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November/December 2022

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- Unpacking the double-digit market recovery that took place in 2021 p. 28

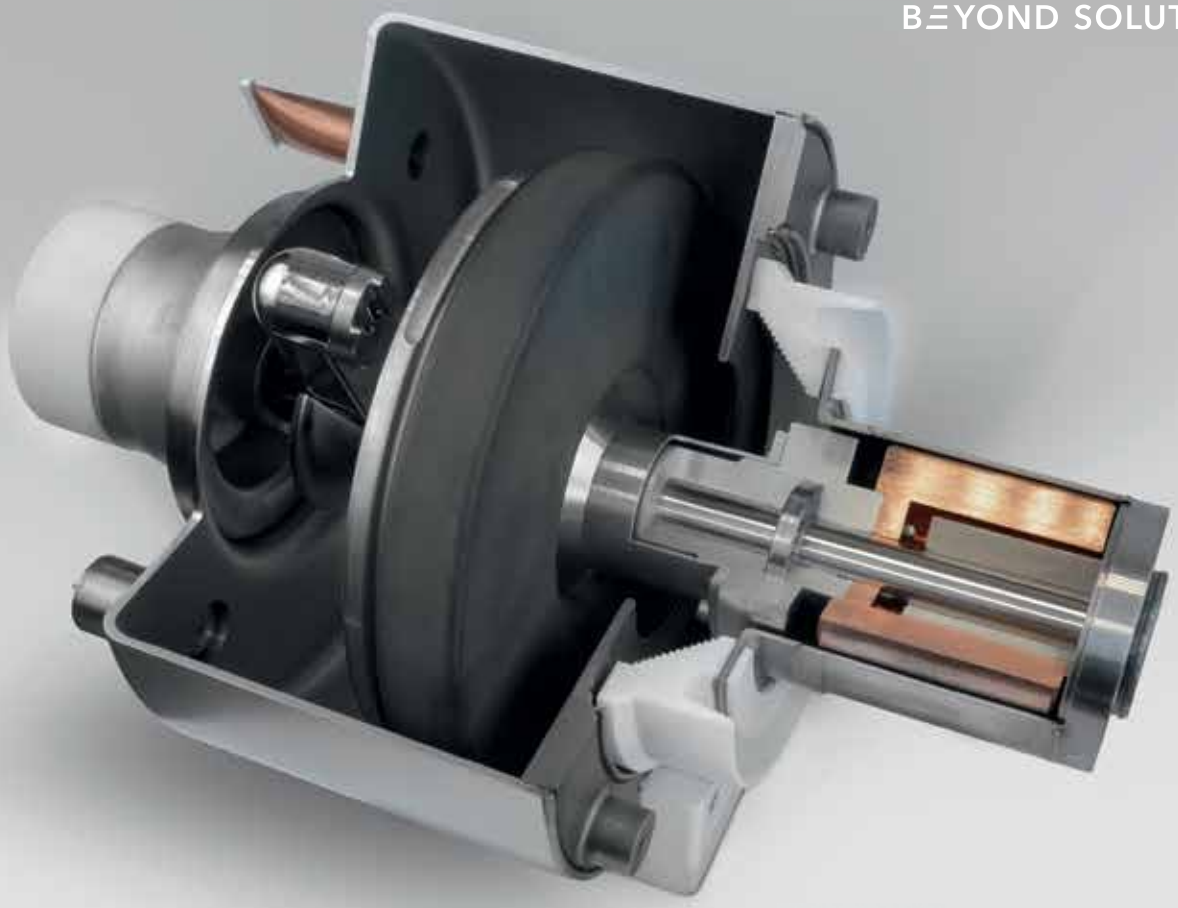
FORCES IMPACTING IMAGING

- Will AI ultimately replace or assist radiologists? p. 56

THE NEXT ERA IN RADIOGRAPHY TECH

- We go around the industry to find out what's new in X-ray p. 66

BEYOND SOLUTIONS



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HealthCare Business News is published by DOTmed.com, Inc., 29 Broadway, Suite 2500, New York, NY 10006

BPA WORLDWIDE BUSINESS

Looking into the future

Most people in healthcare have accepted an answer to the somewhat rhetorical question: will AI replace radiologists? "No. It will be a tool that makes them more accurate, more efficient, and frees them up to spend more time with patients."

As far as the medical career of anyone alive today is concerned, I think that answer is rock solid. In fact, (and I don't think I'm giving anything away here) it lines up neatly with some of the findings on page 56 of this magazine, where our senior reporter John R. Fischer talks with several radiologists about how AI is materializing, and how the next few years may unfold. It's a story that stresses the short-term challenges and limitations of AI, and I recommend reading it before checking in with exhibitors on the show floor at RSNA about their latest innovations.

For those of you who will be on-site at McCormick Place in Chicago this year, what are the things happening in radiology that you're excited to learn more about? Is there a particular company or imaging modality that you plan to investigate? I hope you will get in touch regarding the most interesting news, research and technology you discover at the show. Our team of reporters will be monitoring developments closely and providing Daily News updates on what we find.

Speaking of the Daily News, since this is our final magazine of the year, be sure to check out our top 10 stories in X-ray, MR, CT, and AI scattered throughout this issue. The stories are presented chronologically and were chosen based on readership. If you are not currently registered for our online Daily News, I highly recommend you sign up! It is free to read, and several new original stories are published every day.

Thank you, as always, to our readers. It is a joy bringing you this magazine each month. On behalf of our entire team at DOTmed and HealthCare Business News, here's wishing you a happy holiday. We will see you in 2023!

Thanks for reading,

Gus Iversen
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Siemens Healthineers creates separate business sector for China

Posted online October 05, 2022 by John R. Fischer

Siemens Healthineers is dividing its Asia-Pacific operations into two separate entities, with one focused entirely on China and the other dedicated to the company's new Asia-Pacific Japan region.

Jerry Wang, who oversees operations in China, will continue in this role. Vy Tran, who formerly was chief compliance and quality officer for Varian before and after its acquisition by Siemens Healthineers, will head the Asia Pacific Japan region.

Prior to the split, the company's Asia-Pacific region accounted for 27% of its total revenue in fiscal year 2021, at €4.82 billion ($4.65 billion). China's contribution alone was almost half of this, at €2.35 billion.

"It makes sense to allow diverse and fast-growing Asia Pacific markets to flourish in their own right, while establishing China, set to be the biggest global market in medical technology by 2030, as its own region," said Elisabeth Staudinger, the former head of Asia Pacific operations who was recently promoted to the Siemens Healthineers managing board.

Staudinger will be responsible at the board level for the two new regions.

Vy Tran will move at the end of December from California to Singapore, where she will oversee operations in her new role.

Joining Varian, now a Siemens Healthineers company, in 1998, Tran has held leadership positions around its regulatory affairs, quality and compliance. She also has played a role in its acquisitions and divestments, including its merger with Siemens Healthineers, and is an expert on global regulation, ethics and trade, according to Siemens.

"I look forward to working with the team to further expand growth and access to care in this very exciting region," she said.

Wang began working in sales marketing with Siemens Healthineers in 2001 and eventually became general manager of diagnostic imaging and advanced therapies. He left the company briefly to work for Sorin Group and then Philips, where he also oversaw Chinese business operations. He returned to Siemens in 2018.

"I welcome this opportunity to focus even more clearly on China's most urgent healthcare needs," he said.

Read full story: dotmed.com/news/58939

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VIDEO INTERVIEWS

In Five Minutes in Healthcare, HCB News publisher Phil Jacobus chats with industry leaders about the COVID-19 impact via Zoom.

Check it out at: dotmed.com/news/jacobus

Top trending headlines as we went to print:

GE Healthcare partners with Chile-based mining company to meet future contrast media demands
dotmed.com/news/59013

Photon-counting detectors advance CT technology
dotmed.com/news/58825

Carestream introduces 100-micron pixel pitch X-ray detectors
dotmed.com/news/59070

Intermountain Healthcare takes Utah medication delivery to the skies with Zipline drones
dotmed.com/news/58950

Medtronic to spin off patient monitoring, respiratory interventions as one company
dotmed.com/news/59111

Fed objects to proposed Crouse-Upstate University hospital merger in NY
dotmed.com/news/59069

Radiology Business Solutions acquires proton therapy administration consultant Apollo Healthcare
dotmed.com/news/58999

Oracle-Cerner EHR issues affect nearly 42,000 veterans, says VA
dotmed.com/news/59061

Spectrum Dynamics, Kromek introduce digital SPECT/CT for high-energy imaging
dotmed.com/news/59039

Philips Respironics initiates sixth recall of BiPAP, CPAP masks
dotmed.com/news/59095

Beckman Institute awarded $2 million to develop 3D ultrasound 'clip on' device for 2D imagers
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TTG Imaging Solutions acquires Acceletronics and RadParts
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Mounting helium shortages raise concerns over future MR access
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Woman arrested in connection with false bomb threat made against Boston Children's Hospital
dotmed.com/news/58984

FDA offers update on breast density notification law timeline
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AI raises questions by predicting race from medical images

Posted online October 25, 2022 by John R. Fischer

Researchers at the National Institutes of Health say that artificial intelligence may unknowingly increase racial disparities after finding models were able to accurately identify self-reported race in several different types of radiographic scans, with no explanation as to how.

The scientists designed AI applications that could predict race solely from chest X-rays but found that they also predicted race with high accuracy from mammograms, cervical spine radiographs and CT scans, regardless of the anatomic location.

They also determined race even in images that were highly degraded, cropped to one ninth of their original size or had resolution modified to the point where they barely resembled X-rays.

The researchers were unable to explain how the models did this, indicating that the information they use to make these predictions is not yet known and that AI may unknowingly incorporate racial data, leading to potential biases.

Prior research has proven that several potential factors can make AI algorithms racially biased, including data sets not representative of different patient populations, and phenotypes disproportionately present in subgroup populations, such as racial differences in breast or bone density.

The researchers assessed three large data sets of a diverse patient population with their algorithms. They looked at potential factors that could affect features in radiographic images, including body mass index, breast density, bone density, or disease distribution, but found no answers as to how the algorithm detected race.

"There has been a line of thought that if developers 'hide' demographic factors — like race, gender, or socioeconomic status from the AI model, that the resulting algorithm will not be able to discriminate based on such features and will therefore be 'fair'. This work highlights that this simplistic view is not a viable option for assuring equity in AI and machine learning," said NIBIB DATA Scholar Rui Sá.

Researchers at Harvard and MIT had similar findings in a study published earlier this year where an AI algorithm predicted race with 90% accuracy just by reading X-ray scans, even when filters were applied.

The findings were published in Lancet Digital Health.

Read full story: dotmed.com/news/59083

LifeBridge Health to pay $9.5 million as retribution for 2018 data breach

Posted online October 12, 2022 by John R. Fischer

LifeBridge Health has agreed to pay $9.5 million in retribution to patients whose information was disclosed in a 2018 data breach.

Based in Baltimore, LifeBridge Health revealed in May 2018 that it was the victim of a data breach that impacted 530,000 patients. The health system detected malware on a server that hosts EMRs for one of its physician practices, Potomac Physicians, and the shared registration and billing system of other LifeBridge Health providers, according to Health IT Security.

An investigation revealed that the initial leak occurred in September 2016 and continued for 18 months. Names, dates of birth, social security numbers, diagnoses, medications, clinical and treatment information, insurance information and other data were impacted.

Additionally, another breach that occurred between December 2019 and April 2020 on records at its Sinai Hospital location also affected patients.

Because of these attacks, patients experienced declined transactions, email account access problems, fraudulent accounts, fraudulent unemployment submissions and fraudulent applications for COVID-19 disaster business loans, reported Top Class Actions.

Read full story: dotmed.com/news/58974

Insurers paying providers too much for radiology services, says study

Posted online October 18, 2022 by John R. Fischer

Insurance companies may be paying more than necessary for common radiology services, with variations found in pricing for the same services at the same hospital.

This trend was even seen among different health plans managed by the same insurer, said researchers at Johns Hopkins Carey Business School in a new study that looked at commercial negotiated prices from private payers for the 13 shoppable radiology services designated by CMS.

Wider price gaps were most notable among CT and MR exams, relative to Medicare, when compared to other radiology services. The largest were in brain CT, where 25% of hospital-insurance company pairs had a maximum that was more than 2.4 times their minimum negotiated price.

Study co-author Ge Bai, a professor of accounting, says this is significant, given the passage of the Hospital Price Transparency Rule in 2021, and because it gives radiologists the opportunity to provide high-quality imaging at lower costs in nonhospital settings.

Under the law, hospitals must list certain service prices on their websites, including a consumer-friendly searchable list of 300 medical procedures.

Read full story: dotmed.com/news/59024

Philips to eliminate 4,000 jobs in the wake of recall and inflation woes

Posted online October 26, 2022 by John R. Fischer

More than 4,000 jobs will be cut from Philips' roster in response to falling sales and a recall of over 18 million respiratory masks, the company announced Monday.

The layoffs represent 5% of Philips' 78,000 workforce and will mainly take place in the U.S. and in the Netherlands, where the company is headquartered, primarily in areas where sales are dropping, according to Reuters.

The decision comes a week after Roy Jakobs succeeded Frans van Houten as CEO. Jakobs says the cuts are "unfortunate, but necessary," as they will allow the company to save an annual $295.41 million (€300 million), which will go toward reorganizing it in the coming quarters.

The company has experienced six major recalls in the last year and a half, including a recent one in September of over 17 million sleep apnea masks, due to a risk of their magnets interfering with implanted metal medical devices.

"We have now had five quarters of declining sales, declining profit, and now… [in the third quarter] we also have become loss-making," CEO Roy Jakobs, said in a telephone interview with Reuters.

Additionally, Philips is still in the midst of recalling 5.5 million BiPAP and CPAP machines after discovering that the sound abatement foam within them could break down and release particles that could enter a device's airway pathway and become toxic, possibly causing cancer.

It also is dealing with inflation woes, with demand falling rapidly in China and to a lesser extent in Western Europe, while North America is "still holding strong," says Jakobs.

And worse than anticipated, ongoing supply chain problems caused comparable sales to dip 6% to $4.2 billion (€4.3 billion) from July to September and will continue to weigh on sales in the final months of 2022, reported Reuters.

As a result, Philips has reduced its full-year outlook, expecting a weaker profit margin and for sales to decline in the mid-single-digits, compared with its initial forecast of 1%-3% sales growth, according to The Wall Street Journal.

Read full story: dotmed.com/news/59118

Samsung splitting ultrasound business into two separate divisions

Posted online October 12, 2022 by John R. Fischer

Samsung is increasing its investment in its North American ultrasound business and splitting the sector into two separate entities, one focused on general radiology and the other specifically on women's health.

The women's health ultrasound business will be led by Tracy Bury and focus on maternal-fetal medicine, assisted reproductive medicine and obstetrics and gynecology markets.

Senior director Dan Monaghan will continue to oversee the company's general imaging, point-of-care and veterinary ultrasound businesses.

The company also plans to invest in new products equipped with Samsung technology for order processing system improvements; to expand services such as remote automation; and to expand its market coverage to serve more integrated delivery networks.

David Legg, head of Boston Imaging, the healthcare subsidiary and U.S. headquarters for Samsung's digital radiography and ultrasound business, says that segmenting the ultrasound business will accelerate adoption of the imaging modality and offer providers a better understanding of specific patient populations and clinical markets.

"Adding leadership talent with a depth of market knowledge and experience in key segments is necessary to accomplish this," he said in a statement.

The company will incorporate its image quality, ergonomics and AI-assisted software into the design of lifelong solutions produced by the women's health ultrasound unit. The aim of the business and other investments is to facilitate easier access for the patients to the imaging technology.

Bury brings over 25 years of experience to Samsung, having previously led the U.S. Women's Health business at GE Healthcare and global ultrasound teams at Siemens Healthineers.

"I'm excited to be a part of the Samsung vision of segmenting the ultrasound business, enabling us to provide dedicated people, products and processes to address the specific needs of Women's Health patients and clinicians," she said.

Boston Imaging introduced, in September, a new ultrasound system, the V7, which is equipped with Crystal Architecture for enhanced image clarity and penetration and utilizes beamforming (CrystalBeam), sophisticated image processing (CrystalLive) and advanced S-Vue Single Crystal Transducers to produce high-resolution images.

Read full story: dotmed.com/news/58985

Amyloid PET scans can rule out Alzheimer's, inform long-term care planning

Posted online October 06, 2022 by John R. Fischer

Amyloid PET scans can accurately diagnose or rule out Alzheimer's disease in veterans with memory loss and may be useful for managing their long-term clinical care.

That's what researchers in the Memory Disorders Clinic at the VA Boston Healthcare System found in two studies on the scans, which are minimally invasive diagnostic procedures for measuring amyloid, a naturally occurring protein in and common biomarker of the disease.

The clinic is one of the few VA programs where this type of imaging is conducted, with others and private sector facilities not typically performing it because of insurers and Medicare not reimbursing for it, despite being FDA-approved.

"Our study is unique because it's the first use of amyloid PET scans in clinical practice that showed clinical management impacts in a real-world setting," said Dr. Katherine Turk, a neurologist at the VA Boston Healthcare System and a co-author of the research, in a statement.

The researchers are using national VA data to better understand how often amyloid PET scans are ordered and to see if their work will add to guidelines and increase usage in other VA clinics.

Read full story: dotmed.com/news/58928

Errors and neglect lead to deaths at Chicago safety net hospital

Posted online October 19, 2022 by John R. Fischer

Errors and neglect at Roseland Community Hospital in Chicago's South Side have been responsible for the deaths of at least 13 patients since January 2020.

