

DailyBulletin

INSIDE TUESDAY



- Quality Control System Needed for Hospital-Based 3D Models
 Proper workflow and quality control help minimize negative consequences of 3D model use. 3A
- How Radiologists Can Help Ensure All Patients Have Access to the Right Diagnostic Team Collaboration with health care teams in other fields to implement change will

decrease disparities. 4A

- Online Patient Portals May Contribute to Health Care Disparities
 Digital health interventions can widen the digital divide and add to inequities. 4A
- Working With Patients Can Help Develop More Effective Lung Cancer Screening Outreach Community-based outreach encouraging

lung cancer screening can help overcome worse lung cancer outcomes. **5A**

 Underserved Communities Hit Harder by Pandemic Disruption to Lung Cancer Screening

Lung cancer screening declines sharply at a diverse inner-city medical center during the pandemic. **5A**

Fast 5 Speakers Give Their Take on Redefining Radiology Five presenters share thoughts on nonclinical topics including health care access, AI and family leave. 7A

- Monday Plenary Dedicated to E. Robert Heitzman, MD Former RSNA president and acclaimed researcher in the anatomy and diseases of the lungs remembered. 7A
- Study Supports Discontinuation of Patient Shielding in Pediatric Digital Radiography

Shielding presents substantial risks including patient motion and artifacts leading to repeat exams. **10A**

EXCLUSIVE ONLINE CONTENT

- AI Shows Promise in Assessing COVID-19 Pneumonia
- Understanding the (Electronic)
 Smoking Behaviors of Former Smokers
- Reduced Levels of "Hunger Hormone" Linked to Weight Loss in BEAT Obesity Trial



Defining Radiology's Role in Value-Based Health Care

By Lynn Antonopoulos

"If we don't engage as players in this value-based health care arena, then other specialties and other organizations will be looking to define their role in value-based health care, and we may become pawns to their initiatives," said James A. Brink, MD.



In his Monday Plenary lecture, Dr. Brink drew from a variety of published studies and institutional efforts, and shared his thoughts on how to establish and assert the value of radiology in the health care continuum.

He said that whether working alone or as part of collective departments, radiologists must understand the principles behind cost allocation and the value-chain concept and must take value-based health care into account at all stages of care delivery.

While he acknowledged the importance of promoting high-value imaging, Dr. Brink first spoke about the importance of eliminating low-value imaging and attributed poor imaging decisions, in part, to organizational culture.

Dr. Brink said it is necessary to develop policies and interventions to better align patient and clinician motivations. "We need to overcome cultural challenges to avoid those knee-jerk reflex actions that might lead us to delivering low-value care."

CONTINUED ON PAGE 2A

MR Guided Focused Ultrasound Surgery Can Reduce Pain, Improve Quality Of Life In Patients With Palliative Bone Cancer By Melissa Silverberg

An emerging method of magnetic resonance guided focused ultrasound surgery (MRgFUS) may be a good option for the palliative treatment of patients with metastatic bone disease, according to results presented during the "Best of Clinical Trials" session.

Alessandro Napoli MD, PhD, professor of radiology in the Department of Radiological, Oncology and Pathological Science at the Sapienza University of Rome where he is also head of the MR-Guided Focused Ultrasound Treatment Unit, presented the research.

"The purpose of the study was to assess the efficiency and safety of the two different techniques for treatment of painful bone metastases," Dr. Napoli said. "In our experience, this technique can provide rapid pain relief without radiation or invasive procedures, low rate of adverse events, and can be considered an alternative to external beam radiation therapy (EBRT)."

MRgFUS includes using high intensity focused ultrasound to pinpoint a small target and provide a therapeutic effect by raising

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Napoli

Excellence, Respect and

Radiology: Challenging

Dr. Johnson draws on her

life experience as a Black

examine how all radiologists

woman in radiology to

might live and work

Responsibility in

Barriers

Arvey Field

9:30-10:30 A.M.

10 A.M. - 5 P.M.

10 A.M. - 5 P.M.

10:15-10:30 A.M.

Technical Exhibits

Industry Presentations

South Hall, Booth 1118

in Pregnant Patients

Professional Portrait Studio

Science and Education Sessions

Discovery Theater Entertainment

Science and Education Sessions

Grand Concourse Entertainment

8-9A.M

9 A.M.

10 A.M.

Tuesday At a Glance <u>6:30 – 8:30 A.M.</u> Fun Run

Plenary Lectures

11 a.m.-12 p.m. | Arie Crown Theater Michele H. Johnson, MD



Johnson



responsibly. **Christine Porath, MD** Mastering Civility An international speaker, author and researcher, Dr. Porath shares her thoughts about the costs of incivility in organizations and what leaders should do to craft a more respectful work environment.

Note: Dr. Porath's lecture is only available for live viewing and will not be available on demand.

Tuesday's Physics Quiz

The radiation risk (as measured by effective dose) for a 4-view creening mammogram is closest to what other imaging procedure? A. Non-Contrast CT Head B. Barium Meal C. Radiograph [Answer on page 7A.]

