genetics. Dr. Gillies described a Tumor Board of the Future (above) in which medical imaging plays a significant role in analyzing tumor heterogeneity and response to therapy. – Images courtesy of Robert J. Gillies, Ph.D.

radiomics will prove helpful in at least two areas. “If the models become predictive enough, then potentially some patients could avoid systemic therapy—such as chemotherapy—due to a very low risk of metastatic disease,” he said. “We believe using the overall integral uptake intensity to help define the radiation dose needed could be useful to avoid overtreating some patients or undertreating others.” □

PAUL LaTOUR is an RSNA News staff writer.



# The Campaign for Funding Radiology's Future®



The RSNA Research & Education Foundation thanks the following donors for gifts made  
**October 25 – November 11, 2014.**

## Vanguard Program

Companies supporting endowments and term funding for named grants



LIFE FROM INSIDE

**Bracco Diagnostics, Inc.**  
\$60,000  
A founding Vanguard company since 1990.

## Visionaries in Practice

A giving program for private practices and academic departments

BRONZE (\$10,000)



**Radiology Ltd.**  
Tucson, AZ



**Southwest Diagnostic Imaging,**  
Phoenix, AZ



**St. Paul Radiology Foundation,**  
St. Paul, MN

## Visionary Donors

Individuals recognized for cumulative lifetime donations

**RUBY VISIONARY (\$100,000)**

Anne G. Osborn, M.D.

**GOLD VISIONARY (\$15,000)**

Vijay M. Rao, M.D. & A.K. Rao, M.D.

**SILVER VISIONARY (\$10,000)**

Shobha P. Desai, M.D. &

Paresh B. Desai, M.D.

Maxine & Paul H. Ellenbogen, M.D.

Julietta & Adolfo Escobar-Prieto, M.D.

**BRONZE VISIONARY (\$5,000)**

Mark O. Bernardy, M.D.

Jeno I. Sebes, M.D.

David E. Magarik, M.D.

**\$500 - \$1,499**

Shigeru Ehara, M.D.

Amanda J. Ferrell, M.D. & E.W. Swan

Paul J. Friedman, M.D.

David E. Magarik, M.D.

Martha B. Mainiero, M.D.

**Sherry &**

**Michael M. Raskin, M.D., J.D., M.B.A.**

Anne G. & Walter L. Robb, Ph.D.

Heather &

Christopher J. Schaeffer, M.D., Ph.D.

**Dean A. Genth &**

**Gary W. Swenson, M.D.**

**Richard D. White, M.D.**

**\$300 - \$499**

Anonymous

Nesreen Abouokbah, M.D. &

Osama Abou-Mansoor

Manal M. Aboustat, Ph.D., M.Sc.

Ronald S. Adler, M.D., Ph.D.

Atiye N. & Recai Aktay, M.D.

Judith K. Amorosa, M.D. &

Louis F. Amorosa, M.D.

Beatriz & Francisco A. Arredondo, M.D.

Christian Arseneau, M.D.

Sriharsha Athreya, F.R.C.R., M.B.B.S.

Frits H. Barneveld Binkhuysen, M.D.

Eric S. Bartlett, M.D., M.P.H.

Gayle & Harold F. Bennett, M.D., Ph.D.

Kalpna & Shailesh M. Bhatt, M.D.

Russell D. Blumer, M.D.

Gunilla & Hugo G. Bogren, M.D., Ph.D.

Jaime Bonilla, M.D.

Stuart E. Braverman, M.D.

David S. Buck, M.D.

Sharm El' Buras, M.D.

Enrique M. Bursztyn, M.D.

Oliver R. Byass, F.R.C.R.

Lucia Carpineta, M.D. & Michael Gaul

Liang Kuang Chen, M.D.

Taylor Chung, M.D.

Graciela Bethencourt &

Ovidio Colon, M.D.

Durval C. Costa, M.D., Ph.D.

Luis F. Costa, M.D.

Aisha Ansari & Andrew M. Crean, M.D.

Joan C. & Jerry R. Croteau, M.D.

**Horacio R. D'Agostino, M.D., F.I.C.S.**

Gerard J. Den Heeten, M.D., Ph.D.

Anne S. & Garth R. Drewry, M.D.

Alexander Drzezga, M.D.

Peter R. Eby, M.D.

Melissa & Robert R. Edelman, M.D.

Mona M. El Khoury, M.D.

Julietta & Adolfo Escobar-Prieto, M.D.

Sami M. Fakir, M.D.

Marcial Q. Favila, M.D.

Martin Garcia, M.D.

Roland E. Gazaille III, D.O.

Daghdild Dencker &

Jonh-Terje Geitung, M.D.

Dianne Georgian-Smith, M.D. &

Gordon Smith

Iris C. Gibbs, M.D.

Aprile B. Gibson, M.D. &

Theopluis Gibson

Susan B. Giesecke

Elynn T. & Bruce C. Gilbert, M.D.

Julian P. Goh, M.D.

Sidney I. Green, M.D.

Stuart M. Grieve, M.B.B.S., D.Phil.

Wan-Yuo Guo, M.D.

Susan & Adam R. Guttentag, M.D.

Elizabeth L. Hadley, M.D.

Barbara & Wayne D. Harrison, M.D.

Tamara M. Haygood, M.D., Ph.D.

Adelino & Herminia Henriques, M.D.

Sally D. Herschorn, M.D.

Mauricio H. Hertz, M.D.

Gloria L. Hwang, M.D. &

Steven W. Hetts, M.D.

Muriel & Harold O. Horsfall, M.B.B.S.

Tae Iwasawa, M.D.

Jeffrey M. Jacobson, M.D.

Kimberley Jacques

Gail & Jeffrey G. Jarvik, M.D., M.P.H.

Pamela G. & James S. Jelinek, M.D.

Jeffrey K. Jenkin, M.D.

Susan D. John, M.D. & Darrell John

Daniel H. Johnson Jr., M.D.

Jacqueline & Paul D. Kamin, M.D.

Mel L. Kantor, D.D.S., M.P.H.

Dr. & Mrs. Barry H. Kart

C. Stephen Keklak, M.D.

Karolyn R. Kerr, M.D.

Judith & Howard Kessler, M.D.

John C. Kirby, D.O.

Rudolf J. Knapp, M.D.

## Individual Donors

Donors who give \$1,500 or more per year qualify for the RSNA Presidents Circle. Their names are shown in bold face.

**\$10,000 or more**

**T. Chen Fong, M.D., F.R.C.P.(C), F.A.C.R.**

Anne G. Osborn, M.D.

**\$5,000 - \$9,999**

Mark O. Bernardy, M.D.

Anton N. Hasso, M.D.

Vania L. & Tito L. Mundim, M.D.

**\$2,500 - \$4,999**

Shirley Baron, Ph.D. & Richard L.

Baron, M.D.

Claudia P. & Levon N. Nazarian, M.D.

**\$1,500 - \$2,499**

Eun-Kyung Lee &

Byung Ihn Choi, M.D., Ph.D.

Sandra W. Cohen, M.D. &

Harris L. Cohen, M.D.

Shobha P. Desai, M.D. &

Paresh B. Desai, M.D.

Betty & Robert J. Douglas, M.D.

Debbie & Richard Duszak Jr., M.D.

Maxine & Paul H. Ellenbogen, M.D.

Nancy Ellerbroek M.D.

*In memory of David H. Hussey, M.D.*

Christopher G. Filippi, M.D.

Reza Forghani, M.D., Ph.D.

**E. Robert Heitzman, M.D.**

**Dale & Walter Kucharczyk, M.D.**

**Heike E. Daldrup-Link, M.D., Ph.D. &**

**Thomas M. Link, M.D.**

**Arthur G. Livingstone Jr., M.D.**

**Douglas MacEwan, M.D.**

**Mary C. Mahoney, M.D.**

**Dr. James A. & Joan P. McGee**

**Martha M. Munden, M.D. &**

**Reginald F. Munden, M.D., D.M.D.**

**Vijay M. Rao, M.D. & A.K. Rao, M.D.**

**Carol A. Diamond, M.D. &**

**Howard A. Rowley, M.D.**

*In honor of Anne G. Osborn, M.D.*

**Sandra K. Fernbach, M.D., F.A.C.R. &**

**Eric J. Russell, M.D., F.A.C.R.**

Jeno I. Sebes, M.D.

