



# Daily Bulletin

ONLINE AT [RSNA.ORG/BULLETIN](https://www.rsna.org/bulletin)

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## EXCLUSIVE ONLINE CONTENT

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Get More  
**Daily Bulletin**  
Online

## Transforming Health Care By Empowering Patients With Insights Into Their Health

By Nick Klenske

*In his Tuesday plenary lecture, Vin Gupta, MD, highlighted how two companies are transforming everyday household items—in this case, a mirror and a toilet seat—into high-tech diagnostic tools.*

“Device-centric health care is a potential vision for how we can deliver patient care in the future,” said Dr. Gupta, a practicing pulmonologist who currently serves as chief medical officer of Amazon Pharmacy.

Whereas the mirror uses remote photoplethysmography and the toilet seat uses sensor and EKG technology, both devices can accurately monitor vitals, such as blood pressure.

“These devices demonstrate how we can seamlessly integrate vital sign checkups into a patient’s routine activities,” Dr. Gupta said.

### Improving Patient Engagement Starts at Home

To add some perspective on why such integration is important, consider that one in two American adults lack access to same-day care.

“Moving some diagnostics into the home setting could help reduce the gap between testing and treatment,” Dr. Gupta explained.

Furthermore, by integrating vital sign testing into everyday activities like brushing your teeth or going to the bathroom, patients will be more likely to

use the technology.

“The bottom line is patients don’t like our current diagnostic tools,” explained Dr. Gupta,

CONTINUED ON PAGE 10



Gupta

## Tuesday Plenary Session Dedicated to Hattery

*The Plenary Session on Tuesday was dedicated to the memory of Robert R. Hattery, MD.*

RSNA Past President **Robert R. Hattery, MD**, was a distinguished scholar and strong advocate for all radiologists.

Dr. Hattery received his medical degree, specializing in radiology, from Indiana University in Indianapolis and later completed his radiology residency at Mayo Clinic in Rochester, MN. There his career progressed, and he was later appointed chair of the Department of Diagnostic Radiology. In 1994, Dr. Hattery was named chairman of the Mayo Clinic board of governors. After retiring from Mayo Clinic in 1998, Dr. Hattery served as the executive director of the American Board of Radiology until 2007.

A prolific author and a globally sought-after lecturer, who is remembered by his colleagues as a well-balanced, powerful leader with a welcoming nature, Dr. Hattery was a past president of the Society of Computed Body Tomography, the Society of Uroradiology and the American Board of Radiology. He received gold medals from the Minnesota Radiological Society, the American Roentgen Ray Society and the Society of Uroradiology.

Dr. Hattery was a longtime supporter of the RSNA R&E Foundation. He served on the RSNA Board of Directors and rose to the position of president in 2006. He was awarded the RSNA Gold Medal in 2011.



Hattery

## Langlotz Named RSNA President

*Curtis P. Langlotz, MD, PhD, is president of RSNA.*

A renowned imaging informatics leader and committed advocate for improved clinical communication, Dr. Langlotz is professor of radiology, medicine and biomedical data science, director of the Center for Artificial Intelligence in Medicine and Imaging, and associate chair for information systems in the Department of Radiology at Stanford University in California. He is also associate director and senior fellow at the Institute for Human-Centered Artificial Intelligence at Stanford. As a medical informatics director for Stanford Health Care, Dr. Langlotz sets strategy for the computer technology that supports the Stanford Radiology practice.

Dr. Langlotz received his medical degree, a master’s degree in AI and a doctorate in medical information science from Stanford University. He completed an internship and radiology residency at the University of Pennsylvania, where he remained on the faculty for 20 years. He accepted his current position at Stanford in 2014.

A longtime RSNA member, Dr. Langlotz served for many years on RSNA’s Radiology Informatics Committee and has served the Society as an informatics advisor. He led the development of numerous RSNA informatics initiatives, including



Langlotz

CONTINUED ON PAGE 10

# Wednesday At a Glance

## Plenary Session

**Julius Chapiro, MD, PhD, and Anna Shapiro, MD**  
**11 a.m. - Noon | Arie Crown Theater**

*Oncology Imaging and Interventions: The Radiology Jeopardy*  
 Join the fun and challenge yourself as teams of leading experts compete to solve tricky cases.



Chapiro



Shapiro

## Plenary Session

**Jocelyn D. Chertoff, MD, MS**  
**1:30 - 2:30 p.m. | E450A**



Chertoff

*Understanding and Revitalizing the Radiology Workforce*  
 Dr. Chertoff will discuss the current challenges in managing and understanding the radiology workforce in today's environment, and how radiologists can effectively navigate the changes and create strategies for a successful future.



8 a.m. - 9 a.m.

**Science and Education Sessions**

9 a.m. - 9:30 a.m.

**Poster Discussions**

Learning Center

9 a.m. - 9:45 a.m.

**RSNA Connect: Sustainability Connections Center**

9 a.m. - 3 p.m.

**Learning Center Theater Presentations**

Learning Center Theater

9 a.m. - 3:15 p.m.

**Technical Exhibits Industry Presentations**

9:30 a.m. - 10:30 a.m.