11 A.M. - 12 P.M. Meet the *RadioGraphics* Podcasts Editors: Wende Gibbs, MD **Ross Frederick, MD** South Hall, Booth 1000 11 A.M. – 12 P.M. Science and Educat 12:15 - 1:15 P.M. **Poster Discussions** Learning Center 1 – 2 P.M. Meet the RSNA Jou Charles E. Kahn, N Radiology: Artificia South Hall, Booth 1 1:15-1:30 P.M. **RadioGraphics** Pod **Education in a Dig** Image Wisely: Comparing VQ & CT Discovery Theater **Radiation Dose When Evaluating PE** 1:30-2:30 P.M. Science and Educat 2-3 P.M. Meet the RSNA Jo David A. Bluemke, Radiology South Hall, Booth 1 3-4 P.M. Science and Educa 4-5 P.M. **Poster Discussions** Learning Center

View the full progra to My Agenda at M

CONTINUED FROM PAGE 1A

MR Guided Focused Ultrasound Surgery

the temperature high enough to destroy the target with no damage to surrounding tissue. MRI is used to guide and control the treatment

This method has been used in the treatment of other conditions, but adoption has been slow for the palliation of bone metastases where EBRT is the standard of care. However, according to co-author Giulia Alfieri, MD, Department of Radiology at Policlinico di Roma in Rome, many patients do not experience any pain relief after initial EBRT and up to 50% of initial responders experience pain relapse within one year of treatment.

Patients Experienced Complete or Partial Pain Response

The study included 198 participants with painful bone metastases between January and March 2019. Within that group, 100 underwent MRgFUS and 98 underwent EBRT. Patients who received MRgFUS treatment reported a significant difference in physical function, appetite, nausea and vomiting, dyspnea and quality of life.

At one month, 91% of patients treated with MRgFUS had complete or partial pain response compared to 67% of patients treated with EBRT. At final follow-up, 74% in MRgFUS and 34% in radiotherapy had a complete pain response.

Dr. Napoli said large, randomized trials are still necessary to validate the research, but that ultrasound guided treatment should be considered as an alternative to radiotherapy in patients with painful bone metastases.

One limitation of the study was the difference in treatment availability, Dr. Napoli DailyBulletin

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CONTINUED FROM PAGE 1A Defining Radiology's Role

Dr. Brink noted that decision support may be the most effective tool in eliminating low-value imaging. He recommended practitioners use decision support tools before imaging to help determine the most appropriate imaging exams and said radiologists can leverage them after imaging to ensure the most appropriate recommendations are made according to imaging findings.

Promote High-Value Imaging and Reduce Costs

Dr. Brink said improved quality and better patient experience are two key elements of the high-value imaging equation. "It's really about improving quality, accurate diagnoses and precise measurements; improving experience with timely and convenient service; and integrating imaging care into the care continuum of the patient's experiences," he said.

He cited strategies for patient engagement, virtual care, ambulatory access and care coordination as important considerations in delivering the best patient experience. He also addressed the impact of administration in the equation. "Managers who plan to provide our resources for health care services need to understand the cost of undersupplying radiology, but we must actively ensure that the use of our services are justified, appropriate and, ideally, evidence-based," Dr. Brink said.

Turning to efforts to reduce imaging costs and increase efficiency, Dr. Brink said it was important to shift service from high cost sites like hospitals to lower cost sites like clinics. He said to provide patients and families with a seamless and consistent experience wherever they are within the

"Managers who plan to provide our resources for health care services need to understand the cost of undersupplying radiology, but we must actively ensure that the use of our services are justified, appropriate and, ideally, evidence-based."

James A. Brink, MD

health system, it's necessary to control the cost of care by both managing site of service and leveraging decision support tools.

Dr. Brink participated in a recent effort conducted by the International Society for Strategic Studies in Radiology to develop a strategic plan to guide radiology to a new era of value-based health care. The experience resulted in a series of targeted goal areas, from which six prioritized tactics emerged. He plans to work with leaders of health care organizations to look at programs they may use to pursue these tactics.

Dr. Brink is chair of radiology and chief of Enterprise Radiology at Mass General Brigham. Dr. Brink also serves as radiologist-in-chief at Massachusetts General Hospital and is the Juan M. Taveras Professor of Radiology at Harvard Medical School.

Access the presentation, "Radiology in the Value-Based Healthcare Arena: Player or Pawn?" (M3-PL02) on demand at Meeting.RSNA.org.

noted. Radiotherapy was easier and faster to access, whereas ultrasound surgery required a longer set-up with more days between actual treatment from enrollment. Those challenges could be overcome with greater adoption of MRgFUS.

"MRgFUS in comparison to EBRT showed promising response when used as a palliative treatment in patients with painful bone metastases," Dr. Alfieri said. "MRg-FUS may represent a valid option for the palliative treatment of patients with metastatic bone disease, with promising results in terms of pain relief and quality of life when compared to EBRT.'

Following the presentation, Bruce G. Haffty, MD, chief of staff, Rutgers Cancer Institute of New Jersey, professor and chairman of radiation oncology, Rutgers-Robert Wood Johnson Medical School, and RSNA president-elect discussed the results.

"Bone metastasis is a common clinical issue and the most common cause of cancer related pain we see as radiation oncologists," Dr. Haffty said.

Dr. Haffty noted that Dr. Napoli's work is a novel and cutting-edge approach to treat bone pain in metastatic disease."

However, since the trial was not randomized, he said the topic would require further research to understand if one treatment option is better than the other.

Access the presentation, "Magnetic Resonance-Guided Focused Ultrasound Versus External Beam Radiation Therapy for the Treatment of Pain in Bone Metastases: A Phase II Trial," (M4-RCP48) on demand at Meeting.RSNA.org.