*In memory of Bette Bondurant Sebes*

**Arlyne T. Shockman, M.D.**

**Susan & Stephen M. Smith, M.D.**

**Rebecca R. & Wilbur L. Smith Jr., M.D.**

**Sandralee &**

**William M. Thompson, M.D.**

**Pamela K. Woodard, M.D. &**

**Edward O'Donnell**

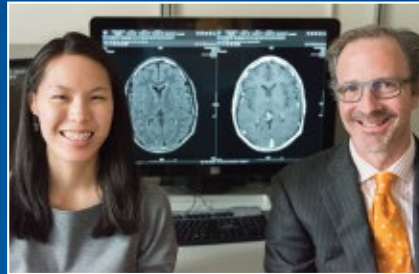
**Alaine & Brian C. Ying, M.B.B.S.**

**INSPIRE**

**YOUR DONATIONS IN ACTION**

*Quantitative Measurement of MS Pathology*

Hitachi Medical Systems/RSNA Research Resident Grant recipient **Jennifer Elaine Soun, M.D.**, with scientific advisor and past R&E grant recipient **Christopher G. Filippi, M.D.**, will investigate if T1rho, a novel quantitative advanced MR technique, can describe multiple sclerosis (MS) pathology beyond what is visualized on traditional MR sequences. It is expected that T1rho will serve as a noninvasive clinical biomarker to assess disease burden, thus informing diagnosis and management of MS patients.



**Jennifer Elaine Soun, M.D.**, (left) with scientific advisor **Christopher G. Filippi, M.D.**

Heidi Kolberg, M.D.  
Kazunori Kubota, M.D., Ph.D.  
Olga Kyritsi, M.D.  
Bradley G. Langer, M.D.  
Scott K. Lee, M.D., M.A.  
Thomas Lehnen, M.D.  
Michael L. Lester, M.D.  
Young J. & Hyo K. Lim, M.D.  
Edward P. Lin, M.D.  
Spencer Lister, M.D.  
Rong Luo & Jianping Lu, M.D.  
Steven P. Lukancic, M.D.  
Vinay D. Luthra, M.D.  
Kimberly J. Marlowe, M.D., Ph.D.  
Mylon W. Marshall, M.D.  
Nadine &  
Alistair S. Aubyn McBean, M.B.B.S.  
Charles H. McDonnell III, M.D.  
**Jose T. Medina, M.D.**  
Corinne Balleyguier, M.D. &  
Yves M. Menu, M.D.  
Patricia J. Mergo, M.D.  
John R. Mernagh, M.D.  
Lori W. & Christopher A. Meyer, M.D.  
Deborah & Donald G. Mitchell, M.D.  
Alexandre F. Morin, M.D.  
Timothy J. Mosher, M.D.  
Jonathan S. Movson, M.B.Ch.B.  
Fletcher M. Munter, M.D.  
Rendon C. Nelson  
*In honor of Carl E. Ravin, M.D.*  
Amy M. Neville, M.D. &  
Steven M. Townsend  
Paula Novelli, M.D. & Paul Lee  
Richard A. Ofstein, M.D.  
Darren P. O'Neill, M.D.  
Michelle & Richard R. Ozmun Jr., M.D.  
Syam P. Reddy II, M.D.  
Stella & Joe C. Rice, M.D.  
Susan G. Roux, M.D.  
Alesia P. Saboeiro, M.D. &  
Gregory R. Saboeiro, M.D.  
Claire K. Sandstrom, M.D.  
Jean M. Seely, M.D.  
Siddhi J. Shah, M.D.  
Hussain H. Sharahili, M.B.B.S., M.D.  
Nadeem Shrafat, M.B.B.S.  
Julie & Spencer Sinclair, M.D.  
Marcus V. Stelly, M.D.  
Robert L. Stubbs, M.D.  
An Tang, M.D.  
Gill M. Taylor-Tyree Sr., M.D.  
Graeme Thomas, M.D.  
Arkom Tivorsak, M.D.  
Kaori Togashi, M.D., Ph.D.  
Wen-Sheng Tzeng, M.D.  
Heidi R. Umphrey, M.D.  
Theodore F. Van Zandt, M.D.  
Flora & Carmo A. Vicentini, M.D.  
Athanassios Vlahos, M.D.  
Joshua A. Walsh, M.D.  
Gregory V. White, M.D.  
Paul R. White, M.D.  
Matthew C. Wiggins, M.D.  
Denise Connolly &  
Ronald L. Wolf, M.D., Ph.D.  
Beverly P. Wood, M.D., M.S.Ed., Ph.D. &  
Lawrence W. Wood, M.D.  
Gary L. Wood, M.D.  
Dennis A. Woolner, M.D.  
Cathleen A. Woomert, M.D.  
Thomas Y. Wu, M.D.  
Ching-Yih Yang, M.D.  
Wei T. Yang, M.D.  
Allison S. Yee, M.D.  
Greg Zaharchuk, M.D., Ph.D.  
Olga & Christoph L. Zollikofer, M.D.  
**\$299 or Less**  
Anonymous (3)  
Denise R. Aberle, M.D. & John S. Adams  
Rajendra Achaibar, M.D.  
Muhammad S. Ahmadu, M.B.B.S.  
Suzanne & Daniel C. Alder, M.D.  
Sindy & Mark D. Alson, M.D.  
Raquel Alves de Lima Arcaldi, M.D.

Olivier Ami, M.D., Ph.D.  
Kert F. Anzilotti Jr., M.D.  
Luke Augustine, Pharm.D.  
Donald T. Barnes, M.D.  
Veronique Barois De Stoop, M.D. &  
Miguel E. Stoop, M.D.  
Ailan H. Barrientos-Priego, M.D.  
Patricia A. Barry, M.D. &  
John Cosgrove, M.D.  
Steven C. Basinski, M.D.  
Michelle & Sean D. Beaty, M.D.  
Parviz Behfarin, M.D.  
Christopher Beirne, M.B.B.Ch., M.R.C.S.  
Svetlana & George M. Benashvili, M.D.  
Richard M. Benator, M.D.  
Grant Berges, M.D.  
Andrew K. Best, M.D.  
Tanushree Bhattacharjya, M.D. &  
Shantanu Bhattacharjya  
Barbara P. Biber, M.D. & Charles Rizzi  
Katherine R. Birchard, M.D.  
Jeffrey W. Birn, M.D.  
Andrew S. Blum, M.D.  
Jorge Boada Diaz  
**Martha & James Borgstede, M.D.**  
Simon D. Braun, M.D.  
Alistair Browne, B.S.C.  
Sarah & Alan D. Brydie, M.B.Ch.B.  
Marsha & Terry J. Buccambuso, M.D.  
John T. Burke, M.D.  
Hong Sik Byun, M.D.  
Fabian A. Cabrera-Florez, M.D.  
Francisco J. Calvario, M.D.  
**Nancy J. & Robert E. Campbell, M.D.**  
*In memory of William J. Tuddenham, M.D.*  
Dorine Joyal &  
Carl Chartrand-Lefebvre, M.D.  
Ju-ting Chen, M.D.  
Amrit Chopra, M.D.  
Eve D. Clark, M.D. & Ben Clark  
Yariv Cohen, M.D.  
Carol L. Collings, M.D. &  
Matthew G. Haney  
James R. Cormack, M.D.