**Science and Education Sessions**

10 a.m. - 5 p.m.

**Professional Portrait Studio**

South Hall, Booth 1031

10:30 a.m. - 2:15 p.m.

**RSNA AI Theater Presentations**

South Hall, Both 5149

12:15 - 1:15 p.m.

**Poster Discussions**

Learning Center

1 - 2 p.m.

**Meet the RSNA Journal Editor: Linda Moy, MD**

*Radiology*

South Hall, Booth 1007

1:30 p.m. - 2 p.m.

**Radiology: Imaging Cancer – Perspectives from the Trainee Editorial Board**

Discovery Theater

1:30 p.m. - 2:30 p.m.

**Science and Education Sessions**

2:45 - 3 p.m.

**Introducing RSNA EdCentral**

Discovery Theater

3 p.m. - 5:30 p.m.

**Science and Education Sessions**

4 p.m. - 5 p.m.

**Radiology AI Fireside Chat**

AI Showcase, South Hall, Level 3

9 p.m. - Midnight

**RSNA After Dark**

Tao Chicago

View the full program and add sessions to My Agenda on the RSNA 2023 App or at [Meeting.RSNA.org](https://Meeting.RSNA.org).

# Daily Bulletin

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 The RSNA 2023 *Daily Bulletin* is the official publication of the 109th Scientific Assembly and Annual Meeting of the Radiological Society of North America. Published Sunday, November 26–Thursday, November 30.

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The RSNA 2023 *Daily Bulletin* is owned and published by the Radiological Society of North America, Inc., 820 Jorie Blvd., Suite 200, Oak Brook, IL 60523.



## Community Service Event at RSNA 2023 Generates Warmth and Joy For Those In Need

*In response to the pressing needs of the unhoused community in Chicago during the winter months, a group of attendee volunteers participated in a community service activity on Tuesday.*

RSNA's Health Equity Committee coordinated the activity to support two Chicago-based organizations, Care for Friends and Sarah's Circle, that serve the unhoused.

Committee members and attendee volunteers worked diligently to assemble cold weather and hygiene kits. The cold weather kits included items such as socks, gloves and hand/feet warmers and the hygiene kits included toothbrushes, toothpaste and body wash. Each kit was packed in a durable, reusable tote bag.

Each bag included a personal note from one of the participants with words of encouragement and kindness.

Participants enjoyed several hours of camaraderie and compassion as they united in their shared commitment to make a positive, inclusive impact on the lives of the unhoused population in Chicago.



## Awards Posted in Learning Center

*Visit the Learning Center to see the RSNA 2023 award-winning education exhibits and quality improvement reports. Recognized items are noted with a ribbon.*

While you're in the Learning Center, check out the more than 3,000 education exhibits, scientific digital posters and quality improvement reports featuring the latest in radiology innovation and research.

Share your favorite poster, education exhibit or quality improvement report over social media using #RSNA23.

# Use of Photon-Counting CT Increases Reader Agreement of Pancreatic Cancer Resectability

By Nick Klenske

*With limited treatment options, pancreatic cancer is the fourth most common cause of cancer-related death among American men and women. In fact, the only potentially curative treatment available is margin-negative surgical resection.*

However, not all pancreatic cancer tumors are resectable, and failure to pre-operatively determine if a tumor is unresectable can result in morbidity and mortality.

The key to making such a determination is abdominal imaging, with the National Comprehensive Cancer Network recommending thin section pancreas protocol CT for preoperative staging.

“A pre-operative pancreas protocol CT scan has long been the best-validated imaging modality for staging and resection planning—at least for now,” said Jesi Kim, MD, a radiology resident at NYU Langone Health in New York.

According to Dr. Kim, photon-counting CT (PCCT), which is becoming increasingly commonplace in clinical practice, allows for improved spatial resolution without a dose penalty compared to conventional CT. It also has the advantage of a superior iodine contrast-to-noise ratio.

But do these advantages translate to a better assessment of pancreatic cancer resectability?

That’s what a new study conducted by the NYU Langone Department of Radiology intended to find out.

“Accurate and consistent resectability assessment across multiple readers is critical for presurgical planning,” said Dr. Kim, the study’s lead author. “As photon counting CT was recently introduced into clinical practice, it is important to compare it with conventional CT.”

## Comparing Inter-Reader Agreement of PCCT And EID CT

The study, which Dr. Kim presented during a Tuesday session, compared the diagnostic performance and inter-reader agreement of resectability of pancreatic adenocarcinoma using a PCCT with that of a 128-slice conventional energy-integrating detector CT (EID CT).

During the study, patients with pancreatic adenocarcinoma underwent pancreas protocol CT with either PCCT (67 patients) or EID CT (66 patients). Out of those patients, 38 had surgery immediately following the index scan.

Two abdominal radiologists assessed the degree of tumor involvement of the celiac artery, common hepatic artery, superior mesenteric artery (SMA), superior mesenteric vein (SMV) and main portal vein

(MPV)—all of which serve as reliable CT indicators of unresectability.

The readers then classified tumor resectability as being either resectable, borderline resectable, locally advanced and unresectable, or unresectable metastatic.