Four of the deaths have resulted in lawsuits and two were reported by a former Roseland physician in a whistleblower complaint. All 13, which included one pregnant woman, occurred in several departments under the watch of different employees and leaders, reported ProPublica and WTTW News in a joint investigation.

Some of the deaths reported include:

- One from respiratory failure from allegedly delaying insertion of breathing tube
- Three linked to failure to check vital signs
- One due to a seven-hour delay in insulin treatment
- Two linked to monitoring and assessment lapses

Additionally, the safety net hospital has been cited at least 72 times by federal regulators since January 2017, more than any other hospital in Illinois. It has received eight immediate jeopardy citations for problems left uncorrected, that pose harm or death to patients.

Read full story: dotmed.com/news/59057

First-in-human study shows potential for FLASH proton therapy

Posted online October 26, 2022 by John R. Fischer

In a first-in-human study, FLASH proton therapy proved to be as safe and effective as conventional radiation therapy when administered to patients with bone metastases.

Delivering doses that are more than 300 times higher than conventional radiation, FLASH therapy takes less than a second and potentially reduces damage to normal surrounding tissue, while destroying cancer.

Researchers at Cincinnati Children's/University of Cincinnati Medical Center Proton Therapy Center and Varian, a Siemens Healthineers company, tested it on 10 adults with bone tumors in the arms and legs, finding that it reduced pain and potentially side effects associated with conventional radiation.

The study is the FAST-01 trial and was presented on October 3 at the American Society for Radiation Oncology (ASTRO) Annual Meeting in San Antonio, Texas.

The researchers say their research may lead to FLASH being used to treat more critical sites like the brain, lungs and gastrointestinal area.

"We need human data to see if there are any unexpected side effects. Treating arms and legs is not as risky as treating someone's brain or lungs," said Dr. John Breneman, FASTRO, principal trial investigator and medical director of UCMC's Proton Therapy Center.

Preclinical animal trials suggest that proton therapy can be safely delivered in high doses with less harmful side effects.

The researchers used Varian's ProBeam particle accelerator in the study. Treatment was applied to 12 metastatic sites. A single fraction had 8 Gy of radiation and was delivered at ≥40 Gy per second.

The researchers assessed pain, pain medications and adverse events on the day of treatment and at various points for over a year after. Seven patients experienced complete or partial pain relief, with pain relieved completely in six sites and partially in two others. Temporary pain flares were seen in four sites.

"We did not see any unexpected additional toxicity with the substantially shorter treatment," said lead study author Dr. Emily Daugherty, an assistant professor of clinical radiation oncology at UCCC, in a statement.

Read full story: dotmed.com/news/59120

One man dead, suspect arrested in Arkansas hospital shooting

Posted online October 04, 2022 by John R. Fischer

A shooting at an Arkansas hospital has left one man dead and another in police custody on charges of capital murder and aggravated assault.

Sherwood Police Department Chief Jeff Hager told reporters at a news conference on September 28 that Raymond Lovett Jr., 24, had been arrested as a person of interest in the shooting of 21-year-old Leighton Whitfield earlier that morning at CHI St. Vincent North hospital. Authorities said that Lovett knew and targeted Whitfield, who was visiting a patient in the hospital at the time.

Whitfield died from at least one gunshot wound, while Lovett Jr. fled. Police found and arrested him within two hours of the incident, according to local CBS affiliate, THV11.

"Our prayers go out to our patients, their families, our heroic coworkers and their families," said Chad Aduddell, CEO of CHI St. Vincent, in a statement.

The shooting occurred on the fourth floor, according to hospital employees, with police tipped off at about 9:45 a.m. Officers initially reported on social media that they were responding to "an incident" before later calling it an "active shooter" situation.

Read full story: dotmed.com/news/58913

Google Cloud launches Medical Imaging Suite

Posted online October 11, 2022 by John R. Fischer

Google Cloud has launched Medical Imaging Suite, a new solution for simplifying AI model development and improving interoperability.

Imaging accounts for about 90% of all healthcare data, with the number of scans continuing to increase. Medical Imaging Suite's applications are designed to speed up imaging interpretation and increase productivity so that radiologists can better manage these higher workloads.

"Google pioneered the use of AI and computer vision in Google Photos, Google Image Search, and Google Lens, and now we're making our imaging expertise, tools and technologies available for healthcare and life sciences enterprises," said Alissa Hsu Lynch, global lead of Google Cloud's MedTech Strategy and Solutions, in a statement.

The platform utilizes technologies from partner companies to carry out its functions. Among them are:

Cloud Healthcare API, which uses NetApp's on-prem-to-cloud data management system and Change Healthcare's cloud-native enterprise imaging PACS for easy and secure data exchange via the international DICOMweb standard. This includes automated DICOM de-identification.

Imaging Lab, which automates image labeling with NVIDIA's and MONAI's AI-assisted annotation tools and can natively integrate with any DICOMweb viewer.

Imaging Datasets and Dashboards, for searching petabytes of imaging data via BigQuery and Looker advanced analytics and creating training datasets with zero operational overhead.

Imaging AI Pipelines, which uses Vertex AI to build scalable machine learning models with 80% fewer lines of code required.

Imaging Deployment, a flexible option for cloud, on-prem, or edge deployment facilitated by Anthos to meet sovereignty, data security, and privacy requirements. It provides centralized management and policy enforcement with Google Distributed Cloud.

The solution is already being used by Hackensack Meridian Health, in New Jersey, to de-identify petabytes of images and build algorithms to predict metastasis in patients with prostate cancer.

Hologic is also using it with its Genius Digital Diagnostics System, the first CE-marked digital cytology platform for labs that combines AI with advanced volumetric imaging technology to identify precancerous lesions and cervical cancer cells.

Read full story: dotmed.com/news/58973

Imaging parts and service provider DirectMed acquires ScanMed

Posted online October 11, 2022 by Gus Iversen

DirectMed Parts & Service, a leading medical imaging parts, systems, and service company, announced today that it has acquired ScanMed, a leader in MR coil design, manufacture, and repair.

Based in Omaha, Nebraska, ScanMed is an OEM-certified company with a proven record of designing and repairing coils for GE Healthcare, Siemens, Philips, and Canon/Toshiba systems, among others. The company's proprietary coils include the Procure prostate coil, pediatric blanket and brain coils, spine, vascular, and several extremity coils.

The company was founded in 2004 by Dr. Randall Jones, an industry innovator with a doctorate in electrical engineering, and 30 years of experience in medical imaging. Dr. Jones and his team have been awarded 12 design patents and developed numerous trade secrets enabling ScanMed to be the foremost MR depot-level coil repair partner for healthcare networks, independent service organizations (ISOs) and diagnostic imaging parts suppliers.

With over 60,000 parts in stock, DirectMed repairs, supports and sells GE, Siemens, Philips and Canon/Toshiba MR and CT parts to healthcare networks, imaging centers and ISOs around the world.

Read full story: dotmed.com/news/58975

Data from French hospital that refused to pay ransom leaked to dark web

Posted online October 03, 2022 by John R. Fischer

Hackers who infiltrated and stole data from a French hospital in August have now released personal patient records on the dark web in response to the institution's refusal to pay the group's $1 million ransom.

The 1,000-bed Centre Hospitalier Sud Francilien (CHSF) in Corbeil-Essonnes, near Paris, shut down its emergency services and transferred many patients to other hospital facilities after finding that the Lockbit ransomware group stole social security numbers, medical scans, lab reports and other health data via a ransomware strain known as Lockbit 3.0.

Under French law, public institutions are banned from paying ransoms. The group demanded $10 million (over €10 million) for the return of the data. It later downgraded the ransom to $1 million (over €1 million) and postponed the ultimatum deadline, but the hospital still refused to pay, according to French outlet, Le Parisien.

"Even if they ask for 150,000 euros, we will not pay. That is the rule that has been established," said Medhy Zeghouf, president of the board of CHSF.

In response, the group published 12 gigabytes of patient and staff data the weekend of September 23 on the dark web.

Read full story: dotmed.com/news/58903

GE Healthcare unveils its first all-digital PET/CT scanner

Posted online October 19, 2022 by John R. Fischer

GE Healthcare debuted its first all-digital PET/CT scanner, Omni Legend, on October 16 at the European Association of Nuclear Medicine Annual Meeting in Barcelona, Spain.

Designed to advance theranostic capabilities, the solution has two times the sensitivity of prior digital scanners, allowing it to image high-count tracers for cardiac and neuro imaging, produce faster total scan times, with a greater ability to identify small lesions.

Other applications include its Precision DL solution for deep learning image processing; an AI-based auto positioning camera; Q.Clear for PET image reconstruction; and MotionFree, a deviceless respiratory motion correction solution.

"We have been able to increase patient throughput by more than a third thanks to the system's fast total scan times — even achieving 35 patient scans in a 9.5-hour shift — and reduce dose by 40% versus the previous equipment that was installed," said John Kennedy, chief physicist of the nuclear medicine department at Rambam Health Care Campus in Israel, in a statement.

Omni Legend has the highest sensitivity per centimeter in the market, due to a new category of digital BGO detector material with a small crystal size that doubles its sensitivity. It also has a 32 cm axial field-of-view and has up to a 2.2 increase in system sensitivity, compared to Discovery MI 25 cm, as well as a 53% reduction in PET scan time and 60% reduction in dose.

Among the tracers it can image are Gallium 68 for diagnosing, staging and restaging diseases. "Clinicians and patients are especially seeing much success with theranostics in prostate cancer — a highly manageable disease, but one that is difficult to treat when diagnosed late. Omni Legend's ability to image Gallium 68 is an important enabler in healthcare systems ability to adopt theranostics practices into their day-to-day operations now and in the future," Erez Levy, general manager of molecular imaging at GE Healthcare, told HCB News.

Read full story: dotmed.com/news/59038

Medline to oversee Hoag's supply chain needs in $200 million deal

Posted online October 17, 2022 by John R. Fischer

Hoag Memorial Hospital Presbyterian has chosen Medline to be its prime supply chain vendor as part of a $200 million, multiyear partnership.

Medline will provide supplies and solutions for the Newport Beach healthcare system's acute and nonacute care network for the Orange County community in California. Hoag employs 1,800 physicians in 15 urgent care facilities, 10 health and wellness centers, and two hospitals.

A full-time analyst and customer service specialists will address specific caregiver needs and develop ways for optimizing care. Hoag will be able to monitor metrics such as item utilization, contract compliance, price accuracy and spend per product, with Medline's advanced analytics platform.

"Medline's dedication to its trade, combined with its infrastructure investments and ability to scale, gives us great confidence in them as a partner for today, as well as one that can help position Hoag for continued excellence in the years to come," Binh Pham, executive director of supply chain operations at Hoag, said in a statement.

Medline will service the provider from its state-of-the-art, nearly 1.1 million square-foot distribution center in Rialto, California.

Read full story: dotmed.com/news/59014

Ultralow-dose total-body PET/CT may help guide arthritis treatment

Posted online October 18, 2022 by John R. Fischer

Total-body PET/CT may offer unknown insights and objective biomarkers for determining appropriate treatments for patients with autoimmune inflammatory arthritides.

Researchers at the University of California-Davis, which helped develop and install the first U.S.-based total-body PET/CT, saw systemic joint involvement in such patients and found strong correlation between the scanner and joint-by-joint rheumatological evaluations. They also saw moderate to strong correlation with rheumatological outcomes.

Their findings are part of first-in-human research on total-body PET/CT for arthritis, which affects approximately one in four adults (58 million Americans) and is projected to be diagnosed in 78 million by 2040.

"It is unclear which patients should receive which treatments, how exactly these treatments change the inflammatory status of different tissues or outcomes, and the impact the disease and treatments have on other organs of the body," said Abhijit J. Chaudhari, professor of radiology at UC Davis.

Using an ultralow-dose 18F-FDG total-body PET/CT acquisition protocol, the group scanned 24 patients with AIA and six with osteoarthritis, and also performed joint-by-joint rheumatologic exams. They assessed 1,997 joints in total.

Read full story: dotmed.com/news/59023

Cleveland Clinic, IBM installing first quantum computer in healthcare

Posted online October 20, 2022 by John R. Fischer

Cleveland Clinic and IBM have started the installation of what will be the first quantum computer for healthcare.

Announced in 2021, the joint clinic is named the Cleveland-IBM Discovery Accelerator and will be located at Cleveland Clinic's main campus. It is part of a 10-year partnership between both organizations and will also be the first private sector onsite, IBM-managed quantum computer in the U.S.

The installation is expected to be completed in early 2023. "We cannot afford to continue to spend a decade or more going from a research idea in a lab to therapies on the market. Quantum offers a future to transform this pace, particularly in drug discovery and machine learning," said Dr. Lara Jehi, Cleveland Clinic's chief research information officer, in a statement.

Therapeutics and biomarker research and commercialization takes about 17 years. The Discovery Accelerator will incorporate a generative toolkit and modeling capabilities that utilize AI to bridge knowledge gaps and produce hypotheses to speed this up.

It also includes RXN, a cloud-based application that uses AI and directly controls robotic labs for end-to-end production of new chemical compounds.

Other applications include Deep Search, an AI tool for generating insights from large amounts of structured and unstructured technical literature; and high-performance hybrid cloud computing to "burst" workloads into the cloud and scale up access to resources for researchers.

As the technology foundation, Cleveland Clinic's Global Center for Pathogen Research and Human Health plans to use Discovery Accelerator's advanced computation technology to speed up critical treatment and vaccine research for emerging pathogens and virus-related diseases.

Researchers are already using IBM's quantum computing cloud offering in several collaborative projects, including a study to develop a quantum method for screening and optimizing drugs targeted to specific proteins; improving a prediction model for cardiovascular risk following noncardiac surgery; and using AI to assess genome sequence findings and large drug-target databases for existing pharmaceuticals that can help treat Alzheimer's and other diseases.

Read full story: dotmed.com/news/59067

Optum completes $13 billion acquisition of Change Healthcare

Posted online October 10, 2022 by John R. Fischer

Optum has completed its $13 billion acquisition of Change Healthcare.

The closing of the deal ends a months-long legal battle with the Department of Justice, which sued in an unsuccessful attempt to block it from moving forward.

"The combination will connect and simplify the core clinical, administrative and payment processes health care providers and payers depend on to serve patients. Increasing efficiency and reducing friction will benefit the entire health system, resulting in lower costs and a better experience for all stakeholders," said Optum in a statement.

The companies announced the merger in January 2021, with Optum paying $8 billion, plus an additional $5 billion for Change's debts.

Optum is a subsidiary of UnitedHealth Group (UHG), the owner of the largest U.S. healthcare insurance provider, UnitedHealthcare. Concerns from other organizations about the deal creating a monopoly for UHG and hindering competition in the health IT space led the Justice Department to launch an investigation in March 2021.

It will divest Change's claims editing business of ClaimsXten to TPG Capital, which is also a condition of the court order.

Read full story: dotmed.com/news/58962

Mayo Clinic to install Siemens Biograph Vision Quadra PET/CT system

Posted online October 06, 2022 by John R. Fischer

Mayo Clinic will be the first North American provider to perform scans on patients with Siemens Healthineers' Biograph Vision Quadra PET/CT scanner.

Recently installed at its Rochester location, the 106-centimeter-long PET/CT is capable of imaging a patient from the top of their head to their legs simultaneously, at reduced radiation exposures, and has ultrafast timing resolution that makes it the most sensitive PET/CT on the market for clinical use.

Scans with the system are scheduled to begin later this year, with Mayo Clinic expecting it to dramatically increase quality and speed of clinical PET/CT, especially for the diagnosis, staging and treatment of cancer.

"This new scanner is literally an order of magnitude more powerful than our prior best PET/CT scanners, allowing for dramatic improvements in clinical practice while also opening whole new horizons," said Dr. Geoffrey Johnson, chair of the division of nuclear medicine in the department of radiology at Mayo Clinic, in a statement.

Cleared by the FDA in March 2021, the system's large axial field of view is four times that of Siemens' Biograph Vision 600.

Read full story: dotmed.com/news/58951

Rethink Healthcare acquires six micro-hospitals in Texas

Posted online October 04, 2022 by John R. Fischer

Rethink Healthcare Real Estate has acquired six micro-hospitals under Baylor Scott & White Health in the Dallas/Fort Worth metroplex area of Texas.

Containing an average of eight to 10 short stay beds, micro-hospitals are small inpatient facilities that provide simple acute and emergency services often performed in big hospitals.

An alternative to long waiting lists in large hospitals, they are located in underserved areas that lack the resources to support a full-service facility, according to Emerus, which operates 20 across the U.S., including the six Baylor Scott & White Health facilities.

Recently rebranded, Rethink Healthcare Real Estate was formerly known as Seavest Healthcare Properties. It financed the acquisition through a joint venture with Heitman LLC, a global real estate investment management firm with over $53 billion in assets. It also appointed CIT, a division of First Citizens Bank, to arrange for $58.9 million to finance debt.

"These emergency hospitals provide critical access points for healthcare needs, including overnight stays. Many of the facilities are complemented by additional clinical space where Baylor-aligned physicians provide non-emergency services such as primary care," said Jonathan Winer, senior managing director and chief investment officer of Seavest.

Operating for seven years, the micro-hospitals are in Burleson, Colleyville, Keller, Murphy, Rockwall and Grand Prairie. Together, they encompass 189,385 rentable square-feet.