Andrea S. Costa, M.D.  
Cinthia Cruz Romero, M.D.  
Anne M. Curtis, M.D. & James J. Fischer  
Huu-Ninh V. Dao, M.D.  
Cesar A. De Araujo Neto, M.D.  
Francesca & Eduard E. De Lange, M.D.  
Liten & Eric DeNaut  
Leisa W. & Michael F. DeVenny, M.D.  
Yvonne N. Fokkema &  
Cees Devries, M.D.  
Peter E. Doris, M.D.  
Jennifer & Eric A. Dovichi, M.D.  
Diane Hanley &  
Michael F. Dowe Jr., M.D.  
Joel A. Dunlap, M.D.  
Paul E. Dybbro, M.D.  
Kevin S. Early, M.D.  
Kirsten Ecklund, M.D.  
Adrian Estrada Campos, M.D.  
Eric P. Eutsler, M.D.  
Peter F. Faulhaber, M.D.  
Robert T. Fazio, M.D., Ph.D.  
Nicholas J. Ferris, M.B.B.S.  
**Christopher G. Filippi, M.D.**  
Maxine L. & Stephen N. Fisher, M.D.  
James B. Fitzgerald, M.D.  
Carl C. Flink, M.D.  
Linda Bertoletti, M.D. &  
Francesco Fraioli, M.D.  
Ute Freise, M.D.  
Therese & Irwin M. Freundlich, M.D.  
Hajime Fujimoto, M.D.  
Maria C. &  
Marcelo B. Funari, M.D.  
Teri J. Franks, M.D. &  
Jeffrey R. Galvin, M.D.  
Claudio Garcia-Morales Canabal, M.D.  
Eduardo Garza Perez, M.D.  
Linda Geis, M.D. &  
J. Raymond Geis, M.D.  
Andreas Giger, M.D.  
Karen L. Giles, M.D.  
Ramin J. Golchini, M.D.

Richard S. Goldenson, M.D.  
Diane M. & Lawrence H. Goodman, M.D.  
Rachael E. Gordon, M.D. &  
Donald Snyder  
Clement J. Graggi, M.D.  
William A. Grasso, M.D.  
Francois Gudinchet, M.D.  
Salih Guran, M.D.  
Gail C. Hansen, M.D. &  
Juris Gaidulis  
Sheri L. Harder, M.D.  
Heather Rae & Robin A. Harle, M.B.B.S.  
**Mary R. & Donald P. Harrington, M.D.**  
Johnathan C. Hays, M.D.  
Tarek M. Helou, M.D.  
Guinel Hernandez Filho, M.D.  
Marcelo M. Herrasti, M.D.  
Nicole M. Hindman, M.D.  
Shozo Hirota, M.D.  
Nicholas R. Hoff Jr., M.D.  
Norinari Honda, M.D.  
Yukiko Honda, M.D.  
Arnold B. Honick, M.D.  
Kumiko & Masaaki Hori, M.D.  
Abi Raymer & Brooks A. Horsley, M.D.  
Michele &  
Reed M. Horwitz, M.D.  
Veerle De Boe &  
Guido W. Hubloux, M.D.  
Izumi Imaoka, M.D.  
Luciane & Klaus L. Irion, M.D., Ph.D.  
Maria &  
Rafael G. Isolani, M.D.  
Kenyu Iwasaki, M.D., Ph.D.  
Marcy B. Jagust, M.D.  
Gerardo Jeffery, M.D.  
Marta & Scott Jendra  
*In honor of Gerard Jendraszkiewicz*  
Sandra & Frederick A. Jones, M.D.  
Sandeep W. Joshi, M.D.  
Erick Jurado  
*In honor of Jack Tammen*  
Alexander C. Kagen, M.D.  
Andrew R. Kalinsky, M.D.  
Kuniyuki Kaneko, M.D.  
Laura &  
Monty P. Karoll, M.D.  
Katsuya Kato, M.D.  
Judi A. &  
Michael E. Katz, M.D.  
Timothy J. Kaufmann, M.D.  
Martha Kearns, M.D.  
Leslie Keighan, M.D.  
Renee Kelly, M.A.  
Samuel E. Kettenhofen, M.D.  
Myeong-Jin Kim, M.D., Ph.D.  
Gregory P. King Jr., M.D.  
Paul C. Koutras, M.D.  
Mary W. & Stanton S. Kremsky, M.D.  
Elizabeth T. Kutella, M.D. &  
Doug Kutella  
Jeong Min Lee, M.D.  
Bob Leigh  
*In honor of Gerald D. Dodd III, M.D.*  
Mary & John R. Leyendecker, M.D.  
Otavio B. Lima, M.D.  
Elizabeth A. Little, M.D.  
Hsien-Tzu Liu, M.D.  
Chi Fai Lo, M.D.Ch.B.  
Thomas Lossow, M.D.  
Magnus A. Ludviksson, M.D.  
Marcia & Robert R. Lukin, M.D.  
Caroline J. Lundell, M.D.  
Gina O. Macaraeg, M.D.  
**Vasantha &  
Mahadevappa Mahesh, M.S., Ph.D.**  
Carl R. Martino, M.D.  
Judith & Kenneth W. Matasar, M.D.

**INVEST**



**The RSNA R&E Foundation** provides the research and development that keeps radiology in the forefront of medicine. Support your future—donate today at [RSNA.org/Donate](http://RSNA.org/Donate).

*Continued on Page 18*

## Journal Highlights

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

### Cone Beam Computed Tomography during Transarterial Chemoembolization for Liver Cancer

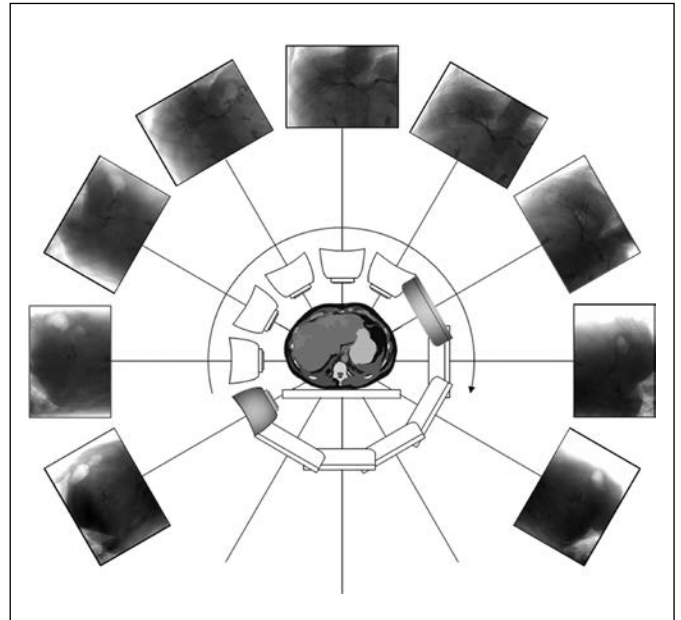
Cone-beam computed tomography (CBCT) has improved the feasibility, effectiveness and safety of many image-guided procedures, allowing physicians to perform procedures that were not possible using traditional fluoroscopy or digital subtraction angiography (DSA) alone.

CBCT has shown to affect diagnosis and treatment in up to 81 percent of hepatocellular carcinoma (HCC) lesions during trans-arterial chemoembolization (TACE) by providing 3D information that aids in lesion detection, catheter navigation and assessing technical success of embolization, according to a "How I Do It" paper in the January issue of *Radiology* ([RSNA.org/Radiology](http://RSNA.org/Radiology)) by Vania Tacher, M.D., of Johns Hopkins Hospital, and colleagues.

Since its introduction a decade ago, the utility of CBCT has been demonstrated in multiple disease states, including neurovascular disease, peripheral vascular disorders and oncology. The step from an exclusive 3D visualization of the vascular structures (rotational angiography–high contrast imaging) to soft tissue tomography (CBCT imaging–low contrast imaging) has opened the door to a range of new applications with low X-ray contrast.

Although the body of evidence has been growing over the last few years and many physicians and operators recommend its use, there is still no official consensus regarding the use of CBCT during TACE. "In light of the substantial clinical evidence available in the literature, we recommend that CBCT should be accepted as standard of care for imaging in intra-arterial therapy of HCC," the authors write.