## PCCT Improved Diagnostic Accuracy

What researchers found was that the use of PCCT substantially increased inter-reader agreement.

“There was a substantial increase in inter-reader agreement for three of the major vessels we assessed—celiac artery, SMA and SMV—with the photon counting CT scans compared to the conventional EID CT scans,” Dr. Kim said.

Furthermore, the use of PCCT resulted in a substantial increase in reader agreement as to the presence of metastasis.

Researchers also found that PCCT improved diagnostic accuracy for MPV and SMA involvement and increased a radiolo-



Kim

gist’s diagnostic confidence. More so, all these improvements were achieved at lower patient radiation exposure.

“This study shows that PCCT’s improved spatial resolution and better iodine contrast to noise ratio does in fact translate into improved inter-reader agreement for certain vessel involvement and the detection of metastasis,” Dr. Kim concluded.

“These advantages also improve the diagnostic accuracy of pancreatic adenocarcinoma resectability and decrease radiation exposure compared to conventional CT.”

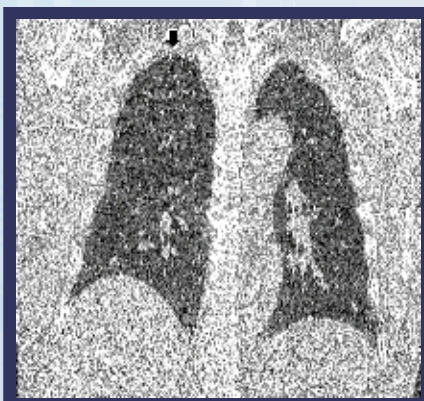
Access the presentation, “Inter-reader Agreement and Diagnostic Performance of Pancreatic Adenocarcinoma Resectability Assessment with Photon Counting CT Compared with Conventional Energy Integrating Detector CT,” (T1-SSGI08-2) on demand at [Meeting.RSNA.org](https://www.rsna.org)

## Clari $\pi$ Pioneers AI for Imaging Safety Population Health Opportunistic Screening

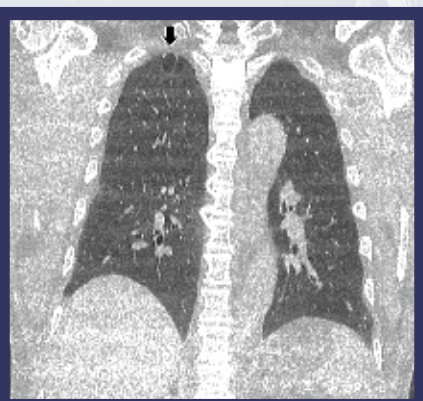
### ClariCT.AI Superb AI-Powered CT Denoising Solution

The Future is Now, Innovation is Yours Ready for Photon-Counting CT

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AI Theater: Tues., Nov. 28th, 1:30pm

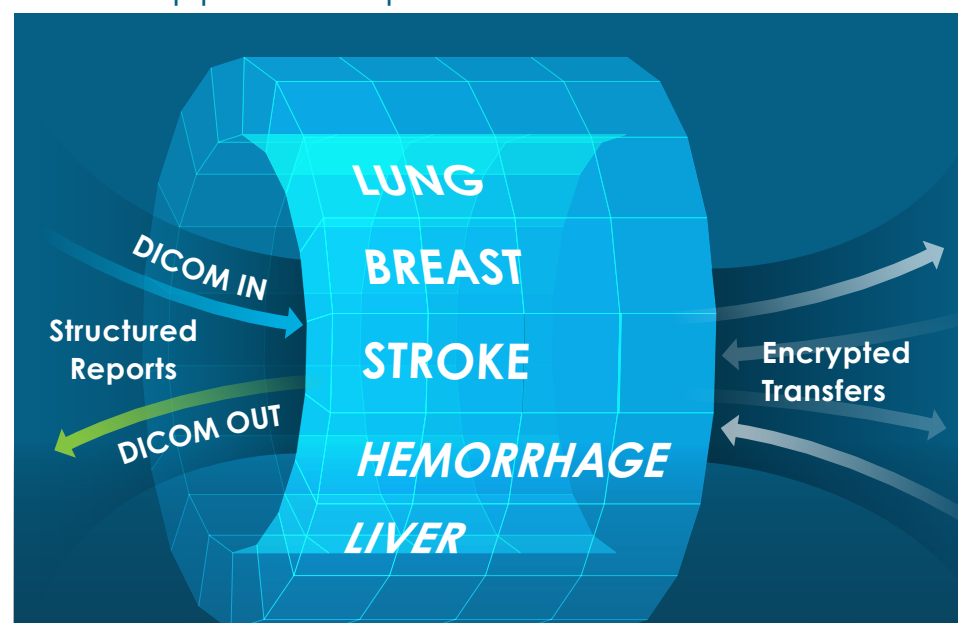
“Could DL-Based CT Denoising Further Improve Image Quality of PCD-CT?: An Experience at Tübingen University Hospital”

Booth: #4147, South Hall, AI Showcase



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RSNA BOOTH 7307

# Assessing Skeletal Maturation Through Elbow Bone Age

By Melissa Silverberg

*Accurate bone age evaluation in pediatric patients is crucial for assessing skeletal maturation, but traditional methods looking at hand bones can have limitations in patients going through puberty.*

Research presented at a Tuesday session proposed a more precise and feasible elbow bone age classification and used a deep-learning AI model for bone evaluation.