Micro-hospitals are becoming more common, with 19 states already home to such facilities, according to Emerus. Their growth comes in the face of larger-scale mergers and acquisitions between big healthcare systems.

The size of small, ambulatory surgery centers, micro-hospitals offer diagnostic services, imaging, labs and pharmacy services 24/7. They typically are located in two- to three-story buildings and unlike EDs, are fully licensed and have inpatient beds.

While priced higher than urgent care centers, they are significantly less expensive than full-service emergency centers or inpatient facilities, reports Patient Engagement Hit, but abide by the same federal and state licensing and regulations as major hospital systems.

Read full story: dotmed.com/news/58902

Too many women in the US are skipping, or not thinking about, mammograms

Posted online October 05, 2022 by John R. Fischer

More than one fifth of women between 35 and 44 say they have never received a mammogram and have no plans of getting one.

Breast cancer kills about 42,000 American women each year, yet only 43% know their family history of the disease and 32%, their own individual risk factors, according to researchers at Orlando Health.

In a national survey commissioned by the university, 22% of women said they did not plan on getting a mammogram and have not had one prior. The researchers say decisions like this put women at greater risk of being diagnosed with an advanced form of the disease.

"Survival goes from nearly 100 percent at stage zero to 50 to 70 percent for those diagnosed at stage two or three," said Dr. Nikita Shah, medical oncology team leader for the Breast Care Center at the Orlando Health Cancer Institute, in a statement.

Additionally, not getting a mammogram goes against guidelines by the National Comprehensive Cancer Network, which recommends that women of average risk get an annual screening starting at age 40.

Read full story: dotmed.com/news/58914

Hospital prices have spiked 31% nationally since 2015: report

Posted online October 05, 2022 by John R. Fischer

Hospital expenses make up nearly one third of U.S. healthcare spending, with prices skyrocketing as much as 31% nationally since 2015.

This increase has been four times faster than growth in workers' wages and reflects how providers have become large corporate entities focused on building up their revenue streams, instead of caring for patients, say the authors of a new paper by Families USA, a nonprofit, nonpartisan consumer health advocacy organization.

Titled "Bleeding Americans Dry: The Role of Big Hospital Corporations in Driving Our Nation's Health Care Affordability and Quality Crisis", the paper attributes the inability of many Americans to afford quality healthcare to the misaligned incentives and unchecked power of hospital business practices around their services and operations.

"This paper exposes how the corporate hospital business model has fundamentally transformed into one that favors monopolies and setting high prices at the expense of our health," said Families USA's executive director Frederick Isasi in a statement.

The paper is the second in a series written by Families USA for its People First Care initiative, a plan to improve America's healthcare system.

Read full story: dotmed.com/news/58915

Italy places €50 million order for 37 Elekta Versa HD linacs

Posted online October 19, 2022 by John R. Fischer

Italy's national health service Servizio Sanitario Nazionale will pay approximately €50 million (over $49 million) for the installation of 37 of Elekta's Versa HD linear accelerators.

Launched in 2013, the Versa HD linear accelerator is capable of administering radiation three times faster than prior linear accelerators, and has high-precision beam shaping and tumor targeting technology. It also uses real-time remote system monitoring to reduce delays and downtime.

The purchase makes up 60% of the linac tender, with the order expected to be booked in the third and fourth quarters of Elekta's fiscal year 2022 to 2023.

The installations are projected to be completed in fiscal years 2023 to 2024 and 2024 to 2025.

"For Italy, it means a modernization of the country's installed base of linacs, providing people with the best technology within precision radiation therapy. These replacements will further strengthen our current leading position in the Italian market," said Ardie Ermers, Elekta's executive vice president for Region Europe, in a statement.

The Versa HD linear accelerator has a low environmental impact, low energy consumption design and customizable, disease-specific configurations.

Its fully integrated Agility 160-leaf multileaf collimator (MLC) enables high-definition, high-speed beam shaping over a 40 x 40-cm field. The Fast MLC leaf speed and High Dose Rate mode allow clinicians to leverage the high dose rate delivery of radiation and perform advanced therapies such as volumetric modulated arc therapy (VMAT), stereotactic radiosurgery (SRS), and stereotactic radiotherapy (SRT) at higher levels without compromising treatment times.

The FDA cleared the system for use shortly after its debut in 2013.

In addition to its deal with Italy, Elekta recently made another with Karkinos Healthcare, a provider in India, to install more than ten linear accelerators at its locations across the country, including several Elekta Versa HD linacs and Elekta Harmony Pro systems, which is the company's most productive linac to date.

The contract is subject to a 35-day standstill period from the time it was announced.

Read full story: dotmed.com/news/59055

Doctor and ex-army major thwarted in attempt to leak US military health data to Russia

Posted online October 03, 2022 by John R. Fischer

An anesthesiologist and her partner have been charged with allegedly plotting to hand over highly sensitive healthcare data on military patients to Russia.

Dr. Anna Gabrielian and former army major Jamie Lee Henry supplied medical records for current military officials from Fort Bragg and their spouses to an individual they believed was a Russian official but was actually an undercover FBI agent, reported Reuters.

The two, who are married and live in Rockville, Maryland, said they were helping Russia in its invasion of Ukraine by providing "insights into the medical conditions of individuals associated with the U.S. government and military," according to an unsealed, eight-count indictment filed in federal court in Maryland.

They are charged with conspiracy and wrongful disclosure of individually identifiable health information.

Gabrielian works at Johns Hopkins Hospital in Baltimore and Henry is a former staff internist at Fort Bragg, the largest military post in the U.S. A spokesperson for Johns Hopkins said that the hospital was "shocked" to learn about this news and "intends to fully cooperate with investigators."

Read full story: dotmed.com/news/58926

Mevion launches compact proton system that fits inside a linac vault

Posted online October 25, 2022 by John R. Fischer

Mevion Medical Systems has unveiled its new MEVION S250-FIT Proton Therapy System, the first and only proton beam solution designed to fit inside existing LINAC vaults.

The FIT system is equipped with HYPERSCAN Pencil Beam Scanning technology for intensity modulated proton therapy and dual-energy large bore diagnostic CT at treatment position for image-guided radiation therapy and adaptive therapy. It also can be utilized in research for FLASH therapy and facilitates access to emerging technologies such as ARC therapy.

FIT refers to Fast deployment of an Integrated design and bringing the Transforming power of proton therapy to more cancer centers. The scanner's compact size will further decrease the costs and complexity of proton therapy, according to Mevion.

"Despite its benefits, access to proton therapy has remained limited due to the cost, size, and equipment complexity. The MEVION S250-FIT is the only proton system that will be able to replace an existing radiation therapy machine, greatly reducing the cost and complexity of deploying proton therapy," Lionel Bouchet, senior VP of commercial development at Mevion Medical System, told HCB News.

Read full story: dotmed.com/news/59096

Upcoming Events

MEDICA / COMPAMED

Location: Düsseldorf, Germany
Dates: November 15 – 18, 2022
Years in existence: 54 years
Average attendance: 128,000
Who should attend: Medical equipment dealers & distributors, group purchasing organizations (GPOs), supply chain specialists, hospital and clinic management, lab management, medical research & development specialists, doctors, healthcare & physiotherapy practitioners, finance/insurance/legal specialists

Radiological Society of North America (RSNA)

Event: Annual Meeting
Location: McCormick Place, Chicago, IL
Dates: November 27 - December 1
Years in existence: 108
Average attendance: 55,000
Who should attend: Physicians, radiologists, physicists, medical professionals in all fields of medicine

Arab Health 2023

Location: Dubai, UAE
Dates: January 30 – February 2, 2023
Years in existence: 48 years
Average attendance: 50,000+
About the event: Arab Health is the largest gathering of healthcare and trade professionals in the MENA regions, welcoming attendees from 159 countries.

ACE Summit and Reverse Expo 2023

Location: Omni Orlando Resort at ChampionsGate in Orlando, FL
Dates: February 20-22, 2023
Years in existence: 10
Average attendance: 600-700
Who should attend: Executives from hospitals and health system architecture, capital Equipment, construction, design, engineers, facilities management, specifiers

European Society of Radiology (ESR)

Event: European Congress of Radiology (ECR) 2023
Location: Austria Center, Vienna
Dates: March 1-5, 2023
Years in existence: 54
Average attendance: 20,000+
Who should attend: Radiologists, radiographers, surgeons, oncologists, technologists

Huntsman Cancer Institute at the University of Utah

Location: Salt Lake City, UT
Year founded: 1995
Number of beds: 100 beds. 48 beds will be added with the latest expansion, the Kathryn F. Kirk Center for Comprehensive Cancer Care & Women's Cancers.
Number of employees: More than 2,700
President: Mary Beckerle, Ph.D.

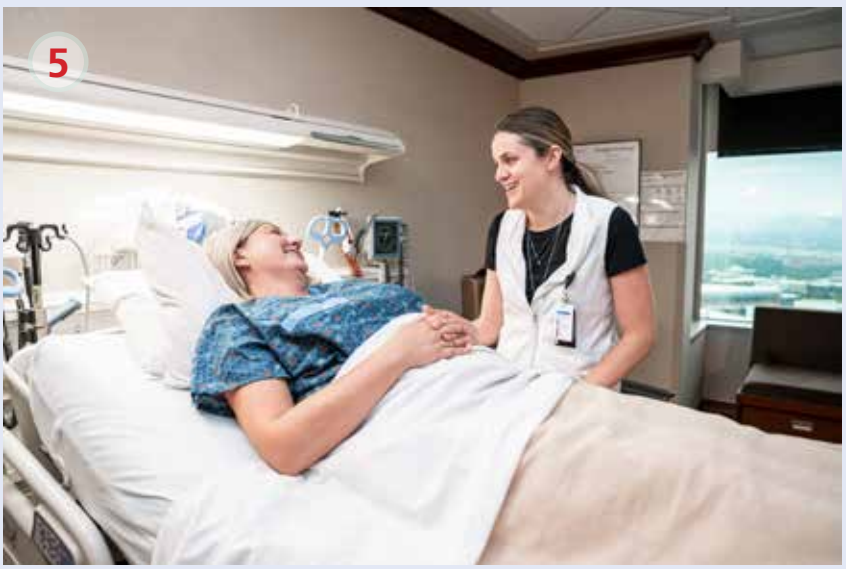
1. *Exterior of HCI Cancer Hospital*
2. *A nurse embraces a patient at Huntsman Cancer Institute*
3. *HCI Cancer Hospital*
4. *A nurse speaks with an infusion patient and their family at Huntsman Cancer Institute*
5. *Huntsman Cancer Institute nurse checks in with one of her patients*
6. *The operating room at Huntsman Cancer Institute*

Noteworthy distinctions:

- Huntsman Cancer Institute is the only NCI Designated Comprehensive Cancer Center in the Mountain West, serving Utah, Idaho, Nevada, Montana, and Wyoming.
- It is a member of the National Comprehensive Cancer Center Network (NCCN) and ranked 33rd for cancer care by U.S. News and World Report Best Cancer Hospitals.
- First in the nation to receive the Pheo Para Alliance Designation, Center of Excellence award.
- Has 237 cancer research teams studying all aspects of cancer, with more than 200 clinical trials open to patients.

Other awards:

- Health Care Merit Construction Project Award Winner – Proton Therapy Center, ENR Mountain States
- CEO Cancer Gold Standard Accreditation (first and only CEO Cancer Gold Standard employer in Utah)

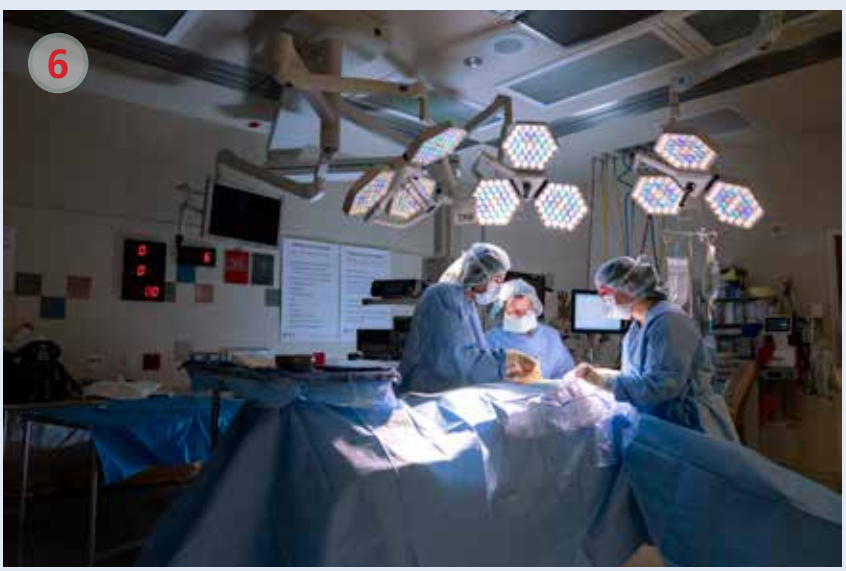


Specialties:

- Huntsman Cancer Institute has 10 disease centers that specialize in adult and pediatric cancer research.
- Breast and gynecologic cancers; gastrointestinal cancers; genitourinary cancers; head and neck cancers; hematological malignancies and hematology; lung cancer; melanoma; neurologic cancers; sarcoma; supportive oncology and survivorship; wellness and integrative health; proton therapy.

Recent developments:

- Huntsman At Home is the world's first cancer hospital-at-home program.
- The Senator Orrin G. Hatch Proton Therapy Center, which opened in 2021, is the first center in the Mountain West to provide proton therapy treatment.
- The Kathryn F. Kirk Center for Comprehensive Cancer Care and Women's Cancers will expand Huntsman Cancer Institute by 220,000 square feet. The expansion will add 48 new patient rooms.



Q&A with Dr. Amit Maity

Chair of radiation oncology Huntsman Cancer Institute

Collaborating for better outcomes

By Gus Iversen

Earlier this year, Huntsman Cancer Institute (HCI) at the University of Utah Health (U of U Health) announced that Dr. Amit Maity would serve as professor and chair of the department of radiation oncology for the Spencer Fox Eccles School of Medicine at University of Utah.

HealthCare Business News checked in with Dr. Maity to learn more about his background in medicine, what drew him to Huntsman, and how the first several months have gone in his new role.

HCB News: Who or what inspired you to pursue a career in cancer treatment?

Dr. Amit Maity: I became very interested in oncology in the 1980s because of all the advances occurring at that time in our understanding of the biology of cancer development. I started a residency in internal medicine with the goal of doing a fellowship in hematology-oncology. However, during my internship I met some 4th-year students who were pursuing radiation oncology and learned about the field. I did rotations in radiation oncology and became fascinated by the field and decide to apply for a second residency after I completed my residency in internal medicine.

HCB News: Can you tell us what your career has been like up to this point?

AM: I began my career in radiation oncology at the University of Pennsylvania. After I completed my residency, I pursued a Ph.D. degree. I then pursued a post-doctoral fellowship at Johns Hopkins and then became a faculty member in the department at Penn. During my time as faculty at Penn I always maintained a wet lab, but I have had many clinical roles. I treated pediatric cancer patients from Children's Hospital of Philadelphia (CHOP) for many years and then switched to treating lung and prostate cancer at the Philadelphia VA. Over the past twelve years I have been treating hematologic malignancies.

During my time at Penn, I have also taken on many different leadership roles including being chief of radiation oncology at the Philadelphia VA Hospital, chair of the Quality Assurance (QA)/Quality Improvement (QI) Committee, vice chair of clinic for the department, and over the past several years executive vice chair of the department. In this latter role I oversaw many aspects of the department including supervising the running of 17 satellite facilities. After these different leadership roles at Penn, the move into a chair position was a natural step for me.

HCB News: What drew you to Huntsman Cancer Institute and University of Utah Health?

AM: As I was interviewing for this position, I realized that Radiation Oncology at U Utah is a phenomenal department that gives exceptional patient care. The faculty and staff there are engaged and genuinely care about improving life in the intermountain region. I did feel that there was an opportunity to further the research that was being conducted in the department, specifically by collaborating with people outside the department. What drew me to Huntsman Cancer Institute and University of Utah Health is that I sensed a real spirit of collegiality and collaboration between clinicians and researchers at both HCI and U Utah Health. Hence, I feel that I will be able to promote research collaborations between faculty in Radiation Oncology and other departments and fields that will yield exciting, novel ideas.

HCB News: How would you describe the leadership style at Huntsman?

AM: I have a very inclusive style of leadership and welcome input from many other people to help me make the best decisions possible. As soon as I started as chair, I established an Executive Leadership Group (ELG) consisting of myself and several other leaders in the department. The ELG meets on a regular basis to discuss important issues facing the department. In addition to these ELG meetings, I have been meeting with every faculty member as well as directors of various groups such as nursing, dosimetry and therapist to better learn the organization and spark new ideas.

HCB News: What are the patient demographics that you're serving in the radiation oncology department?

AM: Although the majority of patients we treat are local, since Huntsman is the only comprehensive cancer center in a 5-state region (Utah, Nevada, Idaho, Wyoming, Montana), as the radiation oncology department at Huntsman we treat many patients who live at a distance. Specifically, we provide specialized radiation treatments that might not be available at centers closer to where many of these patients live; for example, children with cancer, patients who could benefit from proton beam therapy, and radioactive implants for gynecologic malignancies.

HCB News: Are there any special projects or initiatives you're undertaking or planning to undertake?