**Radiology**



**CBCT imaging involves the rotation of a C-arm equipped with a flat panel detector around the patient. Multiple 2D projections are acquired and reconstructed to generate a 3D volumetric data set.**

(*Radiology* 2015;274;2:320–334) ©RSNA 2015 All rights reserved. Printed with permission.

This article meets the criteria for *AMA PRA Category 1 Credit*™. SA-CME is available online only.

### Postoperative Imaging of the Orbital Contents

Postoperative imaging of any anatomic structure can represent a diagnostic dilemma if one is unfamiliar with the typical procedures performed. Because the orbit is frequently visualized in routine radiologic examinations, postoperative changes of the globe and adnexa are invariably encountered.

In an article in the January-February issue of *RadioGraphics* ([RSNA.org/RadioGraphics](http://RSNA.org/RadioGraphics)), Michael J. Reiter, D.O., of Brooke Army Medical Center in San Antonio, Texas, and colleagues describe several of the more commonly performed ocular surgeries and their expected imaging features.

Awareness of the spectrum of orbital postoperative findings is imperative because their radiologic appearance can be confusing and potentially mimic pathologic entities. Knowledge of the MR imaging safety profile of these various implanted devices is critical for imagers, as is the ability to distinguish them from foreign bodies. CT and MR imaging are the two most frequently used modalities, although radiographs that encompass the orbits are occasionally employed.

"The radiologist's knowledge of expected imaging findings after orbital interventions can prevent confusion and misdiagnosis of implanted devices," the authors write.

**RadioGraphics**



**Implantation of an EX-PRESS device in a 32-year-old man with elevated IOP. Axial T2-weighted MR image shows an EX-PRESS device (arrow) in the superonasal region, which is seen as a signal void with minimal adjacent susceptibility artifact.**

(*RadioGraphics* 2015;35:221–234) ©RSNA 2015 All rights reserved. Printed with permission.

This article meets the criteria for *AMA PRA Category 1 Credit*™. SA-CME is available online only.



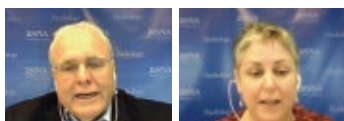
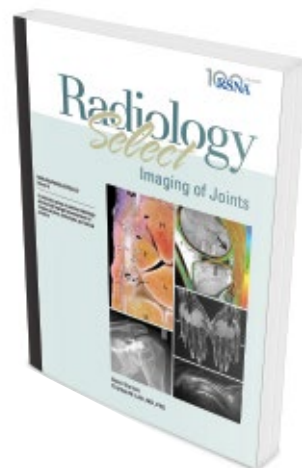
## Latest *Radiology Select* Volume Spotlights Imaging of Joints

From emergency room physicians and readers of outpatient images to musculoskeletal radiologists and clinicians and researchers, few disciplines are as relevant to as many different practitioners as the imaging of joints.

In Volume 6 of *Radiology Select*, guest editor Thomas M. Link, M.D., Ph.D., has curated a collection of 25 *Radiology* articles on imaging of joints with an emphasis on recent technical developments and newer concepts that all radiologists will find useful in daily practice.

The online educational edition of *Radiology Select: Imaging of Joints* includes opportunities to earn 22 SA-CME credits and provides access to video and audio conversations with Dr. Link, series editor Deborah Levine, M.D., and a prominent musculoskeletal radiologist and coauthor of several articles in the volume.

Access all volumes of *Radiology Select* at [RSNA.org/RadiologySelect](http://RSNA.org/RadiologySelect).



Listen to *Radiology* Editor Herbert Y. Kressel, M.D., deputy editors and authors discuss the following articles in the December issue of *Radiology* at [RSNA.org/Radiology-Podcasts](http://RSNA.org/Radiology-Podcasts).

- “Improved Prognosis of Women Aged 75 and Older with Mammography-detected Breast Cancer,” Judith A. Malmgren, Ph.D., and colleagues.
- “Intravenous Contrast Material Exposure Is Not an Independent Risk Factor for Dialysis or Mortality,” Robert J. McDonald, M.D., Ph.D., and colleagues.

- “Standard and Reduced Radiation Dose Liver CT Images: Adaptive Statistical Iterative Reconstruction versus Model-based Iterative Reconstruction—Comparison of Findings and Image Quality,” William P. Shuman, M.D., and colleagues.

## R&E Foundation Individual Donors

Continued from Page 16

Manuel Filipe D. Matias, M.D.  
Junichi Matsumoto  
Vasiliki Mavridou, B.Med.Sc.  
Erlinda S. McCrea, M.D. & Jay T. McCrea  
Melissa J. McGettigan, M.D.  
Liisa Valppu &  
Joseph S. McNally, M.D., Ph.D.  
Paula & David W. McVinnie, M.D.  
Gordon E. Melville, M.D.  
Joyce C. Mhlanga, M.B.B.Ch., F.R.C.R.  
Fiona Miller  
*In honor of Trish VanAlstyne*  
Jerrold H. Mink, M.D.  
Ayoob A. Mohammed Abid, M.B.Ch.B.  
Christopher C. Moore, M.D., Ph.D.  
Andres Moreno-De-Luca, M.D.  
Jose Morey, M.D.  
Sina Mossahebi, Ph.D.  
Kambiz Motamedi, M.D.  
Brendan T. Mullen, M.D.  
Rahmad Mulyadi, M.D.  
Rebecca Murray  
Andrew C. Neckers, M.D.  
Martin J. Nelson, M.D.  
Hiromu Nishitani, M.D., Ph.D.  
Evaldo D. Nobrega, M.D.  
Satoshi Noma, M.D., Ph.D.  
Renato H. Nunes, M.D.  
Seth D. O'Brien, M.D.  
George A. Oliff, M.D.  
Marta Onate Miranda, M.D.  
Jacqueline Ondrasch, M.D.  
Jane & Michael J. Opatowsky, M.D.  
Alexi Otrakji, M.D.

Ray C. Otte, M.D.  
James D. Overmeyer, M.D.  
Carolyn E. Parry, M.D.  
Michael M. Pass, M.D.  
Shodhan L. Patel, M.D.  
Eric J. Pike Jr., M.D.  
Diana Pineda, M.D.  
Michele & Martin L. Pinstein, M.D.  
Denise & Matthew S. Pollack, M.D.  
Uma R. Prasad, M.D.  
Emilia Pynnonen, M.D.  
Liat Kishon-Rabin &  
Andrew M. Rabin, M.D.  
Habib Rahbar, M.D.  
Kavita Rajkotia, M.D. &  
Murugusundaram Veeramani, M.B.B.S.  
Dhiraj Rajkumar, M.B.A., M.D.  
Ilene & Yale Richmond, M.D.  
Anna P. Riello, M.D.  
Mary Beth & Richard J. Rolfes, M.D.  
Benjamin M. Romney, M.D.  
Larry M. Rosen, M.D.  
Santiago E. Rossi, M.D.  
Dennis Rouw  
Sandra A. Ruhs, M.D.  
Richard W. Rutledge, F.R.A.N.Z.C.R.  
Nita Sahani, M.D. &  
Dushyant V. Sahani, M.D.  
Leila M. Salioni, M.D.  
Gonzalo Sanchez Jorda, M.D.  
Parmbir Sandhu, M.D.  
Angela & Michael A. Sargent, M.D.  
Loes Sauren, M.Sc., Ph.D.  
Deborah & Glenn A. Scheske, M.D.  
Russel Segal, M.D.  
Trudy & Kevin L. Shady, M.D.