Accurate bone age assessment is important for various clinical conditions as it represents skeletal maturity, which can differ from chronological age. In puberty, children undergo remarkable physical changes and growth spurts.

“Our research introduces a newly revised elbow bone age evaluation method using the olecranon apophysis, along with an AI model for puberty. Since hand bone age shows limitations in puberty, elbow bone age can be a useful alternative,” said Gayoung Choi, MD, PhD, radiologist at Korea University in Seoul. “We believe that the findings of this research are of significant importance to the pubertal bone age evaluation and will contribute valuable insights into the accurate and practical elbow bone age evaluation for puberty,



Choi

along with rapidly developing AI-assisted bone age assessment.”

## Simpler And Cost-Effective For Patients

The study included 3,508 lateral elbow radiographs of patients under the age of 18 that were reviewed and classified based on the morphological changes of the olecranon, or the bony prominence of the elbow.

These were then compared with previously established elbow bone age methods (Sauvegrain and Dimeglio) and hand and wrist bone age methods and charts (Greulich and Pyle method and the Korean standard bone age chart). The deep-learning-based model for olecranon bone age classification was trained, validated, tested and further improved through external validation. Two pediatric radiologists then provided interobserver review.

Overall, the deep-learning based model showed a 96% accuracy and a 98% specificity. There was excellent reliability with both Sauvegrain and Dimeglio methods for girls and boys (ICC 0.97 and 0.98 in girls,

0.96 and 0.98 in boys each), and good reliability with hand and wrist bone age by both GP method (0.78 in girls, 0.84 in boys) and KS chart (0.87 in girls, 0.89 in boys).

The accurate diagnosis of the onset of puberty and its progression is crucial for various pediatric conditions related to skeletal maturation, Dr. Choi commented.

“This new method using olecranon apophysis showed excellent reliability with existing bone age evaluation methods and almost perfect interobserver agreement between two specialized pediatric radiologists, while requiring only a single lateral elbow radiograph,” Dr. Choi said.

Although elbow age has been less widely used than hand bone age, Dr. Choi said the hope is that this revised categorization of the olecranon ossification process and AI model could help with accurate pubertal bone age evaluation and inspire further exploration.

Relying on an elbow radiograph rather than the more in-depth procedures for hand bone analysis could also make the process simpler, less expensive and more cost effective for patients.

“Bone age is an important pediatric biological age that represents skeletal maturity

and may differ from chronological age,” Dr. Choi said. “Accurate assessment of bone maturity is important for diagnosis and planning treatment for various conditions. This novel approach shows excellent reliability and can improve the process for our patients.”

Access the presentation, “A Simple and Practical Elbow Bone Age Evaluation Using Olecranon Apophysis in Puberty and Development of a Deep-Learning Model,” (T1-SSPD03-3) on demand at *Meeting.RSNA.org*.



## Physics Quiz

Q

Can the CT scanner table cause artifacts in patient images?  
[Answer on page 8.]

# Assessing the Environmental Impact of Radiology and Radiation Oncology

By Lynn Antonopoulos

Understanding the environmental footprint of radiology and radiation oncology may help clinicians, hospital administrators and policy-makers reach environmentally sensitive decisions.

“Implementing energy-efficient practices could significantly reduce operational costs in health care facilities,” said Shakthi Kumaran Ramasamy, MD, a postdoctoral research fellow in the Department of Radiology at Stanford University School of Medicine in California. “This cost savings could then be redirected to enhance patient care and invest in advanced medical technologies, potentially improving the quality of patient care and outcomes.”

To shed light on the environmental impact of radiology and radiation oncology equipment, Dr. Ramasamy sought to quantify the global energy consumption of these essential health care devices. He gathered and consolidated data from a broad range of sources, including the World Health Organization, the Organization for Economic Co-operation and Development, and regional health databases, to estimate global distribution and types of devices in use in 30 countries.

This estimate considered the number of CT scanners, MRI units, mammography machines and radiotherapy equipment per one million inhabitants. Dr. Ramasamy obtained energy consumption metrics and estimated usage hours from manufactur-



Ramasamy

ers and through scientific literature.