AM: There is a tremendous opportunity for translational research — advancing novel ideas from the lab into the clinic. Since I started a few months ago, we have had a couple of translational researchers visit the department. This is still a work in progress, but I am hopeful that we can recruit at least one of them.

A major issue the medical field is facing is widespread burnout. The pandemic took a toll on the frontlines of healthcare; hence, there is a state of general dissatisfaction among healthcare workers. Filling open positions, and keeping those positions filled, is an ongoing issue. It is not just an issue of hiring, but of increasing retention by improving the quality of life of our providers. Along these lines, I assigned one of our faculty to be chair of a wellness committee in which representatives from various groups in the department (nursing, dosimetry, billing, etc.) were asked to brainstorm and come up with ideas that could make their lives more fulfilling. Reviewing these suggestions and determining how the department can institute them will be a specific focus over the next few months.

HCB News: What kind of advantages come with being a member of University of Utah Health?

AM: As I mentioned before, belonging to U of U Health can help with collaboration with other departments and groups, such as population sciences, medical informatics, radiology, and medical oncology. But it goes beyond just the healthcare system. Being part of a huge university gives us access to researchers in other areas on campus that would not typically collaborate with radiation oncology, such as bioengineering, material sciences, and applied physics. I believe that fostering collaborative relationships with these disciplines will be mutually beneficial, and this is much easier to achieve at a place like the University of Utah.

I assigned one of our faculty to be chair of a wellness committee in which representatives from various groups in the department (nursing, dosimetry, billing, etc.) were asked to brainstorm and come up with ideas that could make their lives more fulfilling.

HCB News: You took on your new role in early June, has anything surprised you in the first few months?

AM: I had spoken to many people as I was interviewing and over the many months between when I accepted the position and when I started (June 1). Hence, I can honestly say that there have been no surprises; the job is exactly what I thought it would be.

HCB News: Do you see the pandemic altering cancer care in any fundamental, long-term ways?

AM: As a result of the pandemic and limitations on resources, and patients wanting to travel less, many places started to use radiotherapy regimens that required a fewer number of treatments (hypofractionation), often completed within 1-2 weeks (as opposed to 5 weeks or longer, as was the case for many curative cases, which was the standard decades ago). This trend had already been taking place in the radiation oncology field, but the pandemic accelerated this. As things slowly return to normal, I think there will be continued interest in using these regimens. Hypofractionation is an active area of research in clinical trials being conducted worldwide, including our department. This is a more appealing option for patients who live outside of the Wasatch Front.

During the pandemic, many groups turned to working from home. The pandemic forced us to better use remote video platforms, like Zoom and Microsoft Teams. As we return to normal, I foresee that healthcare will be fundamentally changed, in that certain sectors will be allowed to work from home, if not permanently, then perhaps 1-2 days a week. This would obviously not work with staff who must have physical contact with patients to do their job, but we have already seen this in radiation oncology with billing personnel currently doing some of their job from home.

HCB News: What is one of the most important lessons you've learned in your career?

AM: When making an important decision, make sure to get as much information as possible and input from many different people. Sticking with the status quo requires the least amount of effort, but to make any change requires energy. In trying to institute major change, there is often a natural resistance. In these cases, it is especially important to get buy-in from key stakeholders.

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Medical imaging year in review

By Tom Watson

The information and metrics in this summary represent dynamic proprietary data collected from and analyzed for symplr Spend Capital Market Intelligence customers. The depth and breadth of this customer base gives our advisors — industry leaders who provide unbiased, fact-driven data for market trends, vendor solutions, pricing, and support — access to an unparalleled database. These dedicated clinical spend advisors have experience in many areas of diagnostic and therapeutic medical capital technology and markets. They empower customers to make better-informed business, financial, and clinical decisions about capital equipment purchases.

Overview

The overall capital purchasing patterns have changed significantly over the past five years. The data collected and formally analyzed historically has been an excellent representation of the overall, primary healthcare provider mindset regarding medical technology purchase considerations. Using 2018 as the last clear baseline since the COVID-19 pandemic, today we see that the imaging market overall reflects a level of purchasing consideration that is approximately 85% of pre-pandemic capital buying patterns. Based on customer request activity, analyses reflect ranges of pre-pandemic to current capital activity ranging from 60% to 100%. Areas of purchasing/purchase consideration that have recovered to nearly 100% are basic imaging solutions for everyday imaging in general radiology. High-cost advanced imaging recovery is lower, in the 60% to 70% range. By pure volume, ultrasound remains far and away the most active technology area, but even ultrasound has recovered to only about 84% of pre-pandemic levels.

Additional factors have impacted the recovery, including:

- Global and domestic supply chain challenges
- Evolving variants of COVID-19 that continue to command extraordinary, increased operational and staffing resources
- Vendors' strategies to recover losses by increasing prices and making negotiations more challenging
- Increased pressure due to rising workforce costs post-pandemic

Many healthcare organizations have confirmed that their capital budgets are lower today than pre-pandemic. As a result, replacement of aging technology is a major focus. New technology that is a preference rather than a necessity receives increased scrutiny. The key metrics being used for capital decisions include clinical efficacy and proven improved patient outcomes, reduced hospital days, and rapid revenue generation.

Contributing to a "new normal" in capital buying, healthcare organizations now present as a more condensed buyer profile. Partnerships, mergers, and acquisitions (M&A) in the healthcare industry are impacting not only imaging, but the entire spectrum of medical diagnostic and therapeutic capital technology. In response, in Q1 of 2022 many imaging vendors implemented price increases to boost profitability and counter the hurdles they've faced in the prior two-plus years: the rising costs of goods, production, delivery, and support.

According to many customers, healthcare organization consolidation due to M&A activity has also affected vendors' negotiation strategies. April 2022 reflected a clear decision by many vendors to increase prices. In fact, most quotes issued in March 2022 were valid for days or weeks, not months. There's also evidence of increasing pressure on healthcare providers to make the right decisions about whether to make a new purchase, maintain existing technology, or upgrade rather than replace. As a result, the need for an efficient and well-implemented, integrated value analysis process is more important than ever today and going forward.

Overall, the buying patterns relative to specific technology and imaging solutions suggest importance is being placed on highly versatile, mainstream technologies that will provide excellent flexibility but also maximize return on investment (ROI) by providing core functionality. Vendors are still introducing new features and functionality and will continue to do so. However, our review of quotes suggests that it will take longer for new, leading-edge features or capabilities to be adopted and viewed as the mainstream standard of care as measured by clinical efficacy.

Finally, the M&A trend has put pressure on the internal coordination of technologies within healthcare enterprises — both in terms of capital purchases as well as capital equipment service support. As health systems grow in size and complexity, there is a significant need to evaluate existing solutions before making purchasing decisions, creating huge savings opportunities. To capitalize, organizations may need to reorganize and reallocate existing technology before buying another system.

Overall technology-specific customer interest by vendor and key market segments

Many of the following areas were addressed in 2022 HealthCareBusiness News articles contributed by symplr spend advisors. As a result, high-level reviews of the major imaging segments follow.

Interventional X-ray (cardiac, vascular, cardiovascular, neurology)

The technology shows continued high interest in single-plane and ceiling-mounted solutions, as well as a resurgence in specialized solutions for radiology/oncology-focused

systems. Hybrid OR and EP solutions are still a focus but are leveling off. Philips and Siemens lead in terms of customer interest in this area, followed by GE, Canon, and Shimadzu. Three in four customers are considering single-plane solutions over other configurations. Ceiling-mount orientation offerings continue to be the most actively considered, led by Philips and Siemens. Notably, GE has had substantial success with its floor-mounted solutions, primarily due to the company's total focus on the floor-mounted, single-plane market. GE offers no ceiling-mounted single-plane solution. Philips leads in interest in biplane configurations, followed by GE. Siemens Healthineers dominates with its ARTIS pheno for hybrid OR and Canon has limited interest with its dual-plane cardiac/vascular specialty system.

MR

In MR, customers are still primarily interested in mid-field units. symplr Spends Provider Evidence database shows that 77% of quotes submitted for analysis include a 1.5T MR system, 21% include a 3.0T MR system, and 2% include systems below a 1.5T magnet strength. Siemens is the dominant vendor in this market based on new system purchase considerations in both the 1.5T and 3T solution markets. GE is a clear but distant second, trailed by Philips and Canon, respectively.

CT

In CT, the most commonly considered solutions are scanners in the mid-slice range of 120 to 160, which have evolved to offer a wide variety of clinical applications that provide solutions for a wide range of patients. This strategy ensures maximum ROI without compromising the quality of patient care. Of note in this category is the first photon-counting detector solution introduced by Siemens Healthineers, the NAEOTOM Alpha. This is followed by NeuroLogica's FDA-approved OmniTom Elite.

Ultrasound (cardiac, vascular, general, and OB/GYN)

A key driver in the active ultrasound market has been a growing interest in lower-cost, noninvasive, nonionic, and highly portable imaging solutions to supplement traditionally higher-cost, more invasive, and contrast-based procedures. The expansion of ultrasound into truly handheld, point-of-care solutions with special transducers and applications in IOS and Android operating systems has put very good triage-type ultrasound into the physician's pocket. Of all imaging technologies, the ultrasound market is the most diverse, and ranges from large, advanced solutions housed in the ultrasound department to in-house, highly mobile systems for use in surgery, emergency medicine, and at the patient bedside. Ultrasound, by far the most ubiquitous imaging modality in healthcare, also extends to specialized physician offices, which use portable ultrasound in their everyday practices.

General X-ray — Radiographic and radiographic fluoroscopy (RF)

The digital radiography market has remained steady over the past 12 months and is still very competitive between multiple vendors. Since the COVID-19 infection rate has declined in 2022, customer inquiries and purchasing activity for portable X-ray systems has begun to slow. The most active market segment is fixed radiography systems, which are typically replacements for older units. We see equal activity between single and dual detector system purchases depending on patient volumes and budgeting. There is still significant activity for value systems quoted through third-party dealers, which often are purchased for imaging centers, clinics, and smaller facilities. The purchase of flat panel detectors (digital retrofits) has slowed significantly as they are well-established in the market and are typically only replaced due to age or damage.

Purchasing activity for fluoroscopy systems has also remained steady over the past 12 months. Fluoroscopy is a mature market, and the majority of purchases seen are for replacing older equipment. Most of the quoting activity is an even mix of remote and conventional (tableside systems). Remote systems have become more popular over the past few years, especially for facilities with high patient volumes. We see limited activity for multipurpose RF systems, which are often used as overflow rooms for angiography or interventional procedures.

Service contracts and service support

Service continues to be an area that needs focus and oversight, demanding an organized and centralized view of an organization's major medical capital service costs. While change is afoot, historically, service renewals were under the purview of individual clinical departments. This decentralized approach risks automatic renewals without a review or verification of cost — or consideration of whether a technology needs a different level of service or a contracted service at all.

Most service and support contracts are maintained by an original equipment manufacturer (OEM) service. Some may be based on a sole-sourced service vendor that supports multiple OEM technologies on a single contract. The high M&A activity in healthcare has created an opportunity for newly combined health systems to evaluate multiple contracts across the enterprise, choosing variable levels of coverage, variable terms, and variable renewal dates. Consolidating into a single master service agreement (MSA) offers savings opportunities via a coordinated, negotiated agreement; a coordinated term and renewal date, and the opportunity to review and validate the right level of service. Again, in some cases the decision may be to eliminate the service contract across all locations. There are also options for healthcare enterprises to pool imaging components such as detectors, tubes, transducers, and other technology subject to degradation based on volume and procedure protocols.

Regardless of capital budgeting and the need to control costs, it is important for health systems to ensure that major medical service agreements are reviewed for cost, for covered equipment, and more recently for consolidation across an enterprise organization. Savings opportunities such as those outlined here (and others, such as coterminus agreements) remain underevaluated and are worthy of exploration.

About the author: Tom Watson, principal advisor, symplr Spend. With deployments in 9 of 10 U.S. hospitals, symplr is the leader in enterprise healthcare software and services.
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Combating the growing threat of cyberattacks

By Almog Apirion

The past few months have seen a near unprecedented uptick in cyberattacks on hospitals, clinics and healthcare providers. Smaller facilities, which often have fewer resources, have been hit particularly hard by the rapidly evolving waves of cyberattacks. Healthcare providers are left wondering how they can migrate to new systems, all the while ensuring there is no downtime or lag throughout the transition. But with patients' lives at risk, it is crucial that healthcare facilities take the necessary steps to implement next-generation, identity access-based cybersecurity protocols. IT departments looking to upgrade their facilities systems should focus on three major areas: user permissions, third-party access, and phishing schemes.

The reality of healthcare facilities and cyberthreats

From July 2021 to June 2022, more than 42 million patients had their data exposed due to a cyber breach. The subsequent delay in testing caused by these breaches was reported to result in poor patient outcomes and increased complications from medical procedures. More urgently, the same report found cyberattacks directly correlate with an increase in patient mortality rates.

But if cyberattacks are directly affecting patient outcomes, why are so many facilities slow to upgrade their cybersecurity systems? In short, the transition to new cybersecurity systems can be expensive and time consuming. Employees can struggle to learn new systems while maintaining productivity and added security layers have the potential to cause lags in critical networks.

In turn, healthcare facilities need to look for solutions that won't affect day to day operations or cause users significant delays when interacting with the network.

Why healthcare facilities are particularly at risk

The sheer amount of users, applications and services in healthcare who need secure network access can pose problems for hospital cybersecurity teams. And that's not even taking into account that doctors, nurses, care staff, office staff, leadership, and IT, among many other types of users, all likely require different permission levels to very different resources. Keeping track of all of these unique user types and permissions can not only be logistically difficult, but also opens the door for many more users to accidentally compromise a system or introduce a bad actor to the network.

Hospitals are not only forced to maintain security for their own users, but also the third-party vendors they need to interact with on a regular basis. Third-party cyberattacks have become prevalent across numerous industries, not just healthcare. And with companies trusting the responsibility of maintaining third-party security with those same third-party vendors, it's no wonder these types of attacks are so appealing to hackers and bad actors. One only needs to look at last year's ransomware attack on Olympus to see the ramifications and pervasiveness of this type of breach.

When considering the number of users and applications who need access to healthcare networks, the very real threat of phishing attacks opens another entry point for bad actors to compromise a system. Phishing, spear phishing, and the latest versions of SMShing (phishing via SMS) all seek to compromise a user's machine, which would grant the bad actor access to sensitive network locations.

Most users are probably familiar with these types of attacks, which occur when a bad actor sends a user a malicious attachment or link. Attackers can pose as a company executive or supervisor, encouraging employees to click on these links while using company emails or on company networks. In turn, hackers can breach an entire organization.

Moving forward

When taking all of these threats and vulnerabilities into account, healthcare organizations ultimately need to shift toward security systems that can confirm and leverage identity across all of the modes, users, and services that healthcare uses. This approach will ensure that only authorized and verified users are given access to the specific applications, services, or resources they need to do their jobs.

In practice this will look like transitioning from what is likely a perimeter-based security system to one rooted in identity-based access. This one simple step will decrease the chances of a data breach, without compromising the experience for everyday users. In short, identity-based access works under the notion that every user must be authorized every single time they enter a network before being granted access. And further, this approach grants a user or application only the resources a given user needs for their role. In order for healthcare facilities to combat growing cybersecurity threats, organizations need to reevaluate their existing security systems and ensure their updates are rooted in identity-based access.

About the author: Almog Apirion is CEO and co-founder of Cyolo, a company dedicated to introducing the first real zero-trust solution, a safer architecture that allows organizations to securely connect all users to their working environments. Cyolo strives to help organizations stay agile, secure and productive — whatever the situation, wherever their users are located.

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Digital tomosynthesis poised for major growth

By Dr. Michael Yuz

Medical imaging is an ever-evolving discipline. And it isn't uncommon that, with innovation and technical advances, what's old is new again. Keep your eye on the ball!

A case in point is tomosynthesis. Long after its introduction, the modality gained prominence as digital breast tomosythesis (DBTS) in breast cancer screening in 2011. Today, with continued evolution, its use is growing significantly for a wide range of additional clinical applications. Many believe that DTS may just be poised to replace X-ray as the most commonly used imaging modality worldwide for many of these new use cases.

What is so notable about DTS? While DTS relies on an X-ray tube and image receptor, unlike conventional 2D X-ray, DTS is a volumetric modality. It yields far greater information than conventional X-ray, without the cost, mechanical and operational complexities as well as radiation exposure of 3D CT. Helping it along is a recent effort to broaden the modality's accessibility with delivery through a medical scanning as a service (MSaaS) model. This pay-per-scan fee structure eliminates capital equipment expenditures, which is greater than for X-ray, addressing one of the barriers that prevent some practices from adopting the imaging technique.

The DTS MSaaS offering also includes an optional cloud-based teleradiology service using experts in the modality. This eliminates learning curves and allows specialists of every stripe to offer this advanced imaging in-house when needed to boost patient care.

Tomosynthesis: Historical overview

A refresher course: The roots of tomosynthesis date back to the 1930s and geometric tomography. Early tomography devices were an effort to compensate for a major shortcoming of conventional X-ray: projecting a 3D volume on a 2D plane, which superimposes underlying and overlying structures on the region-of-interest and potentially obscures clinically important information. To compensate, early tomography relied on the simultaneous movement of the X-ray tube and detector around a designated point in the patient being imaged. The result was a slice image that sharpened the details of structures closest to the detector, while blurring those further away.

During the years that followed, the advent of the digital detector enabled faster and more sophisticated image capture. New, powerful computers also supported reconstruction of multiple image slices that could be used to synthesize any coronal plane in the body, providing physicians with far greater clinical information.