Discovery Theater Please note rooms will be cleared for 30 minutes between sessions for cleaning.

Quality Control System Needed for Hospital-Based 3D Models

A hospital-based quality control system for 3D models will reduce the likelihood of errors in surgical planning, resulting in better patient outcomes, said Nicole Wake, PhD, director of the 3D Imaging Lab at Montefiore Medical Center in New York City.

By Richard Dargan

Hospital-based 3D printing labs make patient-specific anatomic models from medical imaging data to help surgeons plan and practice detailed surgeries. The labs also make custom surgical guides used during operations. Use of 3D models has led to decreased time on the operating table, faster patient recovery times, improved

patient outcomes and overall decreased hospital costs.

In order to be useful to the clinician, 3D printed anatomic models must reliably represent the patient's anatomy, a challenge when the workflow to create the models is so complex.

"If a 3D printed model does not accurately reflect

the patient's true anatomy, then it is possible that errors in surgical planning may occur," Dr. Wake said. "Instead of improving patient outcomes, inaccurate models may negatively affect those outcomes."

Quality Control Protocols Help Ensure Accuracy, Safety

Proper workflow and quality control procedures can minimize the negative consequences of using 3D printed models, according to Dr. Wake, a leader in the field.

Coupons/phantoms with specific geometries may be created and printed to ensure

that the printing process is accurate. Verification can be performed through visual inspection, caliper measurements and surface scanning to validate the quality of the anatomic models. CT scanning after printing also can help avoid errors. Measurements obtained from the 3D printed models may be compared to the source imaging data to

verify accuracy. "The process of 3D printing from medical imaging data is very complex and errors can occur at any stage," Dr. Wake said. "This is why it's important to have experts managing the process and implementing proper workflow procedures and strict quality control

mechanisms to ensure that patient-specific anatomic models are

accurate and enhance pre-surgical planning." Sterilization, a necessary step for models used as surgical guides that come in contact with patients during operating procedures, represents another challenge for the makers of 3D models. The sterilization process may

affect the material properties of a final 3D printed model. "For any model that will make contact with patients in the operating room, it is imperative that printing is performed with a biocompatible, sterilizable material and that

proper instructions for use regarding steril-



Wake

ization are performed to ensure the printed part is not modified during the sterilization procedure," Dr. Wake said.

The education exhibit, "Establishing a Hospital-Based Quality Control System for 3D Printed Anatomic Models," provides several examples of potential workflow errors and possible causes. View the complete exhibit in the Learning Center or at Meeting. RSNA.org.

If a 3D printed model does not accurately reflect the patient's true anatomy, then it is possible that errors in surgical planning may occur"

Nicole Wake PhD

Support the R&E Foundation on Giving Tuesday

The RSNA R&E Foundation is participating in #GivingTuesday, a day of generosity celebrated around the world.



The #GivingTuesday movement began in 2012 as a way to inspire people to do good and give back to their communities. In less than a decade, #GivingTuesday has unleashed

the power of radical generosity across the globe. Celebrate the radiological community on #GivingTuesday by making a donation to the R&E Foundation at RSNA.

org/Donate or by visiting the R&E Foundation Booth in the Connections Center. You can also show your support by

purchasing a limited-edition Foundation beverage tumbler for \$20. Your donations fund the future of radiology by supporting advances in research and innovative teaching methods. In 2021, the Foundation directed funding to 85 individuals at 40 institutions, and since the Foundation's inception, over 1,500 individuals have received funding.

Please contribute to the Foundation today and share your support across social media with the #GivingTuesday and #RSNA21 hashtags.

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Hanukkah sameach!

May you have a happy and peaceful holiday.



Online Patient Portals May Contribute to Health Care Disparities

Factors such as age and ethnicity may make some patients less likely to use an online portal for self-scheduling mammograms. These findings have important implications regarding how technology can unintentionally increase health care inequalities, according to Patricia Balthazar, MD, assistant professor, abdominal radiology & imaging informatics at Emory University in Atlanta.

"As an imaging informaticist, I am interested in using technology solutions to improve patient quality and safety, and efficiency of health care delivery," Dr. Balthazar said. "However, as a health services researcher, I understand digital health interventions can widen the digital divide and may add to health inequities."

This retrospective cohort study, per-

total of 46,268 female patients who had screening mammograms from Jan. 1, 2018 to Dec. 31, 2019. The investigators obtained data from the institutional data warehouse on the following patient variables: scheduling pathway. age, language, race, health insurance provider and zip code.

The researchers obtained census data based on the patient's zip code, including



These bar graphs illustrate how patient age, ethnicity, English proficiency and insurance status correlated with whether patients opted to use the online self-scheduling tool for mammogram screenings or the traditional, over-the-phone scheduling method.

formed at an urban quaternary care academic medical center with patient portal access to electronic medical records, included a

tivariable logistic regression to determine

which independent factors were linked to using online self-scheduling for screening mammograms.

Linking Patient Variables to Online Portal Use

Only 302 patients (0.7%) scheduled their mammograms using the online patient portal. Those who scheduled their screenings online were more likely to be younger and have private insurance. They also had higher odds of being white and English-speaking, and residing in zip codes with greater access to broadband internet service.