Faisal M. Shah, M.D.  
Carol & Jon D. Shanser, M.D.  
Hayden Sharp, B.S.C.  
Swati &  
Dwarkanath S. Shembde, M.D.  
Jeffrey K. Short, M.D.  
Kevin A. Short, M.D.  
Elena & Jose Sierra, M.D.  
Claudia Juliana Rezende &  
Rogerio A. Silva, M.D.  
Jagadeesh Singh, M.D., F.R.C.R.  
Graziela & Leandro M. Siqueira, M.D.  
Beth M. Siroty-Smith, M.D.  
Connie M. Siu, M.D.  
Kimberly A. Spencer, M.D.  
Mellisa & Brandon S. St. Amant, M.D.  
Michael Stamm, M.D.  
Stephen Stein, M.D.  
William G. Tagg, M.D.  
Hidenobu Takagi, M.D.  
Sayuri & Noboru Tanigawa, M.D.  
Shelley Taylor  
Eric K. Thoburn, M.D.  
Ruedi F. Thoeni, M.D.  
Linda P. Thomas, M.D.  
Lauralee A. Thompson, M.D.  
Bradley R. Trotter, M.D.  
Katharine Tweed, F.R.C.R.  
Igor Tyurin, M.D.  
Alejandra R. Ulloa, M.D.  
Said Ulusoy, M.D.  
Shalini S. Umranikar, M.B.B.S.  
William A. Undie, Ph.D., R.T.  
Monica Caicedo &  
Juan N. Usecho, M.D.  
Fabio A. Uyeno

Pieter Jan van Doormaal I, M.Sc.  
Ronald L. Van Heertum, M.D.  
Kavita Rajkotia &  
Murugusundaram Veeramani, M.B.B.S.  
Fernanda G. Velloni, M.D.  
Daniel Demetrio M.  
Vizarreta, M.D., Ph.D.  
Christian G. Voelker, M.D.  
Richard G. Waggner, M.D.  
Jason M. Wagner, M.D.  
Marc A. Wallace, D.O.  
Takeyuki Watadani, M.D.  
Faith A. Weidner, M.D.  
Jean M. Weigert, M.D.  
David J. Weitz, M.D.  
Andrew T. West, M.B.B.S., F.R.C.R.  
Amanda M. Wiant, M.D.  
Robert C. Williams, M.D.  
Stephanie R. Wilson, M.D. & Ken Wilson  
David A. Wise, M.D.  
Ira S. Wolke, M.D., Ph.D.  
Jade J. Wong-You-Cheong, M.D.  
Jim S. Wu, M.D.  
Rolf Wytenbach, M.D.  
Rauf Yagan, M.D.  
Jason L. Yewell, M.D., J.D.  
Tamsin Knox & E. Kent Yucel, M.D.  
Megan M. Zare, M.D.  
Youssef Zeidan, M.D., Ph.D.  
Yvonne M. DeCuir, Ph.D. &  
Robert K. Zeman, M.D.  
Peter T. Zimmerman, M.D.  
William B. Zucconi, D.O.

## Radiology in Public Focus

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

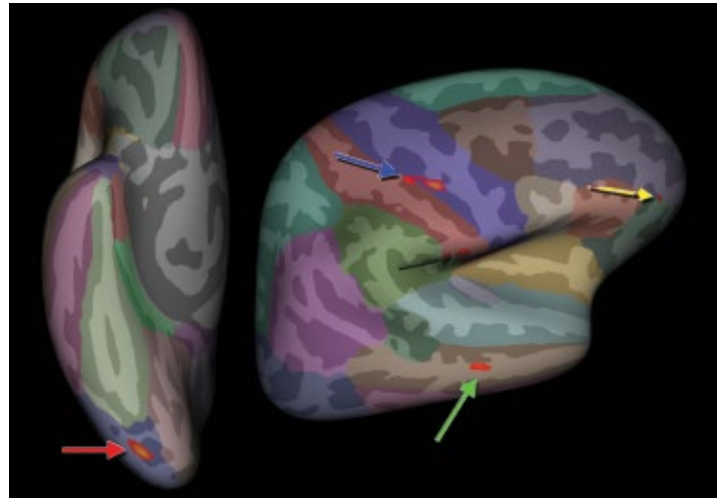
### Right Arcuate Fasciculus Abnormality in Chronic Fatigue Syndrome

Patients with severe chronic fatigue syndrome (CFS) have increased fractional anisotropy (FA) in the anterior right arcuate fasciculus when compared with control subjects, according to new research.

Michael M. Zeineh, M.D., Ph.D., of the Stanford University School of Medicine, and colleagues conducted a retrospective review of 15 patients with CFS and 14 age- and sex-matched control subjects. All subjects underwent 3.0-T volumetric T1-weighted MR imaging, with two diffusion-tensor imaging (DTI) acquisitions and arterial spin labeling (ASL). Open source software was used to segment supratentorial gray and white matter and cerebrospinal fluid to compare gray and white matter volumes and cortical thickness. DTI data were processed with automated fiber quantification, which was used to compare piecewise FA along 20 tracks. For the volumetric analysis, a regression was performed to account for differences in age, handedness and total intracranial volume, and for the DTI, FA was compared piecewise along tracks by using an unpaired t test. The open source software segmentation was used to compare cerebral blood flow as measured with ASL.

In the CFS population, FA was increased in the right arcuate fasciculus ( $P = .0015$ ), and in right-handers, FA was also increased in the right inferior longitudinal fasciculus (ILF) ( $P = .0008$ ). In patients with CFS, right anterior arcuate FA increased with disease severity ( $r = 0.649$ ,  $P = .026$ ). Bilateral white matter volumes were reduced in CFS (mean  $\pm$  standard deviation,  $467,581 \text{ mm}^3 \pm 47,610$  for patients vs.  $504,864 \text{ mm}^3 \pm 68,126$  for control subjects,  $P = .0026$ ), and cortical thickness increased in both right arcuate end points, the middle temporal ( $T = 4.25$ ) and precentral ( $T = 6.47$ ) gyri, and one right ILF end point, the occipital lobe ( $T = 5.36$ ). ASL showed no significant differences.

"(I)n populations of CFS that have severe concentration and memory problems, right anterior arcuate FA may serve as a biomarker for the disease," the authors write.



Superimposed on the inflated atlas brain image are regions of right-hemisphere increased cortical thickness in patients with CFS compared with control subjects after accounting for differences in age and handedness are highlighted in red (arrows). Blue = precentral, green = middle temporal, red = occipital, white = postcentral, and yellow = orbitofrontal. The right precentral region consists of two connected foci that FreeSurfer identified as one contiguous region.

(*Radiology* 2015;274;2:517-526) ©RSNA 2015 All rights reserved Printed with permission.

### Ebola Virus Disease: Radiology Preparedness

The 2014 West Africa outbreak of Ebola virus disease (EVD) is likely to involve staff in the radiology department for medical imaging procedures such as portable US and portal X-ray units, according to a special report in *Radiology*. It is essential that all medical staff receive general information and training about EVD.

David A. Bluemke, M.D., Ph.D., of National Institutes of Health, and Carolyn C. Meltzer, M.D., of Emory University School of Medicine, authored the special report to present an overview of relevant aspects of EVD disease and preparedness relevant to the radiologic community.

At present, the roles of medical imaging in EVD are supportive, to exclude other diagnoses or to assess complications of EVD. EVD brings the delicate balance of providing the best possible medical care for the patient while maintaining full protection for the medical staff. Both of these objectives are generally supported by providing medical imaging care to EVD patients

only within a specialized isolation unit. Clear and frequent communication with the healthcare staff is essential during this time of heightened public concern and understandable caution.

Radiology staff should work with hospital infection control staff to apply standard hospital policies to the radiology department. Hospital cleaning policies need to be presented to the radiology equipment manufacturer to ensure that equipment damage will not result from disinfection procedures. A material safety data sheet for cleaning solutions should be provided to equipment manufacturers as needed. Whenever possible, equipment should be covered or double bagged to protect sensitive surfaces and electronics.