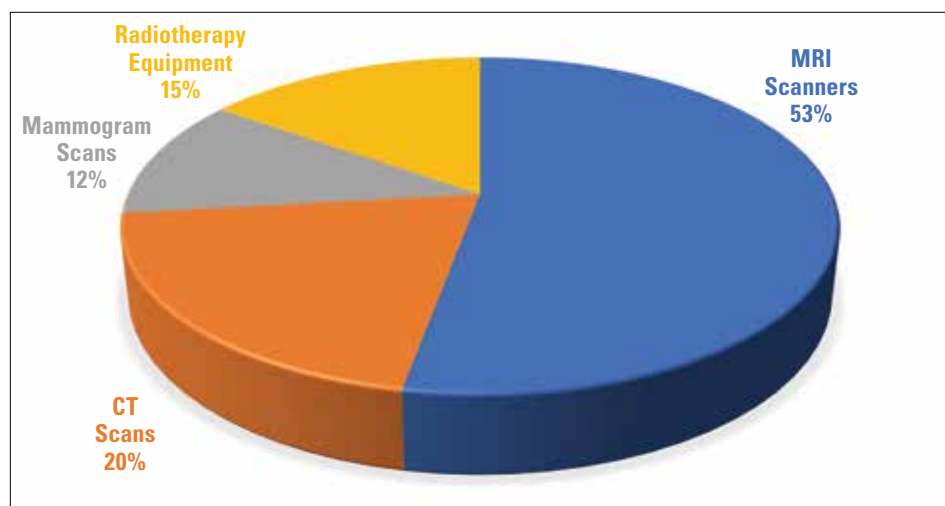
“One major setback in this study was gathering relevant information for this global estimate, as there are no established guidelines on how to approach this task,” Dr. Ramasamy said. “Surprisingly, I found a lack of published literature on the topic during my background research. Additionally, data availability was a significant issue, particularly because information about radiology equipment in some countries is not readily accessible or does not exist.”

## Energy-Efficient Equipment, Schedule Optimization Key to Mitigation

Dr. Ramasamy estimated that the combined total number of CT and MRI exams from 30 countries is approximately 278 million exams annually. “Collectively, these exams consume an estimated 2308.65 million kilowatt-hours of energy per year,” Dr. Ramasamy said. “MRI scanners emerged as the dominant contributors to the total energy consumption.”

The research highlights the substantial energy consumption of these machines and the need to develop strategies to mitigate their environmental impact. These may include procuring energy-efficient machines, optimizing usage schedules and endorsing renewable energy sources.

“The total CO<sub>2</sub> emissions from the power consumption of CT and MRI exams



Pie chart representing the percentage of estimated yearly power consumption for each modality, including CT, MRI and mammography exams across 30 countries, as well as global radiotherapy equipment.

and mammography exams across 30 countries and global radiotherapy equipment amount to approximately 1,419,784 tons of CO<sub>2</sub>,” Dr. Ramasamy said. “This is roughly the equivalent of between 417,261 and nearly 1.5 million long-haul airline flights, depending on the specific flight and calculation parameters used.”

Dr. Ramasamy emphasized the critical role of energy management in medical equipment, with a particular focus on MRI machines. “About 25% to 40% of the total energy consumption of these machines occurs during idle periods, mainly at night and on weekends,” he said. “This indicates that active scanning accounts for less than half of their total energy usage, highlighting a significant opportunity for energy-

saving strategies in health care facilities.”

Additionally, Dr. Ramasamy said that these efforts could contribute to wider environmental sustainability goals and meet the increased demand from patients and the public for environmentally responsible health care practices. “This could lead to a paradigm shift in health care operations, integrating sustainability as a fundamental aspect of clinical decision-making and health care management,” he said.

Access the presentation, “A Global Assessment of Energy Consumption in Radiology and Radiation Oncology: An Environmental Impact Study,” (T3-STCE1-3) on demand at *Meeting.RSNA.org*.



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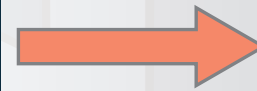


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Standard X-ray Image(Input data)

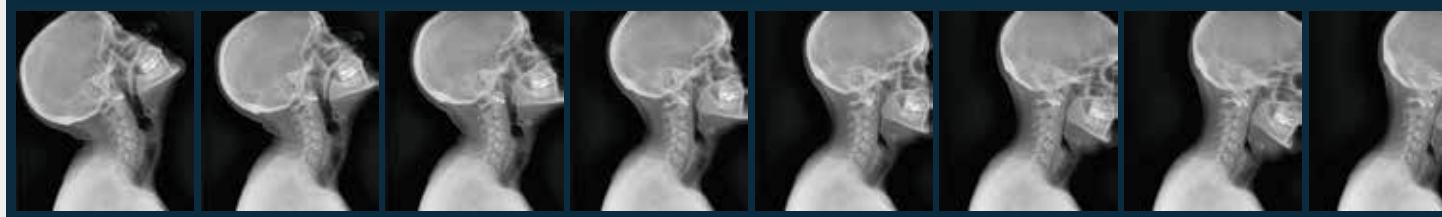


Output: Heat map superimposed image

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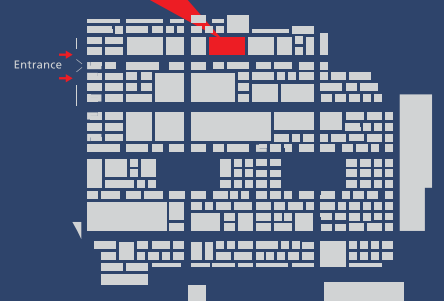
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## Celebrating the RSNA Community



R&E Foundation donors relax and celebrate at a merry Monday reception.



Attendees build community as they make connections through good conversations.



During the Corporate Donor Reception on Monday, R&E Foundation Board of Trustees Chair Satoshi Minoshima, MD, PhD, (left) recognized the Foundation's valuable industry partners, an important part of the RSNA community.