The researchers did not find any significant links between use of the online self-scheduling tool and education level, having any type of internet access or living in an area with a higher median household income

"These results underscore emerging health disparities in accessing patient portals and telehealth applications among underserved patient populations, and the contribution of health information technology and digital health interventions in widening the digital divide," Dr. Balthazar said.

care," Dr. Balthazar said, telehealth and mobile health interventions can become an additional barrier to care and lead to intervention-generated inequities.

To avoid these problems, new health care technologies should be designed and implemented with equity in mind, Dr. Balthazar asserted. One way to help accomplish this, she said, is to include a digital health navi-

gator as part of the health care team. Community outreach campaigns can also be useful, as can multilingual resources and digital tools written at inclusive health literacy levels.

"Although we have good intentions, if we don't use a health equity lens to evaluate new digital health technologies at the design stage, we may inadvertently cause some harm," she said. "We cannot assume that all patients will benefit equally from an intervention if they

are coming from diverse backgrounds." The poster presentation, "Online Patient Portals Widen Health Disparities In Radiology: Analysis Of Patient Characteristics Of Self-scheduled Online Patient Portal Screening Mammography," (NPM03-A2) will take place on Tuesday, Nov. 30 at 12:15 p.m. Visit the Learning Center or access the poster at Meeting.RSNA.org.

Balthazar

internet access, education level and median Without "tailored, intentional digital household income. Then they used mul-

Radiologists Can Help Ensure All Patients Have Access to Needed Imaging By Nick Klenske

Health disparities based on race and ethnicity are both widespread and pervasive — and radiology is no exception.

To put this into perspective, according to a study published in BMC Health Services Research, the use of imaging varies significantly depending on a patient's race. After reviewing millions of emergency room encounters taking place over the course of 11 years, the study concluded that nonwhite patients were less likely to receive imaging services.



Colwell

How less likely? According to the study, white patients received medical imaging 49% of the time. In comparison, non-white patients received imaging just 41% of the time, with black patients being 21% less likely to receive imaging than their white counterparts.

In other words, the disparity is great.

According to Rebecca Colwell, a medical student at the University of Wisconsin School of Medicine and Public Health, this racial disparity is even more concerning due to the gatekeeper role that diagnostic imaging plays in modern medical practice.

"Without proper imaging, many nonwhite patients are left undiagnosed, which opens the door to further complications and disparities down the road," Colwell said. "For example, not only do minorities often present at later stages of cancer diagnosis, they also suffer from increased mortality from those cancers."

A Roadmap for Addressing Racial Disparity in Radiology

In her digital poster, Colwell summarizes the existing literature on race-based inequities in diagnostic imaging. "Lots of work has been done across a variety of disciplines in medicine, but this work has not been synthesized," she explained. "Our goal was to make a roadmap for future radiology health equity work and, more importantly, make this information easily accessible to researchers."

CONTINUED ON PAGE 10A



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HEALTHLEVEL uncommon insight

Underserved Communities Hit Harder by Pandemic Disruption to Lung Cancer Screening By Mary Henderson

The number of patients undergoing lung cancer screening at a diverse inner-city New York medical center decreased by nearly 30% during the COVID-19 pandemic compared to pre-pandemic levels, according to a poster presented at RSNA 2021.

Maximillian C. Stahl, a medical student at Albert Einstein College of Medicine in New York City, discussed his retrospective chart review of patients enrolled in the lung cancer screening program at Montefiore Medical Center between March of 2019 and March of 2021. Stahl and a team of researchers compared enrollment during two distinct time periods: pre-pandemic from March 28, 2019 to March 21, 2020, and during the pandemic from March 22, 2020 to March 17, 2021.

During the pandemic period, a total of 857 exams were performed, a 29.6% decrease compared to the pre-pandemic period of 1,218 exams. The mean age of all screening participants was 66.9; female enrollees comprised 51.9% of the study group.

Of the screening enrollees, 20.7%/20.3% were white and 42%/36.3% were Hispanic/ Latino in the pre-pandemic and pandemic time periods, respectively. Mr. Stahl said the diversity of this patient population at the Montefiore Medical Center distinguished his study from other research on the effect of the COVID-19 pandemic on lung cancer screening programs, which have been conducted on predominantly white patient populations. "Our patient population in the Bronx is not only diverse and underserved, it had the highest number of hospitalizations and highest death rates within the five NYC boroughs at the peak of the pandemic," Stahl said. "We serve a portion of the U.S. that has been disproportionately affected by COVID."

Volumes Plummet as Pandemic Takes Hold

The center's lung screening volume decreased to its lowest point during the initial New York state lockdown in April and May of 2020, with 14 and 10 exams performed, respectively. Exam volume rebounded in September 2020 to pre-pandemic levels (131 exams), before declining again to 43 per month during the second COVID-19 wave from December 2020 to March 2021. There was no significant difference in Lung-RADS assessment categories scores between the two time periods.

The percentage of exams that were performed on newly enrolled patients during the pandemic also significantly decreased compared to the pre-pandemic period, from 32.7% to 13.8%.

"For a lung cancer screening program to work efficiently, you need to see patients as early as possible so that any lung nodules



Stahl

can be detected when they're most treatable," Stahl said.

The U.S. Preventative Services Task Force guidelines suggest annual lung cancer screening with CT imaging for adults between the ages of 50 and 80 with a 20-year pack history who currently smoke or who have quit in the past 15 years.