CT vs. tomosynthesis

The most advanced tomographic imaging modality is CT, which acquires data over a 360-degree rotation around the patient. However, this brings with it design and operational complexities, higher personnel costs and the need for specialized expertise, as well as long scan times.

By contrast, unlike CT, DTS relies on a limited range of angular movement across the patient — often 40 degrees or less. This involves less time and intricacies than CT but limits Z-direction data and isotropic special resolution. However, x-y plane information is often superior to CT and the resulting image is far superior to X-ray.

When CT is not readily available or appropriate, most physicians continue to rely on conventional X-ray. In fact, X-ray is the most commonly used imaging modality overall, accounting for as much as 60% of total imaging volume. However, as DTS evolves and becomes increasingly cost-effective and accessible to medical practices, for a growing number of physicians, it may emerge as a preferable alternative to X-ray, filling the imaging gap. With an MSaaS delivery model, streamlined outsourced interpretation and continued maturation of the modality itself, use is likely to grow.

Interest and use cases expand

A number of well-known medical equipment vendors and innovative smaller firms are focusing renewed efforts on DTS and enhancing its performance. During the 1990s, the introduction of flat-panel digital detectors gave DTS a significant boost in acquisition speed, while reducing image noise and distortion. Today, devices and imaging techniques also are being developed to enhance image quality and support a growing number of clinical applications.

For example, detector-tube geometry of motion has become more varied. In some cases, the two components remain in parallel planes, maintaining fixed positions relative to one another as they move in an arc. Alternately, in other devices, the detector remains stationary as the tube arcs over the patient. Each method has benefits in specific applications.

In addition, reconstruction and depth resolution algorithms are being constantly refined. All reconstruction algorithms compensate for potential anatomic distortion as the arc rotation of objects projected onto the detector plane. Acquisition parameters, including tube movement, angle and number of images, are now being optimized for various clinical uses.

Additionally, because DTS data sets are digital, both computer-aided diagnosis (CAD) and artificial intelligence (AI) can play a role in exam interpretation. With the development of appropriate algorithms, CAD and AI can speed interpretation and potentially enhance results.

About the author: Michael Yuz, M.D., is the founder and CEO of USARAD, a major teleradiology firm.

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Increasing EMS capacity via mobile integrated health

By Keith Algozzine

An estimated 240 million emergency calls are placed to 911 in the United States each year. It's difficult to contemplate, but what would happen if no one was there to help? Workforce shortages and talent gaps have dominated headlines in a post-pandemic job market, and no industry or trade has been spared. The health care industry, including Emergency Medical Services (EMS), has been hit harder than others.

According to a 2021 study centered on paramedics and ambulatory services, organizations reported that 32% of employees planned to depart in the first year of employment, which means that every three to four years, an entire workforce experiences a complete turnover.

This churn rate for emergency medicine personnel also carries a financial impact. Recruiting, screening, and onboarding a full-time EMT adds up — an estimated $6,780 per person. For paramedics, that increases in excess of $9,000 per hire.

What drives such rapid attrition?

One factor pushing this phenomenon is that paramedics and EMTs are looking for new jobs, higher pay, and better benefits. Other factors include that their jobs have become increasingly risky over time, and they are often overburdened as one of few options for health care in many communities, making the workload heavy and spread across fewer individuals.

When a scarcity of EMTs, paramedics, and emergency response units exists, first responders are taken offline and removed from service. Limiting the number of responders can lead to delays in care and dangerously lengthen response times, increasing the already-present jeopardy of those in an urgent situation.

The global pandemic already strained the emergency response infrastructure, and the stress on the EMS labor pool only further exacerbates the associated problems. The fact is, across the country, cities and counties are searching for solutions to maintain and strengthen critical, lifesaving talent and provide the highest level of care for the communities they serve.

Mobile Integrated Health emerging as a solution

The rise and spread of Mobile Integrated Health (MIH) has emerged as an applicable, real-world, and practical solution defined as "a patient-centered, innovative delivery model offering on-demand, needs-based care and preventive services, delivered in the patient's home or mobile environment," MIH has become a valuable tool.

In addition, and in conjunction with MIH, emergency medicine personnel are also utilizing digital health solutions, including digital front doors combined with emergency medicine physicians, Pas and NPs, to provide care. Digital front doors serve as access points for EMTs and paramedics to connect their patients with medical providers virtually via telemedicine, offering additional treatment and consultation for the patient at any hour of the day or night. The digital health provider can solve the patient's problem together with the EMS personnel, and then connect the patient to other virtual services like specialty care or primary care; or they can facilitate referrals to in-person providers or facilities for follow-up work, as needed. This alleviates the burden on the EMS team, freeing up their capacity to handle true emergencies; and ensures that the patients receive a high level of appropriate care.

Importantly, digital front doors, when combined with emergency medicine providers, assist during emergency situations by providing a single hub through which all interactions occur; a single point to provide connection to expert medical providers for consultation, to further assess symptoms virtually, and to monitor a patient's condition remotely.

The combination of MIH, digital solutions, and ER providers, allows EMTs and paramedics to administer care at a patient's location, wherever they are, via the use of telemedicine. This innovative approach is gaining recognition now more than ever for the wide range of benefits it can provide.

Some established benefits of MIH include:

- A reduction in the rate of emergency room visits and hospital readmissions
- Conserving and utilizing time and resources wisely for emergency medical services personnel during critical situations requiring a higher level of care
- Helping recruit and retain EMTs and paramedics by giving them new career paths and inspiration to use their skills to do more than take people to the ER and hospital
- Expanding and providing newer care options to underserved communities

MIH has the potential to create a ripple effect of benefits that both emergency service providers and patients across the country can experience. From saving precious time to reducing financial burdens for all parties involved.

There is no easy fix or simple solution to labor shortages occurring in emergency services, but leveraging MIH alongside digital health will assist to maximize available resources, streamline services, and help first responders tend to the critical needs of their communities. With MIH, patients receive care that will matter and make a difference, and emergency service providers can continue their work to the highest levels of efficiency.

About the author: Keith Algozzine is co-founder and CEO of UCM Digital Health.

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Rene Ragas

Woman's Hospital appoints CEO

Josh Shepherd

Buffalo Hospital and Cambridge Medical Center names president

Dr. Garry Gold

Stanford appoints chair of radiology

Dr. Bonnie Stephens

Community Medical Center appoints chief medical officer

Graciela Gonzalez-Hernandez

Cedars-Sinai appoints new vice chair of computational biomedicine

Jeanna Bamburg

The Woman's Hospital of Texas names CEO

Denyse Bales-Chubb

AdventHealth Palm Coast names president and CEO

Donna Lynne

Denver Health names next CEO

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Interventional X-ray and mobile C-arm equipment markets had a double-digit recovery in 2021

By Bhvita Jani

The world market for Interventional X-ray and mobile C-arm equipment is forecast to reach over $4.9 billion by 2026, according to a new report from Signify Research. The world markets for interventional X-ray systems and mobile C-arms increased by 10.2% and 15.5% respectively in 2021. The markets recovered strongly as the negative impact of the coronavirus pandemic subsided, and delayed orders were fulfilled.

Product trends

In the mobile C-arm market, flat panel detector (FPD) 2D mobile C-arms are forecast to have the fastest growth through to 2026, with a revenue CAGR of 6.5%. Demand for image intensifier systems is being maintained by emerging regions or low-risk applications such as pain management in developed countries. The United States, China, Japan and Western Europe will continue to lead adoption of 3D C-arm technology. However, the penetration of 3D mobile C-arms must overcome barriers in the U.S. market, such as strong preferences for hybrid operating rooms (HORs) and Medtronic's O-arm for spinal surgery, due to favourable reimbursement.

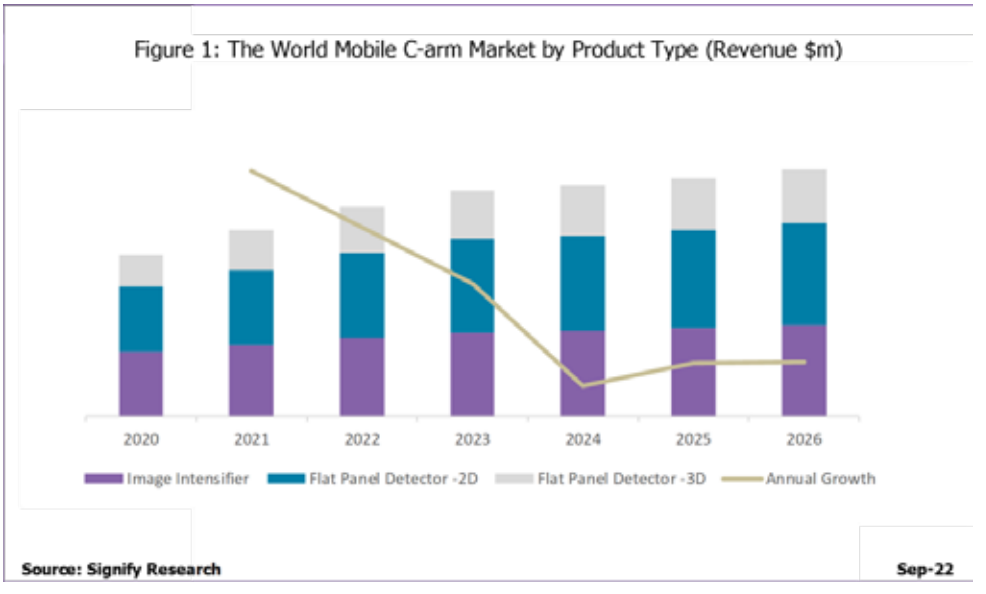
Within the interventional X-ray market, strong growth is projected for the structural heart market, with left atrial appendage closure procedures and mitral valve interventions maintaining clinical demand. Interventional neurology is a key growth area within interventional radiology. The increasing number of stroke centres globally, as well as adoption of biplane systems for multidisciplinary use, for instance for vascular procedures, is driving demand for interventional neurology systems. The primary applications for HORs include cardiac and vascular procedures, followed by spinal procedures.

Regional trends

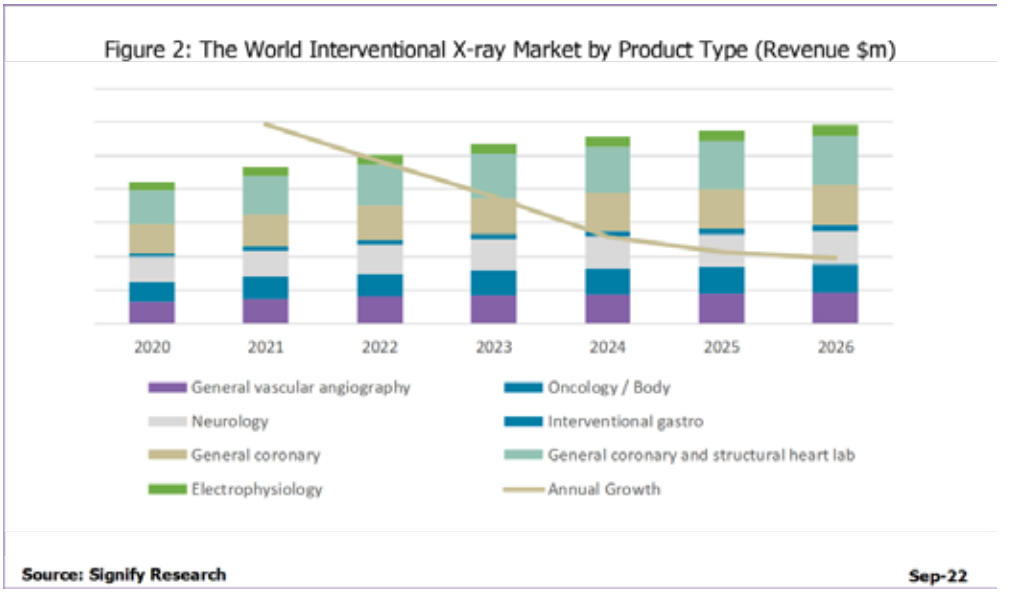
Americas:

- As clinical cases become more complex and interventional X-ray technology becomes more advanced, it is becoming increasingly difficult for interventionalists to gain expertise across all available software and applications.
- An increase in the complexity of interventional procedures maintains demand for high-end solutions, where the required generator power is regulated to ensure patient safety. Most new demand for mobile C-arm technology will be accounted for by outpatient clinics and facilities in the United States.
- Most countries in Latin America have budget constraints and are price-sensitive, so tend to purchase low-end to midrange systems

Figure 1: The World Mobile C-arm Market by Product Type (Revenue $m)



rather than higher-end systems. In Brazil, there has been a transition from image intensifier technology toward midrange and low-end mobile 2D FPD C-arms with basic functionality to support simple surgery. The rest of Latin America has both emerging and developed markets, with pockets of strong growth coming from Columbia, Argentina, and Chile.



EMEA:

- Western European governments are expected to focus on healthcare reforms, cost containment, and increasing return-on-investment throughout the forecast period. Demand for interventional X-ray systems is, therefore, dependent on the expansion of existing healthcare facilities, such as larger, new hospitals to replace older hospitals and new cardiac centres.
- The Western European market has a strong preference for floor-mounted systems. There is a greater uptake of 2D and 3D FPD systems compared to Eastern Europe, with the German market having the highest uptake of 3D C-arms in 2021.
- Higher-specification, higher-cost equipment is typically purchased in Northern Africa and South Africa, while central Africa is predominantly a very low-end interventional X-ray market.
- In Eastern Europe, Poland is forecast to be a growth market as the European structural and investment funds will support healthcare investment over the coming years.

Asia Pacific:

- China is the second largest market for interventional X-ray systems, after the United States. A key growth driver is the rapidly increasing number of Tier 1 hospitals.
- India has one of the best practices for cardiovascular medicine globally, ranking the third highest country for the number of TAVI procedures performed. From a clinical standpoint, the increasing number of stent procedures is facilitating additional growth for cath labs and better utilisation of existing cath labs.
- Demand for image intensifier mobile C-arms is falling in China, with 2D FPD mobile C-arms accounting for most of the market. Strong price erosion due to increased competition amongst local mobile C-arm vendors in China is hindering revenue growth. Low-cost mobile C-arm systems in India tend to fall into the super-value market segment, which accounts for more than 70% of the total mobile C-arm market in India.

Future outlook

In the coming years, market growth for both interventional and surgical X-ray equipment is forecast to be positive, following a year of market retraction in 2020. Beyond the pandemic, the main growth drivers will continue to be the growing burden of chronic diseases owing to changing lifestyles, and the rising need for cost-effective, minimally invasive interventional procedures. The rising prevalence of chronic conditions, such as cancer, heart disease, and others, and advances in minimally invasive, targeted treatments using imaging guidance continue to drive the market. Increasing competition from Asian manufacturers is increasing the affordability and adoption of image-guided therapy systems in emerging countries. The increased demand for complex neurology, oncology and cardiovascular procedures means that hospitals are increasingly prioritising advanced multidisciplinary equipment. Advanced features such as AI, dose management and treatment planning capabilities will increase the uptake of more high-end technology in developed countries. Within the mobile C-arm market, positive growth from 2021 onwards is attributed to the rising geriatric population with a high susceptibility to chronic conditions such as cardiovascular, orthopedic and respiratory diseases. This, alongside increasing patient awareness of the benefits of minimally invasive procedures, is expected to drive the market growth over the forecast period.

About the author: Bhvita Jani is a senior market analyst at Signify Research, an independent supplier of market intelligence and consultancy to the global healthcare technology industry. Its major coverage areas are healthcare IT, medical imaging and digital health. Clients include technology vendors, healthcare providers and payers, management consultants and investors. Signify Research is headquartered in Cranfield, U.K. To find out more visit www.signifyresearch.net

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X-ray Year in Review

The year in X-ray news saw a shortage in contrast availability, innovations in detector technology, increasing AI adoption, new scanners from the leading OEMs and a pivot closer to the tenets of value-based care. Here, in chronological order, are the ten biggest X-ray stories of the year from our Daily News online.

French surgeon tried to sell terrorist attack survivor's X-ray as NFT for over €2,400

A senior orthopedic surgeon in France faced legal action and a disciplinary charge in January for trying to sell an NFT of the X-ray of a woman who survived the 2015 terrorist attack on the Bataclan concert hall in Paris.

The woman, who asked to remain anonymous, was "extremely shocked" to find that Dr. Emmanuel Masmejean at the Georges Pompidou Hospital in Paris was trying to sell her X-ray for €2,446 ($2,727), according to her lawyers. He listed it on the marketing site, OpenSea for sale until February 19.

The image shows the woman's forearm where a Kalashnikov bullet was lodged near the bone. Masmejean offered on the site as an NFT digital artwork (non-fungible token). Using the same data as cryptocurrencies, an NFT is a unit of data, such as digital artwork, that cannot be duplicated. It comes with a unique certificate of ownership that can be applied to any digital creation and means that while a work can be copied, it can only be sold by the owner of the NFT, according to The Guardian.

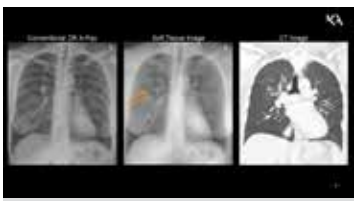
"This doctor, not content with breaking the duty of medical secrecy toward this patient, thought it would be a good idea to describe the private life of this young woman, making her perfectly identifiable," said the woman's lawyer, Elodie Abraham.