Top finishers in the women's division were (left to right) Hanna Holmstrand (bronze), Georgina Adam (gold) and Claudia Weidekamm (silver).



In the men's division, the medals went to (left to right) Romain Labas (bronze), Grant MacKinnon (gold) and Hakon Hjemly (silver).



A large crowd of runners braved the frigid Tuesday morning to participate in the RSNA 5k Fun Run in support of the R&E Foundation.

# Imaging To Determine Tumor Response in Biliary Tract Cancer

By Mary Henderson

During a Tuesday morning science session in the Learning Center Theater, Christian Reinert, MD, reported on the role of whole-body imaging in assessing the response of patients with cholangiocarcinoma (CAC) to molecular targeted therapy.

CAC, or cancer of the biliary tract, is relatively common, accounting for up to 15% of all primary liver cancers worldwide. The treatment remains challenging, both in patients who are candidates for surgery and those undergoing systemic treatment. The five-year overall survival is 7-20%. Because almost 40% of all CAC harbors actionable genetic alterations, genetic testing is recommended.

“Traditional chemotherapy was the standard treatment of CAC until the gemcitabine-cisplatin and immune checkpoint inhibitors,” said Dr. Reinert, a radiologist at University Hospital Tübingen in Germany. “These treatment options are very expensive so it’s important to analyze the patient’s early response, including complications, with follow-up imaging.”

*“The personalized cancer treatment shows potential for disease stabilization and maintained progression-free survival despite a trend toward more advanced tumor stages. Standardized whole-body imaging is essential for assessing the tumor response of new targeted therapies.”*

Christian Reinert, MD

Dr. Reinert’s study investigated the imaging response of patients with CAC to personalized evidence-based treatment recommendations from molecular tumor boards at two tertiary comprehensive cancer centers in Germany.

“Molecular treatment boards propose evidence-based treatment recommendations in patients with advanced tumor stages when standard of care options have been exhausted,” he said. “Imaging serves to characterize the disease response to treatment.”

## Molecular Tumor Boards Can Identify Aggressive Disease and Plan Treatment

The study included patients who were referred to the molec-

ular tumor boards between May 2019 and September 2021, based on their medical history and prior molecular diagnostics. After diagnostic analyses, patients received individual treatment and follow-up recommendations.

Of the 583 patients referred to the molecular tumor boards, 35 had CAC (18 females, median age 60.2 years). Of these

patients, 28 received treatment recommendations including 15 that received molecular targeted therapy.

Imaging follow-up data were available for 27 patients: 22 underwent CT, 5 had 18F-FDG-PET/CT, and one had MRI.

Standardized response assessment was evaluated using the RECIST guidelines (version 1.1) tool. Two patients achieved an objective response: one with a partial response to pemigatinib, an anti-cancer medication used for the treatment of bile duct cancer, and one with tumor vaccination.

“The personalized cancer treatment

shows potential for disease stabilization and maintained progression-free survival despite a trend toward more advanced tumor stages,” he said. “Standardized whole-body imaging is essential for assessing the tumor response of



Reinert

new targeted therapies.”

Dr. Reinert said his long-term goal is to identify imaging markers that are predictive of therapy response and disease progression. His research will require more patients for further analyses of patterns of therapy responses.

Access the presentation, “Genomic-Based Personalized Therapies and Precision Imaging in Cholangiocarcinoma Patients: A Study at Two German Comprehensive Cancer Centers,” (T3-STCE2-3) on demand at [Meeting.RSNA.org](https://www.rsna.org).

## Answer

American Association of  
Physicists in Medicine

A

[Question on page 4.]

Although it typically does not alter the beam enough to cause strong artifacts, the table does block radiation and harden the beam. The impact on image quality is most often seen in head CT when the dedicated head holder is not used or is used incorrectly.

# Identifying And Mitigating Aggressive Behavior Among Female Physicians

By Mary Henderson

Ami Gokli, MD, MSED, reported on a little-studied workplace behavior known as female-to-female, aggression among physicians in a Tuesday afternoon session.

This type of aggression occurs when a woman with higher power status exerts behavior in a way that is intended to degrade or undermine a woman with less power status. The perpetrators may or may not be aware of how their behavior affects others.

“This type of aggression has been studied in other health care settings, but it hasn’t received much attention among physicians,” said Dr. Gokli, division chief of pediatric radiology at Staten Island University Hospital in New York.



Gokli

## Survey Highlights Need For Awareness

After learning that several colleagues had experienced this type of aggression, Dr. Gokli and her co-researchers adapted a validated survey used in a nursing setting and sent it to 1,694 members of the Society for Pediatric Radiology.

Of 199 respondents (12% response rate), 73% were female and 0.5% were non-binary. The age of respondents ranged from 25 to 66 and included radiologists in training to physicians with 21+ years of experience.

“The majority of respondents said they had witnessed female-to-female aggres-

sion,” Dr. Gokli said. “Forty-seven percent said they had personally been the recipient of this behavior.”

The researchers were especially struck by the number of physicians who admitted perpetrating this: more than 600 (36%) of the respondents.