Stahl said during the summer of 2020, many of the country's lung cancer screening programs returned to pre-pandemic enroll-

ment numbers. "Our program didn't adjust as well as

others," he said "We weren't able to maintain our prepandemic enrollments during the second wave of the pandemic." He said that as the nation continues to adapt to the pandemic, ongoing

efforts are needed to overcome its impact on underserved communities including improving patient and provider outreach and using information technology to better manage patient data.

View the digital poster, "Bend But Don't Break: Experience Of A Diverse New York City Lung Cancer Screening Program During The COVID-19 Pandemic," (CH03-C1) in the Learning Center or online at *Meeting.RSNA.org.*

Working With Patients Can Help Develop More Effective Lung Cancer Screening Outreach

By Melissa Silverberg

Patients from low socioeconomic status communities experience worse lung cancer outcomes, but communitybased outreach encouraging lung cancer screening can help overcome those gaps and promote trust.

"There is an increasing need for intentional outreach to ensure that everyone who is eligible will benefit from this life saving opportunity," said Efren Flores, MD, assistant professor of radiology at Harvard Medical School and radiologist at Massachusetts General Hospital, both in Boston.

The goal of the project was to work with communities to develop three outreach videos that would

promote lung cancer screening with messaging from either a radiologist, a patient or a patient and radiologist together. Focus groups including those who had gone through lung cancer screening, patients who had not undergone screening, community leaders, primary care physicians and patient advocates worked with the research team to review and revise the video scripts.

Among focus group participants, fear and transportation challenges were listed as common barriers to lung cancer screening. Other patients reported confusion about who is eligible, the lung cancer screening process and insurance coverage.

"We found that people want to get the message from someone they feel they can trust," Dr. Flores said. "Being genuine and authentic is key. It's one thing for the message about quitting smoking to come from the provider, but it means more to hear from someone who has gone through the process."



Flores

The videos also emphasized that lung cancer can be treated more easily when it's detected earlier.

"It is also a message of hope," Dr. Flores said.

Videos Shared With Focus Groups

Once the videos were produced, a national sample of 315 lung cancer screening-eligible, current smokers with Medicaid were randomized to watch one of the three videos and report their satisfaction, intent to

screen and attitudes about lung cancer, Dr. Flores said.

The study showed 67% overall satisfaction with the videos. Participants in the video where the message was delivered by a radiologist reported significantly greater perceptions of information quality, but participants in the video delivered by the patient reported the greatest intent to speak with their primary care physician about lung cancer screening.

"This project exemplified how radiologists can partner with key stakeholders to tailor outreach about lung cancer screening," said Keenae Tiersma, clinical research coordinator at Massachusetts General Hospital. "I particularly enjoyed the mixed methods approach to this project as we had the opportunity to gain in-depth information from individuals and also see how our outreach was received on a larger scale."



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RSNA President Mary C. Mahoney, MD, (center), recognized the RSNA 2021 award recipients at a special luncheon in their honor. From left to right, Outstanding Educator, Adam E. Flanders, MD; Honorary Member, Seung Hyup Kim, MD, PhD; Peter B. Dean, MD, accepting the Margulis Award on behalf of the winning authors; Honorary Members, Boris Brkljavic, MD, PhD, and Harriet C. Thoeny, MD; Outstanding Researcher, Pamela K. Woodard, MD, PhD; and Gold Medalists, Yoshimi Anzai, MD, MPH, Richard L. Ehman, MD, and Jonathan S. Lewin, MD.





James P. Borgstede, MD, (center), immediate-past president, recognized some of the RSNA 2020 award recipients. From left to right, Gold Medalists, Ronald L. Arenson, MD, and William T. Thorwarth Jr., MD, and Honorary Members, Omolola M. Atalabi, MBBS, and Guillermo Elizondo-Riojas, MD, PhD.



The organizing members and presenters at the AI Showcase Theater awards presentation for the winners of the COVID-19 AI Detection Challenge and Brain Tumor AI Challenge.



Attendees are taking advantage of the wide variety of photo ops and selfie stations throughout the halls of RSNA 2021.



Fast 5 Speakers Give Their Take on Redefining Radiology

Moderated by Sherrie S. Wang, MD, this year's Fast 5 presenters addressed some of the hottest topics in radiology, from improving health care access to artificial intelligence and family leave. Each speaker competed for the opportunity to present on a non-clinical topic Monday afternoon on the Arie Crown stage.

By Mary Henderson

Tackling Climate Change from the Reading Room

Julia Schoen, MD, shared her expertise in environmental engineering and her passion for the outdoors with suggestions on how radiologists can help tackle climate change from the reading room.

"Health care is one of the largest polluters in the US, emitting 10% of the country's greenhouse gases," said Dr. Schoen, a diagnostic radiology resident at Atrium Health Wake Forest Baptist.

She said the field of radiology should consider its contribution to carbon emissions. from energy-intensive scanners that waste two-thirds of their total energy usage sitting idle and disposable supplies to lights, heating and cooling and PACS systems that are run constantly.

To develop solutions for making radiology more sustainable, Dr. Schoen invited audience members to join Radiologists for a Sustainable Future (@Rads4SF).