Perpetrated by Islamic State (IS) extremists, the Bataclan attack consisted of shootings and bomb attacks that claimed the lives of 130 people on November 13, 2015. One of the dead was the woman's boyfriend at the time.

The sale was canceled, according to Mediapart, which first reported the story.

Masmejean's told Mediapart that the attempted sale was an "error" and that he regretted not seeking permission from the patient.

KA Imaging to manufacture world's first dual-energy mobile X-ray system



KA Imaging in Canada announced in April it was putting up nearly $1.5 million for the creation of the world's first dual-energy mobile X-ray system.

The solution will be equipped with the company's Reveal 35C dual-energy X-ray detector, a portable detector that utilizes dual energy to create three images in a single exposure: a standard chest X-ray, a soft tissue image without bone, and a bone image without soft tissue. It will be the first made-in-Ontario mobile X-ray scanner, with the company investing $1,488,000.

KA Imaging specializes in the development of X-ray imaging technologies and systems, and has 80 global patents. Its use of dual-energy eliminates motion artifacts and captures images in which the bone and soft tissue do not overlap one another, at the same dose as a standard chest X-ray. With these separate images, radiologists can better assess the lungs and soft tissue without bones obstructing their view and vice versa, and can locate lesions or signs of a disease more easily. Because it is portable and retrofittable, it can be used with any existing X-ray system, including point-of-care units at the patient's bedside.

The addition of dual-energy capabilities is expected to increase the system's diagnostic capacity and make it helpful for assessing critical care patients and those in rural and remote communities where access to X-ray machines, CT scanners and MRs is limited.

"Something that shows up in the bone image most likely is calcified, like a calcified nodule, a calcified artery, a calcified vessel; and something that shows up in the soft tissue is soft tissue. In regular X-ray, you have to guess if a nodule is calcified or not. By material discrimination, you add an additional layer of analysis and data for the clinician, and it allows the clinician to make a better decision than they would if they were just looking at regular X-ray imaging, mobile or fixed," Dr. Karim Karim, founder and CTO of KA Imaging, told HCB News.

GE Healthcare inks 10-year radiology equipment deal with NHS Hampshire Hospitals in UK

GE Healthcare agreed in April to supply Hampshire Hospitals NHS Foundation Trust (HHFT) in the U.K. with equipment for 10 years to enhance the quality of its radiology services and patient care.

The company will provide radiology managed service (RMS) for 120 pieces of equipment, a command center and an oncology cockpit to speed up cancer diagnosis. It will oversee the installation and maintenance of radiology equipment including MR, CT and ultrasound.

The deal applies to all hospitals under HHFT, including Andover War Memorial Hospital, Basingstoke and North Hampshire Hospital, and Royal Hampshire County Hospital in Winchester. Together, they serve 600,000 people, according to the Andover Advertiser.

"Our vision is to provide outstanding care for every patient. To do that we need to bring innovation and investment into our hospitals and our clinical teams. "This partnership will not only give us access to advanced radiology equipment, but it will also enable faster, more accurate diagnosis and reduce waiting times for patients," Alex Whitfield, chief executive of the Hampshire Hospitals NHS Foundation Trust, said in a statement.

HHFT expects the partnership to aid in its objective to find and deliver faster diagnoses to patients. The healthcare system will use GE's oncology cockpit to keep track of diagnostic demand and capacity constraints and to help staff avoid potential delays in cancer care. It also will use it to simplify patient workflow, reduce waste and enable faster diagnoses.

Additionally, GE will extract and integrate data from scanners and radiological information systems to create visuals of the imaging pathway from referral to report. This will help the hospitals better manage their clinical, operational and financial outcomes, as well as optimize the capacity and performance of every piece of equipment and the system as a whole. The result will be a streamlined patient pathway, with HHFT's radiologists able to provide better outcomes to patients.

In midst of shortage, GE Healthcare ramps up production of contrast agents

In May, GE Healthcare upped the output of its contrast agents following the temporary suspension of operations at its Shanghai factory where all concentrations of its Omnipaque (iohexol) tracers were produced.

Lasting several weeks, the suspension was initiated due to the COVID-19 lockdown in the city at the end of March 2022. While the factory has reopened and is ramping up production, the company expects there to be an 80% reduction in supplies for the next six to eight weeks. To offset the shortage, it has increased production at its factory in Ireland and is shipping products by air rather than sea from both factories to accelerate deliveries, reports Reuters.

"We are working around the clock to expand capacity of our iodinated contrast media products," a GE spokesperson said after the company closed its Shanghai facility for several weeks. "We are working to return to full capacity as soon as local authorities allow."

Omnipaque is used in CT, X-ray, and radiography, including for myelography (lumbar, thoracic, cervical, total columnar exams) as well as cisternography and ventriculography. The company has four contrast media manufacturing facilities, including the one in Shanghai. The shortage of Omnipaque and other agents produced there has limited supplies worldwide, including at some of the largest U.S. hospitals, such as Cleveland Clinic, Kaiser Permanente, Mayo Clinic, and Providence in Washington state.

While the Cork factory in Ireland is helping prevent delays in dye delivery, a Providence spokesperson told Reuters that production there would only cover about 20% of normal supply to all customers through the end of June. Most of the U.S. supply comes from Shanghai. As a result, the hospital is prioritizing existing supplies for critical cases such as stroke, trauma, acute aortic syndrome, new cancer diagnoses, pulmonary embolism and acute coronary syndrome.

The effects are also being felt in Europe, where the Association of German Hospitals told Reuters that GE alerted one of its members that its contrast agent could go out of stock in June due to the situation in Shanghai, according to Reuters.

Contrast agent shortage forcing some imaging rationing in US

In May, hospitals started to scramble as a contrast agent shortage from the Shanghai shutdown is disrupting supplies.

The GE plant there supplies contrast to roughly half of U.S. hospitals and imaging centers, Nancy Foster, vice president of quality and patient safety policy at the American Hospital Association, estimated to NBC news.

"There are a lot of conversations underway at the national level about how you appropriately diversify sources of critically needed supplies so that a weather event, a political event, something else that happens does not wipe out your ability to have access to that supply" Foster added, noting that this latest challenge underscores that, "we need a coming-together of all the manufacturers, the providers, the federal agencies to think through: How do we create that more resilient supply chain?"

The crunch is causing rationing of nonurgent procedures.

"It's very difficult to know what harms are going to occur from this, either from a delayed diagnosis or a misdiagnosis," Dr. Matthew Davenport, vice chair of the American College of Radiology commission on quality and safety, told the news site, advising that he is "confident that there will be some delayed diagnoses or misdiagnoses because we are using imaging techniques that are not optimized, not perfect."

According to a new report in the journal Radiology, out May 19, this contrast crunch is just the latest warning of challenges to be faced across the entire healthcare supply chain.

"We are facing issues similar to those we faced in the early days of the COVID-19 pandemic, caused by a limited supply of an important pharmaceutical, critical to our ability to care for our patients," warned Dr. Thomas M. Grist, chair of the Department of Radiology at the University of Wisconsin School of Medicine and Public Health in Madison, and lead author of the report.

He did note that the healthcare ecosystem is now "more adept at establishing incident command centers to implement rapid responses to the challenges we face" than earlier.

National Academies proposes $100 million per year program investigating low-dose radiation effects

The National Academies of Science, Engineering and Medicine announced in June that a $100 million national research program is needed to investigate the effects of low-dose radiation on risks for cancer, cardiovascular disease, neurological disorders and other conditions.

In a report by the Committee on Developing a Long-Term Strategy for Low-Dose Radiation Research in the United States, NASEM says the program would support epidemiological and biological research on dose, dose rates, types of radiation and exposure duration and their impacts on health. It also would have greater computing power, genetic research and data sharing capabilities, and require $100 million annually over 15 years.

Low-dose exposure is present in many industries but not well understood. This has raised concerns, including about protection against it in medical imaging. "This is especially important as science seeks to provide answers to concerned individuals and to communities that have been involuntarily exposed to radiation, including indigenous communities, atomic veterans, nuclear workers, and others impacted by the legacy of U.S. nuclear weapons testing and production." said Joe Gray, professor emeritus of laboratory medicine at the University of California, San Francisco, and chair of the committee, in a statement.

Lack of leadership, coordination and strategic prioritization has limited U.S. research on low-dose radiation effects. In their study, the committee says the Department of Energy could oversee strategic computation and modeling research, while the National Institutes of Health could manage epidemiological and biological research.

New tools for detecting radiation and precisely characterizing cell and tissue changes would be needed. Various databases would also be required, and researchers would need access to low-dose exposure facilities.

Sustained investments over more than 10 years would be needed to maintain the program. With funding, the DOE could have most of it operational within two years.

Intermountain and Siemens enter 10-year outpatient imaging partnership

As part of a 10-year value partnership, Intermountain Healthcare company Tellica Imaging opened three outpatient imaging centers in Utah, equipped with MR and CT technology from Siemens Healthineers in June.

The centers — in Ogden, Orem, and West Valley/Taylorsville — are the first of several, with an additional five facilities slated to open later in 2022.

"This partnership allows us to offer exceptional clinical care outside of the hospital and in an outpatient setting via the latest medical technology, providing our patients with a potentially faster, more affordable, and more easily accessible option for care," said Nannette Berensen, vice president and chief operating officer of clinical shared services at Intermountain Healthcare, in a statement.

Intermountain launched Tellica Imaging in October 2021, with the intent of opening stand-alone outpatient imaging centers that offered services at flat-rate costs, below those of hospital-based imaging. The company announced at the time that it expected to hire approximately 20 employees to manage all three centers.

"While hospital-based imaging services remain an important part of the care process, particularly in emergency situations and when complex imaging services are needed, many patients prefer to access CT scan and MR imaging services in convenient settings closer to home," said Berensen at the time of Tellica Imaging's launch.

The outpatient settings are especially beneficial to patients with insurers such as UnitedHealthGroup, Anthem, and Cigna, which have stopped covering outpatient MR and CT scans in hospital settings over the last few years in an effort to push patients toward lower-cost stand-alone facilities. National research shows that outpatient imaging is often more accessible and affordable. Anthem adjusted its policy last summer to cover children under 19 for imaging in hospitals.

Konica Minolta adds glassless detector, motion visualization to mobile X-ray

Konica Minolta Healthcare Americas announced in July it would be integrating its Dynamic Digital Radiography technology, designed to visualize anatomy in motion, along with its new AeroDR Glassless High Definition Detector into its mKDR Xpress Mobile X-ray System.

Used at the bedside and in the ER, OR, CCU and ICU, the mKDR Xpress uses a tube-mounted graphic user interface and image preview function to produce clear images that can be viewed quickly. DDR acquires individual digital images at high speeds and low dose and creates a cine loop that shows up to 40 seconds of anatomy in motion. This capability will enable mKDR Xpress users to observe and evaluate the dynamic interaction of anatomical structures with physiological changes over time.

They can obtain both static and dynamic images. The solution is especially helpful for diagnosing and monitoring pulmonary disease and orthopedic conditions, said Guillermo Sander, marketing director for digital radiography at Konica Minolta Healthcare, in a statement. "It is the only technology of its kind available today and in portable

imaging; X-ray in motion is only possible on the mKDR Xpress."

The mKDR Xpress' slim design and collapsible column allow it to fit into tight spaces and move around easily. It also has on-board charging for two detectors, front and back storage for them, and accessories to help in demanding mobile X-ray procedures.

Konica Minolta is expanding on this ease of use with the AeroDR Glassless Flat Panel Detector. At 4.2 lbs., including with the built-in power cell, the wireless panel weighs 27% less than previous AeroDR Flat Panel Detectors, and still provides the same image resolution and sharpness. Its pixel size is the smallest in the world at 100µm, and it has a high detective quantum efficiency (DQE) for assessing fine and small structures.

Its glassless substrate replaces a glass-based substrate, and it also has excellent drop impact resistance, an antibacterial carbon enclosure, and can be used for up to eight hours after charging. Intelligent Grid for grid-less imaging and tube and gauze image enhancement with REALISM make it suitable for surgical imaging applications.

GE Healthcare debuts fixed X-ray system, Definium 656 HD

GE Healthcare launched its next-generation fixed X-ray system, Definium 656 HD, in August. The system is designed to automate and simplify the radiology exam process.

The overhead tube suspension scanner automates its position in the room to speed up exams and reduce manual tasks, while still producing quality images and avoiding the need for repeat scans.

It is designed to be a "personal assistant" to the technologist, allowing them to spend more time with patients, according to Tanya Lancaster, general manager for fixed X-ray at GE Healthcare. "While addressing some of the key challenges the technologist and radiologist face, Definium 656 HD can help improve department efficiency along with staff and patient experience," she said in a statement.

Technologists, radiologists and radiology administrators often deal with heavy lifting, repetitive motion and long hours due to the increasing caseload of X-ray exams. This puts them at risk for musculoskeletal disorders and raises repeat and reject rates as high as 25%.

Definium 656 HD's AutoRad software reduces these manual steps and clicks, while its 5-axis motorization and auto-positioning eliminates the need for personnel to move and position the system. Additionally, the tube head console has a 12" touch screen for automated in-room workflows.

The scanner's Intelligent Workflow Suite utilizes 3D camera technology to generate consistent images to prevent the need for repeat scans. Anatomical details are captured and enhanced with artificial intelligence available on its Helix 2.2 advanced image processing software and with the use of GE's 100 um FlashPad HD high-resolution detectors, regardless of dose, patient positioning, field of view and metal.

The system also has Auto Image Paste at the table and wall stand, which, along with its AutoSpine software, enables fast, precise stitching of long images. And its VolumeRAD Digital Tomosynthesis technology produces multilevel image slices that provide additional diagnostic information.

"This new offering enables healthcare providers to benefit from the highest levels of motorization, automation, assistive intelligence, and advanced applications offered to date in GE Healthcare's fixed X-ray portfolio," said Lancaster. "Not only does this system provide optimal image quality, but it can also reduce the physical workload for technologists and streamline the overall exam workflow."

Orthopedic surgeon gets seven years for medically unnecessary X-rays

An orthopedic surgeon is behind bars for the next seven years for defrauding Medicare and Medi-Cal, the Medicaid program in California, by administering excessive and medically unjustifiable X-rays.

Between 2012 and 2016, Dr. Gary Wisner, who practiced in Lodi, subjected 10 patients to unnecessary exams during routine visits. He scanned multiple parts of the body, even when the patient's condition did not require it, said California Attorney General Rob Bonta.

The California Department of Justice discovered the abuses while examining files from 26,000 individuals under his care. Wisner was convicted in June and sentenced in Sacramento Superior Court on September 2, reported The Sacramento Bee.

"Gary Wisner used both his patients and state resources to line his own pockets. Due to his dishonest behavior, patients at his clinic had to undergo unnecessary medical tests so he could steal from the state's Medi-Cal funds," said Bonta in a statement.

Because multiple government agencies suspected that Wisner was overbilling the Medi-Cal and Medicare programs, the state Justice Department's Division of Medi-Cal Fraud and Elder Abuse worked with the U.S. Department of Health and Human Services, the San Joaquin County District Attorney's Office, and the California Department of Insurance on the case against him.

The ten patients were randomly selected by the California Justice Department from all his patients in their investigation. Their files contained hundreds of unnecessary X-rays.

"This sentence reaffirms what we know to be true: Abuse of power by medical practitioners will never be tolerated within our state's healthcare system," said Bonta.

Wisner is also the subject of an independent criminal complaint filed by the San Joaquin County District Attorney's Office for workers' compensation fraud. That case is still pending.

The federal government and the state of California fund Medi-Cal. The Division of Medi-Cal Fraud and Elder Abuse received three-quarters of its 2021-2022 funding, a total of $50.5 million, from an HHS grant.

The Medi-Cal fraud division often relies upon whistleblowers to report fraud, but it was not specified if this was what led to the investigation into Wisner's conduct.

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Q&A with Dr. Bruce Haffty

President of the RSNA

Discussing radiology's big event

By Gus Iversen

With the annual Radiological Society of North America meeting just weeks away, HealthCare Business News checked in with president, Dr. Bruce Haffty, to find out more about his career. We also talked about what attendees can expect at the upcoming meeting at McCormick Place in Chicago.

HCB News: Who or what inspired you to pursue a career in healthcare?

Dr. Bruce Haffty: With a strong interest in science, I always had some interest in healthcare. After getting my degree in biomedical engineering and working in a hospital environment, my commitment to a medical career solidified, and I ultimately went to medical school.

HCB News: Why did you focus on radiology?

BH: My career choice was radiation oncology because of my interest in patient contact paired with the combination of biological, physics and engineering principles in the specialty of radiation oncology.

HCB News: Can you tell us about some of your career milestones?

BH: I consider my career to be a journey with a number of milestones. Obviously, graduation from medical school and completion of my residency are major milestones. Other milestones included completion of some clinical trials with which I have been involved, as well as leadership opportunities I have had the chance to experience with the American Board of Radiology, ASTRO, the American Radium Society and now RSNA.

HCB News: What has your history with the RSNA been like?

BH: My involvement with RSNA has been a wonderful experience. Prior to serving on the board, I was involved with a number of committees including the BOOST (Bolstering Oncoradiologic and Oncoradiotherapeutic Skills for Tomorrow) program which was very successful. In addition, I had delivered the Annual Oration in Radiation Oncology and also was honored to receive the Outstanding Educator Award. My most recent history, serving on the board of directors, and now as president, has given me an appreciation of how much RSNA means to the house of radiology throughout the world.