On a positive note, 68% of the respondents thought this type of aggression was limited to a small group of individuals. However, 39% reported that it was a cause of stress and tension for them in the workplace. And for women on the receiving end, the consequences were significant: 46% reported that it had changed or affected their career path.

“When asked about the possible causes for female-to-female aggression, respondents reported jealousy, insecurity and personality clashes,” Dr. Gokli said.

Both male and female respondents said they were hesitant to report this type of behavior for fear of retaliation or being perceived as a person with ‘issues.’ Dr. Gokli theorized that the behavior is the product of inequality.

“The women who have experienced gender bias, particularly in a male-dominated field, individuate from other women and even begin to apply the same gender stereotypes to female subordinates,” she said.

## Addressing Concerns Requires Teamwork And Mentorship

Dr. Gokli offered several steps to take to begin to create change in the workplace.

“We can’t control other people’s behavior; we can only control ourselves,” she said. “If you see a woman struggling at work, don’t judge them. Ask if you can help through mentorship or creating opportunities for them.”

Dr. Gokli stressed the importance of amplifying other women by giving them credit for their work and reinforcing their ideas in meetings and public arenas. She

also suggested joining or creating a women’s forum where women can talk to each other.

“I want to promote positive conversations, not necessarily around female misbehavior, but about the obligations that women have to one another and how both men and women can work to instill change,” she said.

Access the presentation, “Pink on Pink Aggression,” (T7-SSNPM02-01) on demand at [Meeting.RSNA.org](https://www.rsna.org).

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Unleashing the 5nm potential.



# AI Helps Detect Heart Disease Signs on Mammography

By Richard Dargan

*An AI-based model can identify women at risk for heart disease on mammography, potentially speeding lifesaving interventions, according to research presented Tuesday.*

Calcium deposits in the breast arteries have been linked with medium and large vessel atherosclerosis, which can lead to heart disease. Women with breast arterial calcification are 51% more likely to develop heart disease than those without the condition, according to study lead author Chirag R. Parghi, MD, MBA, chief medical officer at Solis Mammography.

“Women are being diagnosed with heart attacks at an unprecedented rate, particularly young women,” Dr. Parghi said. “We poorly understand who is going to get heart disease in women.”

By detecting breast artery calcification, mammographic screening for breast cancer represents a largely untapped opportunity for early detection of heart disease.

Dr. Parghi and colleagues developed a deep learning AI algorithm trained on an internal dataset of 2D mammograms to detect breast arterial calcification. The algorithm provides an assessment score of 0 to 5 for breast arterial calcification according to the total area of breast arterial calcification and its density.

The researchers validated and tested the algorithm’s accuracy in a large screening population of 15,000 women across 15 screening sites.

### Breast Arterial Calcification Incidence Increases With Age

The AI algorithm demonstrated high accuracy in breast arterial calcification detection. As expected, it showed that a prevalence and distribution of breast arterial calcification increased with age in a screening population. Prevalence rose from 4% in women less than 50 years old to 40.8% in women ages 70 or older. The overall prevalence of breast arterial calcification detected by the AI algorithm was 14.8%.

“We have an opportunity to inform these patients

*“As we continue to focus on how we lead through change, we need to change the way we think about incidental findings. Are they really incidental findings or are they opportunities to inform patients about their unique opportunities to intervene early? We talk about early detection for breast cancer, maybe we need to think about early detection for other diseases.”*

**Chirag R. Parghi, MD, MBA**

that they have a finding that may require additional cardiovascular surveillance,” Dr. Parghi said. “At Solis, we’re going to do over a million mammograms this year. That’s over 150,000 women who can be seen by a cardiologist.”

With traditional reporting, patients often are not informed about any breast arterial calcification, Dr. Parghi said. But with the AI overlay, the patient can be notified during the mammography visit.

“Women obtaining a screening mammogram could also find out whether breast arterial calcification is present on the mammogram and to what extent,” Dr. Parghi said. “They could subsequently speak to their physicians about a broader cardiovascular screening to assess whether they need medical optimization or additional testing.”

Future research will focus on developing and deploying AI tools to use as a screening mechanism across a large screening database; an effort that Dr. Parghi linked to the theme of this year’s meeting: *Leading Through Change*.

“As we continue to focus on how we lead through change, we need to change the way we think about incidental findings,” he said. “Are they really incidental findings or are they opportunities to inform patients about their unique opportunities to intervene early? We talk about early detection for breast cancer, maybe we need to think about early detection for other diseases.”

Access the presentation, “Artificial Intelligence Assessment of Breast Arterial Calcifications on Mammography in a Large Screening Population,” (T3-SBSBR05-02) on demand at [Meeting.RSNA.org](http://Meeting.RSNA.org).



Parghi

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## Transforming Health Care By Empowering Patients With Insights Into Their Health

who noted that only one in 10 people diagnosed with high blood pressure actually use a blood pressure cuff to monitor their condition. “The other nine don’t like the experience,” he added.

Dr. Gupta went on to say that this poor patient engagement is a big reason why we aren’t seeing improvements in such health risk factors as hypertension, diabetes, obesity or cholesterol.