Addressing Imaging Inequality at the Frontline: A Free Imaging Clinic Model for the Underserved

In 2003, the Institute of Medicine reported that minorities receive lower quality health care leading to worse outcomes - a reality that's only been magnified by the COVID-19 pandemic. The myriad barriers to medical imaging include transportation difficulties, financial instability and race-based ordering bias.

As a resident at Emory Radiology, Charlotte Y. Chung, MD, PhD, now a neuroradiology fellow at New York University, along with her colleagues created a local free imaging clinic under the Georgia Volunteer Health Care Program. For the past year, volunteer medical students and technologists have been providing free ultrasound exams to patients in Clarkston, a city 30 miles outside Atlanta known as the 'Ellis Island of the South' for resettling the highest number of refugees per capita in the U.S.

"I hope this demonstrates how a free imaging clinic can be achieved through





your local community.'

Gomez-Cintron provider teamwork and innovations for workflow modifications," Dr. Chung said. "I challenge you to follow our example and propagate the free imaging clinic model in

The Millennial Transformation of Radiology

While some people might think Millennials are lazy based on their preference for work-life balance, Angel Gomez-Cintron, MD, who has been radiology residency director at UT Health San Antonio for the past 13 years, has a different perspective.

"In fact, residents today read four times as many studies as I did when I was a resident," Dr. Gomez-Cintron said. "I believe there is great power in the Millennials' ability to know what they deserve and their ability to set boundaries.3

He said Millennial radiologists look for



Chung



meaning in their work beyond money and want everyone in the workforce to have a fair and honest opportunity to shine.

"Millennials stand up for what they believe is right and they won't tolerate injustice," he said. "I believe they are a force that will change patient care, and one I trust with my own and my patients' medical care."

Embracing AI for Mitigating Health Disparities

Hopes are high for AI and deep learning to aid in the workflow of radiologists, but Noushin Yahyavi, MD, cautioned that algorithms are only as good as the underlying training data.

"For tasks such as the diagnosis of pneumonia on chest radiographs, the ability of deep learning to diagnose disease may approach, and even exceed, the performance of expert radiologists," said Dr. Yahyavi, assistant professor of radiology at the John Hopkins University in Maryland and an MBA candidate at Johns Hopkins Carey Business School.

However, she said a recent study showed deep learning models trained to detect a variety of diseases using gender-imbalanced chest X-ray datasets consistently underperformed on images of the minority gender.

To mitigate bias, Dr. Yahyavi said AI products must be trained on diverse sample sizes with anti-bias algorithms. She also offered examples of AI tools that can help achieve health equity, such as an app that explains imaging exams in different languages and automated appointment

reminders and translators for medical jargon. 'We need to think about opportunities to use AI to help mitigate health disparities," she said.

Supporting Family/Medical Leave: Where Are We, Where Do We Go From Here?

Elizabeth Dibble, MD, spoke to a topic that's been on the minds of many radiologists: family/medical leave.

"There's a rising tide of awareness of the importance of family/medical leave and family friendly policies in radiology including the new ABR residency leave policy and ACR's Resolution 48 for trainees," said Dr. Dibble, an assistant professor of diagnostic imaging at the Warren Alpert Medical School of Brown University.

She said many people don't qualify for a leave through the Family Medical Leave Act (FMLA).

"We really shouldn't rely on federal law to dictate policy," Dr. Dibble said. "We have to ensure that radiology groups have leave policies in place that provide a minimum of 12 weeks of leave for all employees in the group.

With 50% of radiologist leaves taken for personal serious health conditions or to care for an immediate family member, Dr. Dibble said family leave policies will help promote equity, improve retention and protect against burnout for all members of a practice.



Heitzman

Monday Plenary Lecture Dedicated to Heitzman

The Plenary Lecture on Monday was dedicated to the memory of E. Robert Heitzman, MD.

Dr. Heitzman was a former RSNA president and an acclaimed researcher in the anatomy and diseases of the lungs. Dr. Heitzman spent more than 20 years at SUNY Upstate Medical University, Syracuse, NY, where he served as chair and vicechair of the Department of Radiology and director of the Diagnostic Division.

Following his RSNA presidency, Dr. Heitzman served as associate editor and consultant

[Question on Cover]

Tuesday's

A typical screening mammogram is about 0.4 mSv. A single-phase head CT is about 2 mSv, the barium meal is about 4 mSv, and the AP abdominal radiograph is about 0.7 mSv.

to the editor of Radiology. He was instrumental in the founding of the R&E Foundation and served as a Foundation Board of Trustees member and chair. He also chaired the R&E Foundation's Diamond Jubilee Committee.

Dr. Heitzman presented the 1981 RSNA Annual Oration in Diagnostic Radiology and received the RSNA Gold Medal in 1994. Dr. Heitzman was a former president of the American College of Radiology and the Fleischner Society.



Schoen

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INDUSTRY FOCUS

True Neural Network Thinking Defines AI Reconstruction

By Evonne Acevedo

When radiologists look for artificial intelligence (AI) applications to enhance their performance and efficiency, they want more than automation they want a solution that's trained to think.

"Medical imaging continues to evolve to meet the needs of providers who ask for better resolution and shorter scan times with lower dose," said Tom Szostak, Director of Healthcare Economics at Canon Medical Systems USA, Inc. "We've tailored our AI solutions to address those needs by developing powerful applications that can be used on up to 98% of all procedures delivered on our CT, MR and PET CT modalities.