HCB News: As a leader of the society, what have been some of your top initiatives or priorities?

BH: One of my top priorities has been raising the profile and appreciation of all that RSNA has to offer throughout the greater medical community and among patients. While RSNA clearly has a significant and dominant profile in radiology, I want patients and our multidisciplinary doctors throughout medicine to appreciate what RSNA has to offer.

HCB News: Are there events or presentations you are most looking forward to at this year›s meeting?

BH: I always look forward to the cutting-edge science presented at the meeting. I'm also excited about the plenary sessions, which revolve around the patient experience, and one of our featured plenary speakers: Dr. Siddhartha Mukherjee, Pulitzer prize-winning author of *The Emperor of All Maladies: A Biography of Cancer*. There will also be an important discussion among notable policy experts on the future of Medicare, with a focus on radiology/radiation oncology: *Medicare and U.S. Healthcare Policy: A National Conversation*. That's sure to be very interesting.

HCB News: What topics do you expect will dominate conversations among show attendees this year?

BH: Artificial intelligence continues to be a hot topic. I hope the theme of this year's meeting around the patient and multidisciplinary partners working together resonates, and people appreciate the patient-centered theme of the meeting.

HCB News: Why should young radiology professionals today consider joining RSNA?

BH: RSNA offers a wide variety of educational opportunities throughout the year. The RSNA annual meeting remains the preeminent forum for radiology throughout the world. In addition to the high-quality scientific content and educational sessions that are among the most outstanding content available in radiology, the networking opportunities and exhibit hall opportunities to see the latest available technology are second to none.

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AFC INDUSTRIES – Booth 1605

AFC's height-adjustable standing desks, with monitor mounts, CPU holders, and wire-management are designed for a home or office work environment. They also provide convenient programmable height level settings and preferences at the simple push of a button. Built to accommodate the heavy professional monitors needed when inspecting radiology images and scans.

These workstations are available in multiple desktop work surface widths, so that they will easily fit in your dedicated workspace, whether it is in the comfort of your home office or at your workplace. With available monitor mounting solutions, we can build this station to accommodate as little or as many monitors as you desire. https://afcindustries.com/all-standing-desk/

Agfa HeathCare | Agfa Radiology Solutions – Booth 2553

Please join Agfa Radiology Solutions at RSNA 2022, Booth # 2553 to experience our groundbreaking, intelligent solutions that 'Empower X-ray Experts' by providing smart, meaningful answers to radiology's real needs.

Visitors to Agfa's booth can discover the ground-breaking DR 100s, including the latest additions that make it even easier to use. Agfa will also highlight VALORY, delivering 'Excellence. Pure and Simple.', with MUSICA® Powered ceiling-suspended and floor-mounted X-ray rooms; the intelligent and dynamic DR 800, now with digital subtraction angiography; the trailblazing SmartXR artificial intelligence portfolio; and the new Dura-line family of robust, reliable and cost-effective detectors.
https://medimg.agfa.com/main/direct-radiography/

Alpha Source Group – South Hall A, Booth 3613

Alpha Source Group (ASG), a leading service, repair, and parts provider for OEMs and healthcare providers, will showcase its newest capabilities and partnership benefits at RSNA 2022. ASG is reinventing the healthcare industry's technical services, depot services, and parts supply chain with its customized solutions. The breadth of healthcare segments served, and the depth of capabilities allow ASG to deliver parts and services faster and more flexibly. Modalities include PET, PET/CT, CT, MRI, NM, SPECT, SPECT/CT, BMD, and Ultrasound. For attendees looking to learn more about extending the life and value of their medical equipment, visit us at booth 3613 or alphasource.com.

Ampronix

Ampronix has been the LEADER in Medical Imaging Technology since 1982. We Offer the Latest Medical Equipment such as 5MP - 12MP Mammo Displays, Clinical Review Monitors, Printers, Media, Surgical Monitors, Cath Lab Monitors, Protection Screens, Medical Recorders, Ultrasound Machines, & Video Signal Converters. We offer (FREE) Service & Repair Evaluations currently & support brands such as Barco, Eizo, LG, JVC, NDS, Sony, Olympus. Ampronix was recently awarded the "President's E-Award," the highest honor given to U.S. exporters and Exporter of the Year for Orange County, California. Currently exporting to 154+ countries, Ampronix has been active supporting Hospitals & Distributors since our inception. Contact US Today for Premier Pricing at info@ampronix.com or at 949-273-8000.

Block Imaging – South Hall A, Booth 1700

Block Imaging offers refurbished system sales, field service, replacement parts, and mobile system rentals for all manufacturers and models of medical imaging equipment. The Block team is based in their Holt, MI headquarters, which are also home to their refurbishment center, worldwide shipping operation, and an inventory of over 35,000 spare parts. In addition to equipment solutions, Block Imaging offers project management, warranties, and financing options for a true turnkey experience. Through this range of services, Block Imaging extends the life of medical imaging equipment so healthcare providers can extend the lives of patients. Visit: blockimaging.com

Chicago Medical Exchange Inc.

Chicago Medical Exchange Inc. (ChicagoMedX) has been in business for over 18 years and is one of the leading refurbishment companies in the medical imaging equipment field. Our commitment to customer satisfaction is second to none. We believe in building relationships with our clients based on a win-win scenario for both parties.

With over 45 years experience in imaging equipment, we can offer our clients New & Refurbished equipment, parts, and provide extended service. We provide a complete turnkey solution for all of the products that we sell, to include site specific drawings, project management, delivery, rigging, installation, applications training, and warranty.

CryoSRV – South Hall A, Booth 2007

CryoSRV is an independent M.R.I. cryogenic parts and service organization focused on providing a high-value alternative for re-manufactured parts, innovative service solutions, the piece of mind of our unique remote Magnet Monitoring solution. We have an extensive repair and test process that ensures unmatched quality and reliability.
Visit: www.cryosrv.com

DetectedX – North Hall B, Booth 7951

DetectedX will showcase its recently launched Radiology Online Learning Platform at RSNA. Designed to improve radiologists' ability to correctly detect breast lesions in 2D and 3D Mammography, the online self-assessment modules have been shown to improve cancer detection by over 34 percent. DetectedX will feature the next generation of its intelligent interactive educational platform, which features micro-learning tools, including quizzes and expanded educational content and videos. The new learning tools will feature new breast and lung educational content, as well as Medical Physics, Radiation and Artificial Intelligence topics. For more information or to schedule an appointment, visit detectedx.com/rsna
Visit: detectedx.com/rsna

Dunlee – South Hall A, Booth 2911

Visit us to see Dunlee's new, integrated cone beam CT bundle created for the specific needs of image guidance in radiation therapy, featuring an X-ray tube, flat panel detector, anti-scatter grid and all necessary cables. The booth also highlights the advantages of liquid metal bearing (LMB) tubes, Invivo Sentinelle breast coils, and Dunlee's replacement CT tubes. Experts on additive manufacturing using tungsten will be on hand to help you determine if 3D printing with tungsten can help you cost-effectively and sustainably produce high-quality components, including low-cost prototyping and mass production. Learn more about all our innovative solutions for CT, X-ray and MR at booth #2911.
www.dunlee.com

ETS-Lindgren – Booth 3147

With over 50,000 RF Shielded installations globally, ETS-Lindgren continues its reputation as an industry leader with innovative products and services for MRI Shielding. "We especially appreciate supporting RSNA because the attendees are as passionate about MRI facility design as we are at ETS-Lindgren," said Joel Kellogg, ETS-Lindgren's Director of Business Development for Healthcare, Industry, and Government. "ETS-Lindgren is committed to partnering with RSNA's medical imaging professionals as we value collaborating with industry leaders. We share the same goal of designing products and services that ensure optimal operation of imaging equipment as well as the highest level of staff and patient comfort."

Visitors to ETS-Lindgren's booth will see examples of the innovative EVO™ Series of MRI RF Shielded Doors and ClearShield™ RF Shielded Windows, including the new convertible S-Glass™, which offers transparent- to-opaque privacy views with a simple flip of a switch. We invite you to speak with our specialists during RSNA to hear about the customized programs we offer for service and maintenance programs to protect your RF Shielding investment and minimize downtime in your MRI suite. Our engineering services include site planning and site surveys for acoustic and vibration analyses as well. Rest assured that ETS-Lindgren will provide continued support through its six manufacturing factories and team of more than 700 employees worldwide. With its wide variety of industry-leading MRI shielding products and services, as well as decades of experience, ETS-Lindgren is the natural choice of medical imaging professionals. In short, ETS-Lindgren is Committed to Enhancing Patient Experiences and Outcomes.
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JVC Healthcare – Booth 1548

JVC, a highly recognized and trusted brand. We continue to expand its footprint to the Radiology, Pathology, OR market and the entire healthcare market.

When all products are quintessentially similar, discerning one from another is more difficult. While the JVC medical display product lines come to prove its supremacy on the performance. They are loaded with useful features, new-patented technology and invention for a superb experience for the radiologists. Headquartered in Yokohama, Japan, JVC has sales offices and services facilities in the North America, EMEA and Asia

KA Imaging – North Hall B, Booth 7948

KA Imaging is introducing the Reveal™ Mobile System. Powered by patented SpectralDR™ technology, the System operates with the Reveal™ 35C detector, which is also sold as a retrofit solution. KA Imaging's SpectralDR™ technology enables dual-energy subtraction, providing bone and tissue differentiation with a single standard X-ray exposure. The technology uses identical clinical techniques associated with state-of-the-art mobile DR X-ray, and reduces patient dose due to the industry leading DQE of the Reveal 35C detector. The Reveal 35C is FDA cleared. The Reveal Mobile System is not available for sale. The company will be at RSNA at booth 7948 in the North Hall.
Visit: www.kaimaging.com

LINAK U.S. Inc. – South Hall A, Booth 2707

For more than 30 years, LINAK has provided powerful, reliable, and safe movement to medically approved actuator systems for healthcare applications around the world. Modern imaging equipment is required to perform extremely precise positioning. The key to providing this is a combination of sufficient power and advanced control systems capable of performing multiple adjustment tasks simultaneously. The LINAK booth will feature the LC lifting column family that sets the standard for vertical lifting columns used in high-end medical applications.
Visit: linak.us/rsna2022

MAVIG – South Hall A, Booth 3129

X-Ray Protection and Medical Suspension Systems - Founded in 1921, 100% family-owned and owner-managed, Made In Germany.

Personal Radiation Protection Equipment – Healthcare Providers and Patients: From glasses, goggles and visors, thyroid protection to an extensive choice of protective clothing and patient protection.

On-site X-Ray Protection: Mobile shields, ceiling-mounted shields and lower body radiation protection mounted onto imaging tables.

Ceiling Suspension Systems for Medical Equipment: Two different systems to choose from that allow for easy positioning of MAVIG medical equipment such as radiation protection screens, lights or monitors.

New MRI Compatible Ceiling Suspension System: Suitable for MRI Injectors, MRI Injector Holders, MRI Monitors.

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Visit: mavig.com

Medimaps Group – South Hall A, Booth 3955

Medimaps: Providing The Full "Bone-Health" Picture. Osteoporotic fractures occur every 3 seconds; current diagnostics only tell half the picture – missing patients. Bone mineral density (BMD) measures bone quantity but not bone structural quality. Together, Trabecular Bone Score (TBS) plus BMD provide the full "Bone-Health" picture. A $40 reimbursable test can save billions in fracture/osteoporosis care.

MEDIMAPS GROUP, specializing in imaging software for assessing bone health, will demonstrate its TBS software (Booth #3955 - South Hall Level 3) and present new radiologist survey findings at its Innovation Showcase (28-November, 11:30 am).

Book a TBS Demo: https://bit.ly/3PFpNug .

Visit: medimapsgroup.com

Medinformatix – Booths 6300 and 6500

The delivery of quality, affordable healthcare depends on physicians and practices engaging intuitively with the patients they serve. Enterprise technology is driving this engagement and MedInformatix is at the forefront of enterprise-wide innovation in healthcare.

At RSNA 2022, MedInformatix is featuring a suite of NextGen mobile applications that connect patients and providers for a better healthcare experience for everyone involved. Built on Radiology's most powerful RIS, the apps strengthen relationships, streamline processes, advance industry initiatives and improve profitability. Also featured is the MedInformatix RIS-RCM Platform, the only industry solution operating on one platform featuring one database backed by *one dedicated support team.*

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MICRO-X – North Hall B, Booth 7161

The core of Micro-X is our Nano Electronic X-ray Technology, enabling x-ray tubes to become miniature, our booth explains NEX Technology and the exciting projects that arise because of this:

- A mini–head CT scanner, enabling us to bring stroke care to the patient, small enough to fit in any ambulance, saving time in diagnosis and treatment of stroke.
- The Rover, with exceptional X-ray quality and ultra-portable design, we now introduce the Rover Plus, for those exams that need a little bit more power.
- In the security segment - Checkpoints designed for use in airports and the Argus X-ray camera.

Visit: rover.micro-x.com

Mindray – North Hall, Booth 7920

Mindray is a global leader and developer of healthcare technologies and solutions for ultrasound, anesthesia, and patient monitoring. Our comprehensive portfolio of Radiology ultrasound machines provides leading-edge technology and everyday tools that meet the diverse demands of your department and the evolving needs of your patient population. Our ultrasound solutions provide crystal clear ploppable imaging, color sensitivity with little flash artifact, and easy-to-use advanced technology to ensure radiologists have the information needed to provide confident answers and diagnoses. Explore our offerings and industry-leading investment protection at RSNA and see how leading-edge technology is financially accessible.
Visit: mindraynorthamerica.com

Mirion Dosimetry Services – North Hall B, Booth 6525

Mirion Dosimetry Services, a Mirion Medical Company, is a leading global provider of occupational dosimetry products and services, and a serial innovator in the development of advanced personal radiation monitoring solutions. Our dosimetry products and services better the human condition by removing the worry of radiation from the daily routines of those who are occupationally exposed. With the breakthrough of Instadose® wireless dosimeters, on-demand dose reads via mobile device or PC, automatic calendar-set dose reads, online badge reassignments, and high dose email alerts help to increase dosimetry compliance and lower dose exposure for at-risk employees with ease, while eliminating the

collection/return/redistribution badge processing cycle to save both time and money.
Visit: www.instadose.com

Nationwide Imaging Services – North Hall B, Booth 6761

Nationwide Imaging Services is an MXR Imaging Company. MXR Imaging, Inc. is the largest independent distributor of imaging sales and service in the U.S. As an industry leader, we provide a wide variety of New and Platinum Certified Pre-Owned imaging equipment. Additionally, we offer service support, legacy equipment assistance, equipment relocation, mobile rentals, parts, training, and radiology consumable/durable goods to the healthcare market. MXR possesses an extensive imaging portfolio which includes: CT, PET/CT, MRI, Ultrasound, General Radiology Imaging equipment, and PACS.
Visit: nationwideimaging.com

OneMedNet – South Hall A, Booth 4929

OneMedNet provides research and regulatory-ready, imaging-centric RWD from our growing 200+ healthcare provider network. No matter the complexity, the specificity, or the diversity – we curate and present the right data, at the right time, in the right format to Life Science Innovators.

Please join us in the AI Theater for a joint presentation featuring Jeffrey Yu, M.D. and Angeline Cosca (CIO at Steinberg Diagnostic Medical Imaging Centers). It's entitled, "Regulatory-Grade Imaging RWD Considerations and Impact – Provider Insights" and will take place at 1pm on Tuesday, November 29th.
Visit: www.onemednet.com

Parker Medical, Inc. – North Hall, Booth 7909

Parker, a global leader in X-ray imaging components, subsystem & technology solutions, will showcase product portfolio for Healthcare, Research & Science, NDT, Homeland Security, Government, and Aerospace at RSNA 2022. Please visit North Hall Booth #7909 to view Parker high voltage cables, connectors, HV cable/control harnesses, interconnect cables, powers cords, line of flat connectors and gaskets, and X-ray tube shields. Parker machining, plastics molding, and additive manufacturing capabilities will also be on display along with high voltage dividers and calibration services. Parker focuses on developing next generation X-ray imaging chain components and subsystems in its new 88,000 sq-ft facility. Parker Engineering available by appointment to discuss high voltage component product design and validation services. Parker serves major equipment manufacturers and aftermarket providers.
Visit: www.parkermed.com

Radcal – South Hall A, Booth 3111

AG 3.0 Simply Powerful X-ray Q/A

Radcal announces its AG 3.0 software which harnesses flexibility and power with unparalleled simplicity.

Simply

Commonly performed procedures are one click away and automated Excel reporting provides streamlined workflow that is game-changing.

Powerful

Exotic measurement modes such as mammography combination modes deliver exciting new imaging capabilities. AG 3.0 can fully characterize these AG3.0 is scheduled for release Q1, 2023.

To explore the powerful simplicity of AG 3.0, visit us at RSNA Booth #3111, visit or contact a sales associate at 626-357-7921. www.radcal.com,

Visit: radcal.com

Radiology Oncology Systems – Booth 6708

ROS (Radiology Oncology Systems) provides refurbished Linear Accelerators, CT Scanners, MRI Systems, PET/CT, and other equipment; as well as equipment removals, purchases, relocations, disposals, installations, storage services, rentals, consultations, valuations, and financing/leasing solutions. Find us at www.ROS.us or email Info@ROS.us.

ScreenPoint Medical – South Hall A, Booth 4141

ScreenPoint Medical is a world leader in the innovation of machine learning solutions to improve breast cancer screening and diagnosis. Developing the market's leading AI solution for reading mammograms and breast tomosynthesis, Transpara is available in over 30 countries.