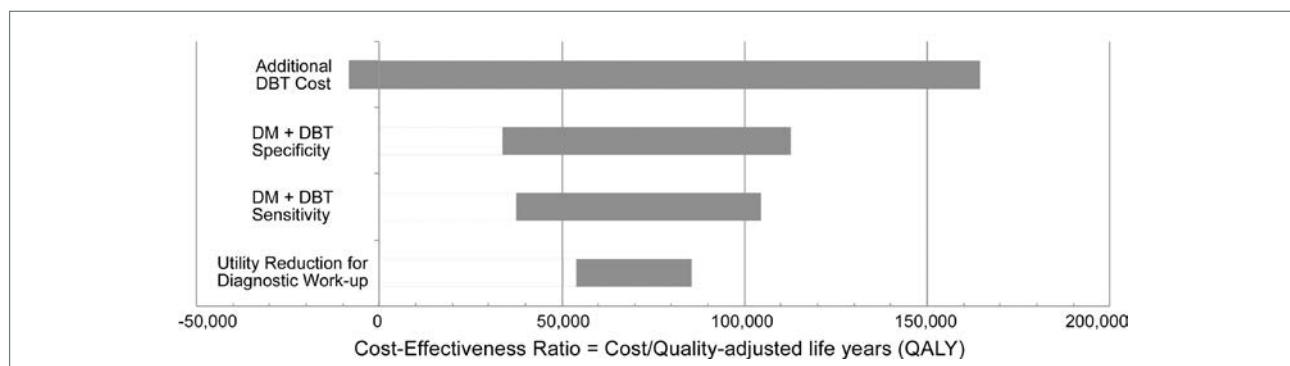
"A small minority of the radiology staff may be directly involved in the care of EVD patients," the authors write. "Those staff need to be identified and educated regarding procedures of the isolation unit and PPE. Open and frequent communications are essential to help radiology staff communicate with other areas of the hospitals and the clinical care team."

## Comparative Effectiveness of Combined Digital Mammography and Tomosynthesis Screening for Women with Dense Breasts

Biennial combined digital mammography and tomosynthesis screening for U.S. women aged 50–74 years with dense breasts is likely to be cost-effective if priced appropriately (up to \$226 for combined examinations vs. \$139 for digital mammography alone) and if reported interpretive performance metrics of improved specificity with tomosynthesis are met in routine practice, according to new research.

Christoph I. Lee, M.D., M.S.H.S., of the University of Washington, and colleagues used an established, discrete-event breast cancer simulation model to estimate the comparative clinical effectiveness and cost-effectiveness of biennial screen-

ing with both digital mammography and tomosynthesis versus digital mammography alone among U.S. women aged 50–74 years with dense breasts from a federal payer perspective and a lifetime horizon. Input values were estimated for test performance, costs and health state utilities from the National Cancer Institute Breast Cancer Surveillance Consortium, Medicare reimbursement rates and medical literature. Sensitivity analyses were performed to determine the implications of varying key model parameters, including combined screening sensitivity and specificity, transient utility decrement of diagnostic work-up and additional cost of tomosynthesis.



**Graph depicts sensitivity analysis for the cost-effectiveness of adding digital breast tomosynthesis (DBT) to standard biennial digital mammography (DM) screening in women aged 50–74 years with dense breasts. Additional cost of digital breast tomosynthesis ranged from \$0 to \$139; digital mammography with tomosynthesis specificity ranged from 0.88 to 0.95; digital mammography with tomosynthesis sensitivity ranged from 0.77 to 0.83; and transient utility reduction for diagnostic work-up after positive screening findings ranged from 0 to 0.105.**

(*Radiology* 2015;274;3:InPress) ©RSNA 2015 All rights reserved. Printed with permission.

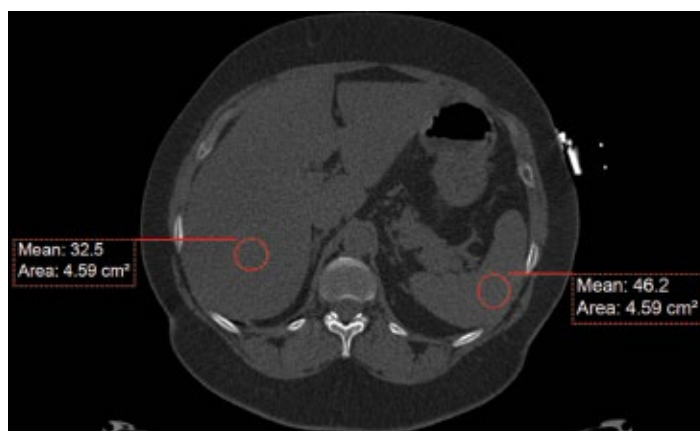
## High-Risk Coronary Plaque at Coronary CT Angiography Is Associated with Nonalcoholic Fatty Liver Disease, Independent of Coronary Plaque and Stenosis Burden: Results from the ROMICAT II Trial

Nonalcoholic fatty liver disease (NAFLD) is associated with advanced high-risk coronary plaque, independent of traditional cardiovascular risk factors and the extent and severity of coronary artery disease, new research shows.

Stefan B. Puchner, M.D., of Massachusetts General Hospital and colleagues studied 445 patients who were randomized to the coronary CT angiography (CTA) arm of the Rule Out Myocardial Infarction using CAT, or ROMICAT, II trial who underwent both non-enhanced CT to assess calcium score and contrast material-enhanced coronary CTA. Readers assessed coronary CTA images for the presence of coronary plaque, significant stenosis ( $\geq 50$  percent), and high-risk plaque features (positive remodeling, CT attenuation  $< 30$  HU, napkin-ring sign, spotty calcium). NAFLD was defined as hepatic steatosis at non-enhanced CT (liver minus spleen CT attenuation  $< 1$  HU) without evidence of clinical liver disease, liver cirrhosis or alcohol abuse.

Overall, 182 (40.9 percent) of 445 patients had CT evidence of NAFLD. High-risk plaque was more frequent in patients with NAFLD than in patients without NAFLD (59.3 percent vs. 19.0 percent, respectively;  $P < .001$ ). The association between NAFLD and high-risk plaque (odds ratio, 2.13; 95 percent confidence interval: 1.18, 3.85) persisted after adjusting for the extent and severity of coronary atherosclerosis and traditional risk factors.

“Our observation supports a relationship between NAFLD and advanced high-risk coronary atherosclerosis, possibly related to dysregulated secretion of cytokines, increased oxidative stress, and systemic inflammation,” the authors write.



**Axial nonenhanced CT image in a 62-year-old man demonstrates attenuation measurements of the liver and spleen. Image shows a diffuse fat accumulation in the liver, with a mean liver attenuation of 32.5 HU and a mean spleen attenuation of 46.2 HU.**

(*Radiology* 2015;274;3:InPress) ©RSNA 2015 All rights reserved. Printed with permission.

Continued on Page 22



## Education and Funding Opportunities

### Online Ethics, Professionalism Courses Get a Makeover

Online courses on ethics and professionalism at [RSNA.org/Library](http://RSNA.org/Library) have recently been updated and redesigned to offer an even more comprehensive and engaging user experience.

Highlighting timely ethical considerations in radiology, topics include "Conflicts of Interest," "Ethics of Research" and "Publication Ethics."

The courses were developed by the American Board of Radiology Foundation in 2011 with educational grants from RSNA, Academy of Radiology Research, American Association of Physicists in Medicine, American Board of Radiology, American College of Radiology (ACR), American Radium Society and American Society for Radiation Oncology.

"Professionalism is the basis of medicine's contract with society," said Stephen D. Brown, M.D., chair of the RSNA Professionalism Committee. "These online courses help educate radiologists on how to navigate tricky ethical situations that may arise in the workplace or

during academic research. This update and review allows the committee to ensure the courses remain on point with the most current ethical questions and challenges."

During the update process, original authors of the courses reviewed content, provided timely updates and raised additional ethical considerations. The update also included peer review by members of the RSNA Professionalism Committee and ACR's Committee on Professionalism.

Users will also experience a new interface incorporating easier navigation, allowing them to view topics at their own pace and visit and re-visit sections anytime. An automatic bookmarking feature allows users to immediately resume where they left off in the courses. Many online courses now include interactive self-learning components to provide a more engaging experience for the learner and have been mobile optimized.