“This is why we are talking about contactless mirrors for vital sign detection and tech-forward toilet seats for blood pressure,” he said.

### Moving the Needle on Patient Care

This lack of engagement is also why physicians need to talk about how they treat patients.

“Patients want to access home health care before they need to go to the hospital, not just after being discharged,” Dr. Gupta said.

Here, non-traditional resources are helping to move the needle on patient care. For

example, one asynchronous, telemedicine platform allows other telehealth providers to easily access as many patients as possible, as quickly as possible—in some cases under 30 minutes—and as cheaply as possible.

“I think virtual telemedicine can help address today’s shortage in health care workers while also meeting patients where they want to receive care,” Dr. Gupta remarked.

### Delivering the Future of Medicine

Even in the ICU and clinical setting, technology is working to shrink the “time to treatment” gap. For instance, generative AI tools are streamlining the clinical workflow, not only by transforming medical documentation, but also by providing physicians with real-time differential diagnosis and even clinical plans.

“Time to treatment is what matters, but it’s generally something we haven’t gotten right,” Dr. Gupta concluded. “By digitizing every step of the process—from diagnosis

to prescriptions, triage to treatment—we have a real opportunity to increase engagement, improve outcomes, lower costs and deliver the future of medicine.”

Access the plenary, “The Future of Healthcare Delivery: Considerations for Patients and Providers,” (T4-PL04) on demand at [Meeting.RSNA.org](https://www.rsna.org/Meeting/RSNA.org).



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Vin Gupta, MD

## Physics Tip



MR scanning with blankets on a patient with active implants is often considered off-label because they increase patient temperature and are explicitly forbidden by implant manufacturers.

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## Langlotz Named RSNA President

the RadLex terminology standard, the LOINC-RadLex Playbook of standard exam codes and the RSNA Imaging AI Certificate program.

Dr. Langlotz has also served as a member of the RSNA Publications Council, the Research Development Committee, the *Radiology* Editor Search Committee and the Steering Committee for the RSNA Digital Roadmap. He has served on the RSNA Board of Directors as the liaison for information technology and annual meeting since 2016, and as chair for the past year.

His National Institutes of Health (NIH)-funded research laboratory aims to reduce diagnostic errors and improve the accuracy and consistency of clinical communication by developing novel machine learning algorithms that provide real-time assistance to physicians and patients. Dr. Langlotz has authored or co-authored 200 scientific publications, reviews and editorials. He has also authored *The Radiology Report: A Guide to Thoughtful Communication for Radiologists and Other Medical Professionals* and co-edited *Cancer Informatics: Essential Technologies for Clinical Trials*.

Dr. Langlotz and his trainees have been recognized for their contributions to radiology research with many scientific awards, including numerous best paper awards and research career development grants.

He is a principal investigator for several projects funded by the NIH, including the Medical Imaging and Data Resource Center (MIDRC), an opensource database that has ingested more than 300,000 medical imaging exams to help doctors better understand, diagnose, monitor and treat COVID-19.

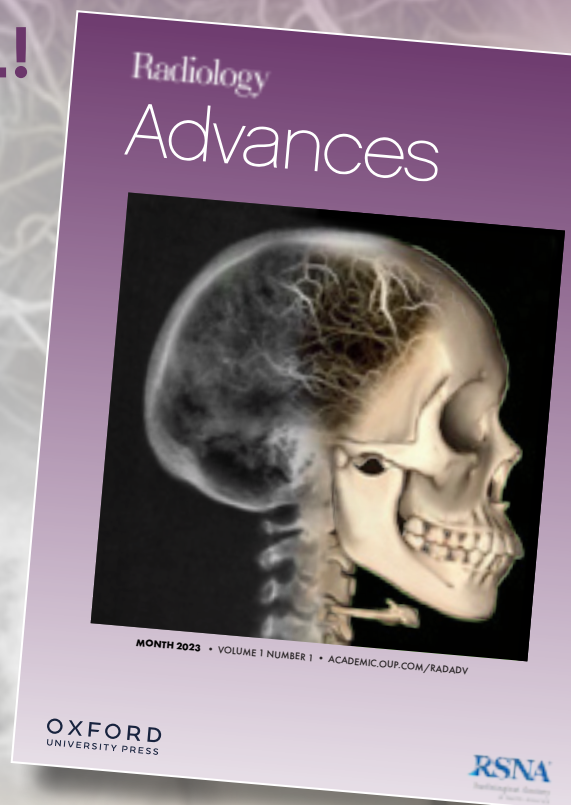
Dr. Langlotz founded and is a past president of the Radiology Alliance for Health Services Research. He received its career achievement award in 2017. Dr. Langlotz served as chair of the Society for Imaging Informatics in Medicine (SIIM) and as a board member of the Association of University Radiologists and the American Medical Informatics Association. He is a fellow of the American College of Medical Informatics, the American Institute for Medical and Biological Engineering and the SIIM. He has served on the external advisory board of the National Cancer Institute’s Imaging Data Commons for the past three years.

Dr. Langlotz has founded three health care information technology companies, most recently Montage Healthcare Solutions, which was acquired by Nuance Communications in 2016.

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