Redefining Radiology means ultimately redefining patient care, Szostak said, and AI itself may be wanting for a clear definition. On Wednesday during RSNA 2021, Canon will host a Virtual Industry Presentation, The State of AI In Radiology Today Roundtable, where industry-recognized experts in the field of AI will discuss current applications in AI and make predictions for how it will be enmeshed in real-world clinical care.

"AI can be confusing to discuss with customers, because every automated solution can be described as AI," Szostak said. "At Canon we define AI to be deep learning or machine learning - your true neural network thinking. Not just an 'if this, then that' statement, but human-like thinking that goes beyond one specific use case.'

For example, Canon's AiCE deep learning reconstruction system can differentiate signal from noise, so that the algorithm can suppress noise while enhancing signal. It's trained with model-based iterative reconstruction (MBIR) to exhibit high spatial resolution - but unlike MBIR, it overcomes



challenges with image appearance or reconstruction speed that can present in a clinical setting.

Canon set out to make these solutions not only meaningful for radiologists, but also accessible for all imaging studies. Rather than offering AI applications as a segmented or "premium" addon, they build the technology into the products. "Our AiCE is available across our entire CT portfolio, so you choose any CT system and you have access to

that technology. Same with MR and digital PET CT," Szostak explained.

Also during RSNA, Canon will unveil its new "Altivity" AI solution. Under the promise of Intelligent healthcare made easy, Altivity enables:

Informed healthcare

Altivity is here to help enhance clinical confidence with high-quality images and applications that help make informed decisions in real-time.

Fast, tailored care

Altivity has been created with patients in mind, to deliver the fast and accurate results they need for a more personalized treatment approach.

Efficient workflows

Altivity helps create simple, streamlined AI-driven workflows that optimize resource deployment and ensure your teams have the insights they need to work smarter every day.

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In the AI Showcase, discover the latest in artificial intelligence (AI), connect with industry experts and see what's happening in the RSNA AI Theater. Experience the Imaging AI in Practice Demonstration featuring AI tools in use in real-world clinical scenarios.

You'll find many focused areas in the Technical Exhibits Halls including the 3D Printing and Mixed Reality Showcase, Recruiters Row and Educators Row. While in Recruiters Row, update your headshot at the RSNA Portrait Studio.

Connect with representatives from educational institutions and medical associations from around the world at Educators Row where you can also meet with RSNA publications staff. Then, head to the First-Time Exhibitor Pavilion to meet with more than 90 annual meeting newcomers.

Our Technical Exhibits Halls feature demonstrations and learning opportunities throughout the day. Learn about radiology's latest innovations in the Innovation Theater. Participate in Corporate Symposiums, attend Vendor Workshops or participate in Lunch & Learns that include panel discussions, demonstrations and lectures.

Don't miss the chance to explore our Virtual Exhibition to connect with exhibitors who were unable to travel to Chicago. All RSNA attendees have access to industry programming and the complete Virtual Exhibition through April 30, 2022. And, visit the Virtual Exhibitor Lounge to learn more about our virtual-only exhibitors.

Learn more about the RSNA 2021 Technical Exhibits at Meeting.RSNA.org.



Canon Medical is proud to present our 2021 RSNA Virtual Exhibit. This one-of-a-kind experience will provide the latest updates on the outcomes driven innovations shared at this year's RSNA. Consistent with our Made for Life Philosopy, we are excited to extend our invitation to meet with Canon Medical experts to those attending RSNA in-person as well as our valued customers that will not be traveling this year.



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tion for each modality, we can assist provid-

"Technology and innovation don't matter ers to deliver more efficient, cost-effective, if you don't have access to them," Szostak high-quality patient-centered care that is safe said. "With the entire product portfolio and meaningful." enabled with an amazing, innovative solu-

Find Canon Medical Systems' virtual booth at *Meeting*.RSNA.org.

Technical Exhibits At-A-Glance

Technical Exhibits Hours

Sunday – Wednesday 10 a.m. – 5 p.m. South Hall A, Level 3 North Hall B, Level 3

AI Showcase

South Hall A, Level 3 (starting at Booth 4129)

3D Printing & Mixed Reality Showcase

North Hall, Level 3 (starting at Booth 8100) Imaging AI in Practice Demonstration South Hall, within the Al Showcase Booth 4529

Virtual Exhibitor Lounge South Hall A, Level 3, Booth 4112

RSNA AI Theater Presentations

South Hall, Booth 5147 Sunday – Wednesday 10:30 a.m. - 3:45 p.m.

Innovation Theater Presentations South Hall, Level 3, Booth 4108 Monday and Tuesday 10:30 a.m. - 3:45 p.m.

Vendor Workshops, Lunch and Learns and Corporate Symposiums See Meeting Program for schedules

Virtual Exhibition and Virtual Industry Presentations See Meeting Program for schedules

Dining:

RSNA Bistro South Hall and North Hall Sunday – Wednesday Buffet lunch served 11 a.m. – 2:30 p.m.





Study Supports Discontinuation of Patient Shielding in Pediatric Digital Radiography

By Jennie McKee

Research has long suggested that routine patient shielding during digital radiography provides negligible benefits to patients – and, in fact, that it presents substantial risks, as shielding can lead to patient motion or artifacts, thus necessitating repeat exams. For these reasons, the American Association of Physicists in Medicine (AAPM) as well as other professional societies have recommended that technologists should no longer routinely use patient shields.