"Learners are increasingly using

mobile devices to access the Internet," said Stephen Chan, M.D., vice-chair of the RSNA Professionalism Committee and one of the project's leaders. "We've taken advantage of this update and review process to overhaul the courses' design to ensure accessibility, interactivity and ease of navigation by a variety of electronic devices."

Each self-guided course includes a CME test feature to help learners assess their comprehension and application of the principles and practices described in the course. Users earn CME credit for successful completion (80 percent or better score) of the tests. Each course is designated for 1.50 *AMA PRA Category 1 Credits*<sup>™</sup> and can be applied toward the ABR MOC self-assessment requirement.

Free to RSNA members, courses are located under Supplemental Online Education at [RSNA.org/Library](http://RSNA.org/Library). For questions about Ethics and Professionalism courses, contact [ed-ctr@rsna.org](mailto:ed-ctr@rsna.org).

### Nomination Forms for IRIYA at RSNA 2015 Now Available

Amy Sevaio, M.D., a radiology trainee at Auckland City Hospital in Auckland, New Zealand, couldn't wait to return home from RSNA 2014 to share her experiences from the RSNA Introduction to Research for International Young Academics (IRIYA) program.

The four-day seminar held at each RSNA annual meeting encourages young radiologists from countries outside the U.S. and Canada to pursue careers in academic radiology by:

- Introducing residents and fellows to research early in their training
- Demonstrating the importance of research to the practice and future of radiology
- Sharing the excitement and satisfaction of research careers in radiology
- Networking with successful radiology researchers, future colleagues and potential mentors

Reflecting on her experience at RSNA 2014, Dr. Sevaio said her country is fairly isolated and that IRIYA is "very good, very useful," in terms of getting a feeling for "what's happening" in radiology, adding she is the only person in Australasia (Australia

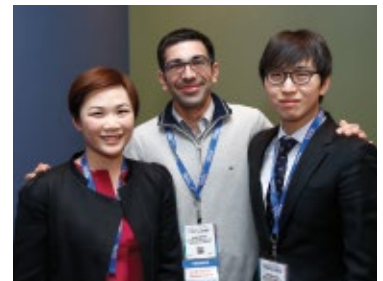
and New Zealand) who is earning a Ph.D. in medical imaging.

"This program is really great," said Dr. Sevaio, who plans to be an academic radiologist focusing on translational research. "I'm going to start using what I was taught [during the seminar] straight away."

Nominations are now being accepted for IRIYA to be held at RSNA 2015. The RSNA Committee on International Radiology Education (CIRE) recommends 15 young academics for consideration by the RSNA Board of Directors each year.

Eligible candidates are residents and fellows currently in radiology training programs or radiologists not more than two years out of training from outside the U.S. and Canada, who are beginning or considering an academic career. Nominations must be made by the candidate's department chairperson or training director. Fluency in English is required.

Nomination forms are available at [RSNA.org/IRIYA](http://RSNA.org/IRIYA) and must be submitted by April 15, 2015.



**From left: Amy Sevaio, M.D., Mickael Ohana, M.D., and Chong Hyun Suh, M.D., at the RSNA 2014 IRIYA seminar.**

### Final Call to Register for Writing a Competitive Grant Proposal Workshop

A few spots remain for the RSNA Writing a Competitive Grant Proposal Workshop to be held March 6-7, 2015. Limited space is available. Register at [RSNA.org/CGP](http://RSNA.org/CGP).

## Medical Meetings February-March 2015

### FEBRUARY 5-8

American Society of Spine Radiology (ASSR), Annual Symposium, Caesar's Palace, Las Vegas  
• [www.theassr.org](http://www.theassr.org)

### FEBRUARY 18-21

Sociedad Mexicana de Radiología e Imagen / Mexican Society of Radiology and Imaging, XXVII Encuentro Nacional de Residentes y Radiólogos / XXVII National Meeting of Residents and Radiologists, Mexico City  
• [www.smri.org.mx](http://www.smri.org.mx)  
Visit the [RSNA Booth](#)

### FEBRUARY 21-26

International Society for Optics and Photonics (SPIE), Medical Imaging 2015, Renaissance Orlando at SeaWorld, Orlando, Florida  
• [www.spie.org](http://www.spie.org)

### FEBRUARY 28-MARCH 5

Society of Interventional Radiology (SIR), 40th Annual Scientific Meeting, Georgia World Congress Center, Atlanta  
• [www.sirweb.org](http://www.sirweb.org)

### MARCH 2-6

American Physical Society (APS), March Meeting, Henry B. Gonzalez Convention Center, San Antonio  
• [www.aps.org](http://www.aps.org)

### MARCH 4-8

The European Society of Radiology (ESR), European Congress of Radiology (ECR), Vienna  
• [www.ecr.org](http://www.ecr.org)  
Visit the [RSNA Booth](#)

### MARCH 6-8

Society for Brain Mapping and Therapeutics (SBMT), 12th Annual World Congress of SBMT on Brain, Spinal Cord Mapping, and Image Guided Therapy, Los Angeles Convention Center  
• [www.worldbrainmapping.org](http://www.worldbrainmapping.org)

### MARCH 14-15

Asian Musculoskeletal Society (AMS), 17th Annual Meeting, Hyderabad International Convention Centre, Hyderabad, India  
• [www.asianmsk.org](http://www.asianmsk.org)

### MARCH 15-18

Society of Thoracic Radiology (STR), Thoracic Imaging 2015, Park Hyatt Aviara, Carlsbad, California  
• [www.thoracicrad.org](http://www.thoracicrad.org)

### MARCH 21-25

American Institute of Ultrasound in Medicine (AIUM), Annual Convention and host of The World Federation for Ultrasound in Medicine and Biology Congress (WFUMB), Walt Disney World Swan & Dolphin Resort, Lake Buena Vista, Florida  
• [www.aium.org](http://www.aium.org)

### MARCH 22-27

Society of Abdominal Radiology (SAR), Annual Scientific Meeting and Educational Course, Hotel del Coronado, Coronado (San Diego), California  
• [www.abdominalradiology.org](http://www.abdominalradiology.org)  
Visit the [RSNA Booth](#)

FIND MORE EVENTS AT  
[RSNA.org/Calendar.aspx](http://RSNA.org/Calendar.aspx)

## Radiology in Public Focus Continued from Page 20

### New on *RadiologyInfo.org*

Visit *RadiologyInfo.org*, the public information website produced by the RSNA and ACR, to read the latest content posted to the website:

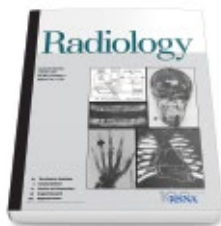
- Anal Cancer Treatment  
[RadiologyInfo.org/en/info.cfm?pg=anal-cancer-therapy](http://RadiologyInfo.org/en/info.cfm?pg=anal-cancer-therapy)
- Esophageal Cancer Treatment  
[RadiologyInfo.org/en/info.cfm?pg=esophageal-cancer-therapy](http://RadiologyInfo.org/en/info.cfm?pg=esophageal-cancer-therapy)
- Ovarian Cancer Disease  
[RadiologyInfo.org/en/info.cfm?pg=ovarian-cancer](http://RadiologyInfo.org/en/info.cfm?pg=ovarian-cancer)

**RadiologyInfo.org**

## FEBRUARY PUBLIC INFORMATION OUTREACH ACTIVITIES FOCUS ON HEART HEALTH

In recognition of American Heart Month in February, RSNA is distributing public service announcements (PSAs) focusing on heart disease and screening.

In addition, RSNA is distributing the "60-Second Checkup" audio program to nearly 100 radio stations across the U.S. The segments will focus on heart disease and the link between atherosclerosis and cognitive impairment.



## Media Coverage of RSNA

In October, 1,273 RSNA-related news stories were tracked in the media. These stories reached an estimated 599 million people.