"In October 2020, our institution implemented the recommendation of the AAPM and other professional societies to eliminate the routine use of patient shields for radiography," said Cynthia K. Rigsby, MD, pediatric radiologist and chair of medical imaging at Ann & Robert H. Lurie Children's Hospital of Chicago.

Dr. Rigsby and her fellow researcher, Jan Pachon, MS, medical physicist at Ann & Robert H. Lurie Children's Hospital of Chicago, conducted a study to assess how this change in practice impacted clinical repeat rates and speed of service of pediatric digital radiography at their institution.

The goal of this work was to determine whether risk of repeat exposures had significantly decreased without patient shields as hypothesized, and if implementing this practice had created delays in speed of service through questions related to shielding.

Discontinuing Routine Shielding and Gathering Data

Over the course of 19 months, the researchers documented clinical repeat rates (RRs) and reasons for repeating pediatric digital

radiographs. Routine patient shielding was used for the first 12 months, but not for the last seven months.

To help facilitate this change, a public awareness campaign was created using social media, posters, flyers and other means to educate patients and staff about the rationale for discontinuing shielding.

The researchers documented shielding-related repeats as artifacts or patient motion whenever a shield

negatively affected exam quality. They compared the RRs of these reasons for repeat radiographs with and without the use of routine shielding for pelvis and abdomen exams

Rigsby

Dr. Rigsby and Pachon also assessed the time elapsed between the exam time stamped into the radiology information system and the time when the image became available on the picture archiving and communication system during the 12 months

right diagnostic exam. "Achieving this

goal requires us to be open to collaborat-

ing with health care teams in other fields

that will decrease these disparities," she

said. "We also need to advocate for posi-

To help radiology achieve this goal,

tive change within our own spheres of

Colwell is currently studying clinical

topics of relevance to under-represented

populations, working to link imaging dis-

parities to health outcomes, and exploring

strategies to mitigate disparities and pro-

mote an equitable health care system.

Visit the Learning Center for the

the use of Diagnostic Imaging: A Sys-

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poster presentation, "Racial Inequities in

tematic Review," (NPM03-C1) that will take place on Tuesday, Nov. 30, at 4 p.m.

and to implementing system changes

CONTINUED FROM PAGE 4

Radiologists Can Help Ensure All Patients Have Access to Needed Imaging

influence.3

The hope is that radiologists use this roadmap to better address issues of racial disparity in medicine. "Radiologists can help mitigate disparities they encounter by identifying the causative factors within their health system," Colwell explained. "They can also educate other providers on ordering protocols to maximize appropriate imaging for patients."

Colwell also noted that radiologists are well-positioned to develop strategies for mitigating health disparities through the thoughtful application of radiologic technology. This includes utilizing electronic medical records and demographic data to identify individuals at an increased risk of missing screenings or who have missed follow-up imaging. Targeted outreach can then be offered to avoid these missed opportunities for care.

Collaborating for a More Equitable Health Care System

According to Colwell, the end goal is to ensure that all patients have access to the

Tuesday's nysics Tip

The fetal dose delivered during a standard screening mammogram is negligible (< 0.01 mSv).



routinely used and seven months after the discontinuation of patient shields. **Analyzing Results**

when patient shielding was

The average RR of digital radiographs due to patient motion with routine shielding was 10.06% and 7.7% due to artifacts. After discontinuing shielding, the average patient motion-related RR was 7.43% and 5.84% from artifacts.

"We found the overall repeat rate without routine patient shielding to be significantly lower (p < 0.05) than when shielding was routinely used," Pachon said. "This is particularly true for abdomen and pelvis exams where patient motion can cause the shield to move and obscure anatomy."

The researchers found only negligible differences when they assessed speed of service before and after discontinuation of shielding.

CONTINUED FROM PAGE 5

A comparison of repeat rate (RR) for abdomen and pelvis exams shows a decrease in motion related repeats of ~9% and ~1.8% for abdomen and pelvis exams, respectively, after the discontinuation of shielding. There were no statistical differences in artifact related repeat rate when shielding was not used (p>0.05).

well-thought-out awareness campaign, an age-old practice can be changed, and quality and patient safety can be improved," Pachon said.

The poster presentation, "Impact of Patient Shielding Discontinuation on Repeat Digital Radiography," (PD05-A2) will take place on Thursday, Dec. 2 at 12:15 p.m. Visit the Learning Center or access the poster at Meeting.RSNA.org.

"There is not a one size fits all approach.

form healthcare delivery, raise

awareness, and achieve meaning-

ful change in disparities in health

equity," he said. "Health equity is

Access the presentation,

If we partner with our patients and other

members of the community, we can trans-

everyone's responsibility."

Working With Patients Can Help Develop More Effective Lung **Cancer Screening Outreach**

"Our methods can be adapted to different populations and settings, which opens exciting opportunities to continue working to

promote screening equity among underserved communities," Tiersma said. "As someone just beginning in the medical field, I look forward to building on this work to advance health equity in radiology."

Dr. Flores grew up in Puerto Rico and said he watched a relative die from lung cancer who was not able to access adequate healthcare, which has inspired his

work to ensure all patients receive the best care possible.

UNIK is our comprehensive portfolio of products, solutions and services in diagnostic imaging.





Rates and Speed of Service in Pediatric





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