Coverage included *Los Angeles Times*, *U.S. News & World Report*, *Chicago Tribune*, *The Huffington Post*, *TIME*, *Yahoo! News*, *Newsday*, *The Boston Globe*, *CNN.com*, *Bloomberg News*, *San Francisco Chronicle*, *WBBM-AM* (Chicago), *KYW-AM* (Philadelphia) and *WebMD*.

## RSNA Wins Three MarCom Awards

RSNA received three 2014 MarCom Awards from the Association of Marketing & Communications Professionals, an international awards competition that recognizes outstanding creative achievement.

### Platinum Awards:

- RSNA 2013 Annual Meeting Press Kit

### Gold Awards:

- A television segment about RSNA 2013 research on face transplants that appeared on WGN-TV news.
- An article about the RSNA Image Share project (funded by the National Institute of Biomedical Imaging and Bioengineering) appearing in *The Wall Street Journal*

For more information, go to [marcomawards.com](http://marcomawards.com).



## Residents & Fellows Corner

### New RFC Vice-chair: RSNA Can be “One-stop Shop” for Career Preparation

*RSNA News* took time recently to catch up with Nancy J. Benedetti, M.D., newly appointed vice-chair of the RSNA Resident and Fellow Committee (RFC), who talked about what she gains as an RSNA member and how she wants to give back.



**Benedetti**

**Q:** *What kind of issues face residents and fellows today, and how can RSNA help address them?*

**A:** With the restructuring of the American Board of Radiology (ABR) certifying exam format in 2013, diagnostic radiology residents and fellows are stressed about exam preparation, specifically finding the right study materials at the appropriate point in training. Currently, educational resources are spread out across the Internet in many locations—journals, radiologic societies, academic centers and privately run websites. RSNA has a huge opportunity to be the one-stop shop for residents preparing for the new boards.

**Q:** *What are some ways in which residents and fellows can contribute to the RSNA mission?*

**A:** Residents and fellows have the biggest stake in the future direction of our field and early involvement with RSNA will spark trainees to become leaders. In particular, when trainees get excited about research supported by the RSNA Research & Education (R&E) Foundation, they will keep pursuing their passion for science in their future careers. With the support RSNA gives them to get started, trainees will give back to the field of radiology more than they received.

**Q:** *What is your vision for the Resident and Fellow Committee and what it can accomplish?*

**A:** The committee brings together radiology trainees from around the world to help RSNA provide programming geared to trainees. The committee already sponsors a popular career symposium for trainees at the annual meeting, and I see this programming continuing to offer career advice beyond

what is provided in residency and fellowship. An as yet unmet need of residents and fellows is a curriculum tailored toward the new ABR exam. I envision the committee pooling RSNA educational resources and presenting them in an organized fashion that will be useful for trainees in their exam preparation.

**Q:** *How has involvement with RSNA benefitted you and your career?*

**A:** Through the committee, I have met like-minded enthusiastic radiology trainees from around the world and have enjoyed sharing ideas across radiology training programs. The many close friends I have made at different stages of training have helped me as I have progressed through the early stages of my career.

The educational resources RSNA provides free of charge to trainees ([RSNA.org/Trainees.aspx](http://RSNA.org/Trainees.aspx)) have played a tremendous role in my training. As a member of the first class of residents to take the new ABR Core Exam, I was very grateful to have the outstanding RSNA-AAPM physics modules as a study tool. The new *RadioGraphics* Resident & Fellow online education content has been extremely useful for my ongoing preparation for the ABR certifying exam that I will take 15 months after

#### EDITOR'S NOTE

**Nancy J. Benedetti, M.D.**, is a clinical fellow in the Department of Radiology at the University of California, San Francisco, School of Medicine.

## Value of Membership

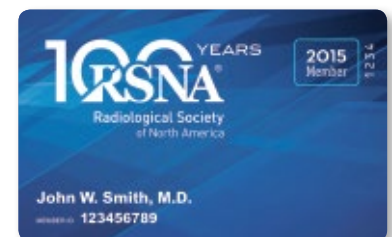
### Renew Your RSNA Membership Now

RSNA membership includes many benefits, such as your subscription to *RSNA News* and:

- Subscriptions to *Radiology* and *RadioGraphics*
- Free tools to help with continuing medical education
- Free advance registration to the RSNA annual meeting

Renew online at [RSNA.org/Renew](http://RSNA.org/Renew) or by mail with the invoice sent to you in early October. Members can also sign up for automatic renewal, a new, convenient feature that allows RSNA to charge a designated credit card for annual membership dues.

For more information, including how to apply for retired status, contact [membership@rsna.org](mailto:membership@rsna.org) or 1-877-RSNA-MEM (1-877-776-2636) or 1-630-571-7873 outside the U.S. and Canada.





## Annual Meeting Watch

### RSNA 2015 Online Abstract Submission Open

The online system to submit abstracts for RSNA 2015 was activated in late January. The submission deadline is noon Central Time (CT) on Wednesday, April 8, 2015. Abstracts are required for scientific presentations, education exhibits, applied science, quality storyboards and quantitative imaging reading room showcase.

To submit an abstract online, go to [RSNA.org/abstracts](http://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 abstract submissions, contact the RSNA Program Services Department at 1-877-776-2227 within the U.S. or 1-630-590-7774 outside the U.S.

CALL FOR  
ABSTRACTS



#### Important Dates for RSNA 2015

Wednesday, April 29	Member registration and housing open at 9 a.m. CT
Wednesday, June 3	Non-member registration and housing open at 9 a.m. CT
Wednesday, July 8	Course enrollment open at 9 a.m. CT
Friday, October 16	Deadline for international badge mailing
Friday, November 6	Final housing and discounted registration deadline at 5 p.m. CT
Wednesday, November 25	Deadline to guarantee a seat for all ticketed courses at 5 p.m. CT
November 29 – December 4	101st Scientific Assembly & Annual Meeting

100  
RSNA 2015

### RSNA 2014 Attendance On the Rise

Attendance for RSNA's 100th annual meeting in 2014 remained strong and set new records in the member and international attendee categories.

More than 15,000 members attended RSNA 2014, a 13 percent increase over the previous year, while the 11,470 international attendees at the meeting set an all-time record. Overall attendance at RSNA 2014 totaled more than 56,000.



## RSNA.org



### R&E Website Spotlights Funding Campaign

The RSNA Research and Education (R&E) Foundation website—accessible at [RSNA.org](http://RSNA.org)—now highlights the unveiling of “*Inspire-Innovate-Invest: The Campaign for Funding Radiology's Future*®,” officially launched at RSNA 2014.

In addition, the site is now easier to navigate, giving users instant access to pertinent information. At the click of a mouse, users can review a detailed explanation of the Campaign's goal to raise \$17.5 million to fund grants in radiologic research and education, bridging gaps in funding for promising investigators and educators. The site also highlights testimonials from grant recipients and donors.

In addition to Campaign information, users are invited to access other resources available at [RSNA.org/Foundation](http://RSNA.org/Foundation).

- Detailed information, applications and deadlines for the Roentgen Resident/Fellow Research Award, and available grants in three categories: education, research and medical school.
- Your Donations in Action—See the work grant recipients are producing that help continue to fuel radiology's future.
- Foundation Focus—A quarterly publication that keeps readers abreast of the latest developments in the Foundation.

## COMING NEXT MONTH

In March, *RSNA News* examines the promise and potential of 3D printing, including reports on a 3D model of the heart and a 3D-printed vertebra.

REDISCOVER THE ARTICLES  
THAT DEFINED RADIOLOGY

# Radiology GOLDEN OLDIES

As part of the RSNA Centennial celebration, RSNA looks back on the discoveries and advancements that have come to define radiology. Each month in 2015, *Radiology* will highlight 15 articles that have been instrumental in advancing the science of radiology and improving patient care.



Read the collections at [RSNA.org/Golden-Oldies](http://RSNA.org/Golden-Oldies)

100 YEARS  
RSNA®