Visit: www.screenpoint-medical.com

Shimadzu Medical Systems USA – South Hall A, Booth 4703

Shimadzu Medical Systems USA, headquartered in Torrance, California, and a subsidiary of Shimadzu Corporation, is a provider of medical diagnostic equipment including conventional, interventional, and digital X-Ray systems. Shimadzu's imaging portfolio includes Breakthrough Technologies for Radiographic, Mobile, RF and the latest innovations in Interventional X-Ray systems including AI-based image processing.

With a complete line of competitive DR panels and being the only manufacturer with Large Format Tomosynthesis for both RAD and RF equipment. Shimadzu's leadership is lowering lifetime cost, assuring imaging excellence guaranteeing our customers the maximum value on their investment and caring patients and healthcare workers safety. We provide technology solutions to solve everyday imaging problems.

Visit: www.shimadzu-usa.com

Sun Nuclear, a Mirion Medical Company – North Hall B, Booth 6525

Sun Nuclear and CIRS are part of Mirion Medical, a group of healthcare-focused brands within Mirion Technologies. We provide innovative solutions for Diagnostic Imaging and Radiation Therapy centers. More than 5,000 cancer centers worldwide rely on us for independent, integrated Quality Management. With a focus on ongoing support, Sun Nuclear aims to ease technology adoption, enhance workflows and improve outcomes – so that healthcare providers can achieve real results for Patient Safety. Find us in the Mirion Medical booth 6525, North Hall, and learn more at sunnuclear.com.

Visit: www.sunnuclear.com

TDC Trailer – South Hall A, Booth 2501

TDC Trailer, headquartered in Rensselaer, Indiana, is focused on designing, building and refurbishing high-quality, innovative, custom specialty trailers and custom trailers for mobile medical imaging equipment.

With over 40 years of experience, our expertise includes doing business nationally and internationally in the specialty and mobile medical trailer industries and we are very well equipped to provide clients with the best service and final product.

We have the knowledge necessary to deliver the high-quality products and services that truly meet our customer's expectations.

Visit: www.tdctrailer.com

Universal Shielding Corp – South Hall A, #1608

USC has been providing MRI Shielded Enclosures to the medical industry for over 49 years. We design, fabricate, install, and test our enclosures to offer our customers a complete turn-key solution. We are an approved vendor of all of the major MRI manufacturers and manufacture all of our products in the United States. We also stock a wide variety of accessories including air vents, filters, and pipe penetrations. USC is acknowledged as a leader in the field, providing safe, interference-free environments for all MRI equipment. USC is extremely proud of its reputation for safety, on-time delivery, reliability, and industry expertise. Visit: www.universalshielding.com

Volpara Health – South Hall A, Booth 2772

Volpara Health Technologies makes software to save families from cancer. Healthcare providers use Volpara to better understand cancer risk, empower patients in personal care decisions, and guide recommendations about additional imaging, genetic testing, and other interventions. Our AI-powered image analysis enables radiologists to quantify breast tissue with precision and helps technologists produce mammograms with optimal image quality, positioning, compression, and dose. In an industry facing increasing staffing shortages, our software streamlines operations and provides key performance insights that support continuous quality improvement. Volpara is the preferred partner of leading healthcare institutions around the world. Visit: www.volparahealth.com

Ziehm Imaging – South Hall A, Booth 2515

Ziehm Imaging is specialized in the development and manufacture of mobile C-arms. Since 1972, we have produced technologies that enhance imaging and streamline clinical workflows. Our devices' exceptional image quality and flexibility in the operating room serve as an important basis for treatment success.

Our mobile X-ray-based imaging solutions are used in spine surgery, orthopedics, traumatology, vascular surgery, interventional radiology, cardiology, cardiac surgery and further clinical applications.

In close collaboration with universities, research institutions and hospitals, we are developing and enhancing innovative technologies which make our company a pioneer in intelligent interventional imaging.

Visit: www.ziehm.com

RSNA Newsbriefs

Updates from top radiology companies

Agfa HeathCare | Agfa Radiology Solutions – Booth 2553

Join Agfa at RSNA 2022, Booth # 2553, South Hall. Discover our new groundbreaking VALORY DR systems, powered by MUSICA. Learn how Agfa's SmartXR AI tools and the latest MUSICA® functionalities support staff efficiency and the patient experience. With MUSICA, imaging workflows reflect the real needs of technologists, radiologists and healthcare facilities; automatic and intelligent image processing delivers exquisite details and allows lower patient dose. Driven by AI and deep learning, the MUSICA Acquisition Workstation provides operational efficiency and intelligence, with a single, intuitive interface for smooth DR imaging on the entire Agfa DR portfolio. Smart, customer-driven innovations facilitate flexibility and customization to meet the rigorous demands of technologists, radiologists, diverse patient sizes and imaging facilities.

Dunlee – Booth 2911, South Hall A, Level 3

DA200P40+LMB CT Liquid Metal Bearing Tubes Successfully Installed in USA, Europe and LATAM

The DA200P40+LMB with Dunlee CoolGlide™ technology, designed for GE Revolution Evo and OptimaTM CT660 CT scanners, has proven to be a reliable, easy to install CT tube that performs well in a clinical environment, based on several installation in the USA, Europe and LATAM. Liquid metal bearing (LMB) technology results in less wear, and thus a longer life, than traditional ball bearings. The tube also offers easy installation, smooth operation, and a quiet environment.

"Our customers have always trusted Dunlee tubes, and this is no exception," says Guido Stoeckmann, Regional Sales Manager, Europe. "The customer feedback is very positive."

Future plans include validation for additional GE CT scanners types with LMB tubes, and finalizing registration for China.

EDAN – North Hall B, Booth 6350

EDAN To Attend RSNA 2022 with Its Ultrasound Imaging Solutions

CHICAGO, Oct. 28, 2022 /PRNewswire/ -- EDAN Instruments, Inc. (300206.SZ) announces to reunite with its partners with the latest ultrasound solutions and insights at RSNA 2022. The world's largest radiology conference reverted to the form of an on-site event after a hiatus of three years. Multiple newly upgraded flagship solutions from EDAN, both cart-based and portable, will be presented to the Americas market at Booth 6350 in McCormick Place from November 27 to December 1.

As the flagship ultrasound system from EDAN, Acclarix LX9 in an upgraded version, will be the highlight of the booth. And this is also the first appearance in RSNA of the new version LX9 and its technological upgraded transducers. It is equipped with optimized algorithms, a more aesthetically pleasing UI design, and enhanced workflow. Advanced features like eLive are also introduced in Acclarix LX9, allowing for detailed visualization of subtle anatomical features, thereby enabling intuitive diagnosis with real-time 3D images and enriching patient communication.

Besides, the portable ultrasound system, Acclarix AX3 and the compact cart-based ultrasound solution, Acclarix LX3, both come with new features and functions, aiming to give the audience an amazing demo experience.

"It is indeed heartening to catch up with our clients and partners in person, and exchange cutting-edge technologies and concepts for the ultrasound field, " said Ray Lun, the head of the Americas market at EDAN. "We will continue to optimize our solutions for fueling the future of imaging."

ETS-Lindgren – Booth 3147

With over 50,000 RF Shielded installations globally, ETS-Lindgren continues its reputation as an industry leader with innovative products and services for MRI Shielding. "We especially appreciate supporting RSNA because the attendees are as passionate about MRI facility design as we are at ETS-Lindgren," said Joel Kellogg, ETS-Lindgren's Director of Business Development for Healthcare, Industry, and Government. "ETS-Lindgren is committed to partnering with RSNA's medical imaging professionals as we value collaborating with industry leaders. We share the same goal of designing products and services that ensure optimal operation of imaging equipment as well as the highest level of staff and patient comfort."

Visitors to ETS-Lindgren's booth will see examples of the innovative EVO™ Series of MRI RF Shielded Doors and ClearShield™ RF Shielded Windows, including the new convertible S-Glass™, which offers transparent- to-opaque privacy views with a simple flip of a switch. We invite you to speak

with our specialists during RSNA to hear about the customized programs we offer for service and maintenance programs to protect your RF Shielding investment and minimize downtime in your MRI suite. Our engineering services include site planning and site surveys for acoustic and vibration analyses as well. Rest assured that ETS-Lindgren will provide continued support through its six manufacturing factories and team of more than 700 employees worldwide. With its wide variety of industry-leading MRI shielding products and services, as well as decades of experience, ETS-Lindgren is the natural choice of medical imaging professionals. In short, ETS-Lindgren is Committed to Enhancing Patient Experiences and Outcomes.

JVC Healthcare – Booth 1548

JVC, headquartered in Yokohama, Japan, has sales offices and services facilities in North America, EMEA and Asia. A highly recognized and trusted brand, JVC continues to expand its footprint to the Radiology, Pathology, OR market and the entire healthcare market.

JVC medical display product lines are loaded with useful features, new-patented technology and invention for a superb experience for the radiologists.

JVC new color 12mp, newly designed color 6mp are already available to the market. We also introduce now 8Mega color display and 27" color display.

Medinformatix – Booths 6300 and 6500

MedInformatix Mobile Apps Connect Patients & Providers

Radiology's most powerful RIS is back at RSNA 2022 featuring an enhanced suite of mobile apps that promise new levels of connection and convenience to radiology patients and providers. The apps are IOS and Android compatible and integrate seamlessly with the MedInformatix RIS.

MI Contact helps practices generate new leads from referring physicians. Marketers can create contact profiles and history, chart outreach and monitor budgets.

MI Mobile allows patients and providers to conduct and manage many aspects of their healthcare, such as appointment scheduling, prep instructions, registration and check-in, insurance and payment related tasks from their mobile device.

MI Notify lets practices send voice, text and email messages to patients on matters pertaining to appointments, procedures, billing and other matters.

"Our responsibility is to utilize technology to create a better healthcare experience for everyone involved," said Pat McGonigle, CEO of MedInformatix. "We've conducted rigorous testing of these apps with both patients and providers, and the response tells us we've accomplished what we set out to do."

Medimaps Group – South Hall A, Booth 3955

Medimaps: Providing The Full "Bone-Health" Picture

Osteoporotic fractures occur every 3 seconds; current diagnostics only tell half the picture – missing 50% of patients at risk. Bone mineral density (BMD) measures bone quantity but not bone structural quality. Today's current technology for diagnosing osteoporosis only measures BMD, which satisfies only half of the World Health Organization's definition of osteoporosis. The full definition includes BMD and Trabecular Bone Score (TBS).

TBS plus BMD can tell the full "Bone-Health" picture. A simple $40 reimbursable test can save billions in fracture/osteoporosis care.

MEDIMAPS GROUP, specializing in imaging software for assessing bone health, will demonstrate its TBS software (Booth #3955, AI Showcase – South Hall Level 3). They also can discuss how TBS:

- Can integrate seamlessly into existing workflows;
- Is proven and cleared in 60+ countries and clinically validated in 900+ publications;
- Reimbursable in the U.S. and some European countries; and
- Can help radiologists have an even larger role in osteoporosis diagnosis.

Innovation Showcase Presentation (28-November, 11:30-11:45am): "Rethinking How to Diagnose Osteoporosis. Do You Have the Full Picture?"

Join us to examine the findings of a recent survey of radiologists' perceptions of osteoporosis in which 95% of radiologists surveyed underestimated the percentage of non-osteoporotic patients who fracture, and 75% underestimated that number by more than half. This presentation will discuss how TBS—the key missing variable—when taken into account, can help to reduce the likelihood of missing patients at fracture risk.

Book a TBS Demo at Medimaps' booth at https://bit.ly/3PFpNug

OneMedNet – South Hall A, Booth 4929

OneMedNet Tops 200 Provider Partners in Imaging RWD Network

Minneapolis, MN (November 1, 2022) — OneMedNet Corporation, the leading curator of regulatory-grade Imaging Real Word Data through its proven OneMedNet iRWD™, today announced that more than 200 healthcare providers have joined the iRWD partner network.

"Healthcare providers are experiencing an appreciable benefit of participating in our iRWD ecosystem", said Joe Walsh, OneMedNet Chief Commercial Officer. "For many of our provider partners, this is a great way to achieve local patient participation in clinical trials and studies with near zero resource investment on their part. Furthermore, they can generate recurring licensing income on an often-idle asset."

Life Science utilization and reliance on iRWD is also expanding within the OneMedNet ecosystem. From research and development to regulatory approval and post-market surveillance – industry innovators are realizing significant advantages as well. Those include time to market reductions, cost efficiency gains, and solution effectiveness improvements.

With more network providers comes even greater data diversity which benefits the entire ecosystem, and most importantly, the patients.

About OneMedNet Corporation
Founded in 2009, OneMedNet provides innovative solutions that unlock the significant value contained within the clinical image archives of healthcare providers. Employing its proven OneMedNet iRWD™ solution, OneMedNet securely de-identifies, searches, and curates a data archive locally, bringing a wealth of internal and third-party research opportunities to providers. By leveraging this extensive provider network, together with industry leading technology and in-house clinical expertise, OneMedNet successfully meets the most rigorous RWD Life Science requirements. For more information, visit www.onemednet.com.

Radcal – South Hall A, Booth 3111

Radcal wins deal to supply quality assurance X-ray testing equipment to West Physics.

Radcal Corporation, a leading manufacturer of Diagnostic X-ray QA meters, is proud to announce that it has reached an agreement with West Physics to supply quality assurance X-ray testing equipment.

Dr. Geoffrey West, President and Chief Medical Physicist of West Physics, commented, "Radcal's Accu-Gold+ Touch Pro will be an important addition to West Physics' scientific equipment inventory as we continue to expand. These new x-ray testing kits provide accuracy, reliability, and superior operating economics".

Radcal
For over 40 years Radcal has been a steadfast partner in making accurate reliable radiation measurements. For more information, please visit www.radcal.com and visit our booth at #3111.

Shimadzu Medical Systems USA – South Hall A, Booth 4703

Shimadzu Medical Systems USA exhibits at RSNA 2022

Torrance, CA – November 1, 2022 – Shimadzu Medical Systems USA, a subsidiary of Shimadzu Corporation will showcase our complete product portfolio of X-ray systems and digital solutions at the upcoming 2022 RSNA (Radiological Society of North America).

Products and technologies featured in our booth:

- Trinias Opera – featuring Score Opera AI based deep learning image processing
- SONIALVISION G4 LX edition - multi-application digital R/F system
- FLUOROspeed X1 edition – patient side R/F system
- RADspeed Pro – premium DR with new PowerGlide feature
- MobileDaRt MX8 – advanced DR mobile with GlideView supreme operability
- Advanced healthcare – learn about our newest approaches in advanced healthcare

About Shimadzu
Shimadzu Corporation, founded in 1875 in Kyoto, Japan, and the parent of Shimadzu Medical Systems USA (SMS), is a global provider of medical diagnostic equipment including conventional, interventional, and digital X-ray systems. Shimadzu Medical Systems USA is headquartered in Torrance, California, with sales and service offices located throughout the United States, the Caribbean and Canada. Its sales and marketing office is in Beachwood, OH, and its direct operations has headquarters in Dallas, TX and Kenmore, WA. Visit Shimadzu Medical Systems at www.shimadzu-usa.com or call (800) 228-1429.

We look forward to seeing you in Booth #4703 in the South Hall.

West Physics

West Physics, headquartered in Atlanta, Georgia, is a leading global provider of integrated diagnostic medical and health physics testing and radiation safety consulting services. For more information, please visit www.westphysics.com.

RSNA
PRODUCT SHOWCASE

The following are just some of the products and services that will be on display at RSNA.To view these products online, or to share with colleagues, visit dotmed.com and enter the code DM 59175 in the search window, or enter the address www.dotmed.com/news/59175 in your browser.

Agfa VALORY
Agfa HeathCare | Agfa Radiology Solutions - Booth 2553

VALORY is Agfa's newest MUSICA® Powered addition; it is available with a wide choice of a generator power, floor or ceiling-suspended tube and CSI detectors. Agfa detectors deliver robust reliability, cost-effectiveness, potential patient dose reduction, outstanding battery life and the ability to share detectors. VALORY provides productivity and confidence with proven reliability backed by a robust equipment warranty. The intuitive user interface makes training easy; smooth workflow gets patients completed quickly and comfortably with auto-tracking and auto-centering. VALORY is ideal for a wide range of facilities and patients supporting patient weigh up to 320 kg/705 pounds.

Agfa DR 100s Mobile DR
Agfa HeathCare | Agfa Radiology Solutions - Booth 2553

Designed by Radiologic Technologists, powered by MUSICA® image processing, the Agfa DR 100s makes your mobile imaging highly efficient with an extended range of imaging applications including SmartXR AI assisted options. Capture consistent, high quality, low dose exams bedside on a full range of patients from neonatal to bariatric. DR 100s features a MUSICA Acquisition Workstation with a large, tilting 22" touch-screen display and optional on-tube display. Integrated connectivity and interoperability with your EHR and PACS are supported by state of the art network security and flexible workflow to match the needs of your patients and your facility.

FerrAlert® ENCOMPASS LE
Kopp Development - South Hall A, Booth 1735

Kopp Development Inc., the leading manufacturer of Ferromagnetic Detection Systems for MRI Safety, provides the most extensive product offerings to work safely with the powerful magnetic field of the MR modality. At RSNA we will be introducing new and highly comprehensive MRI Safety Solution, FerrAlert® ENCOMPASS LE which automatically logs:

- Ferromagnetic entries
- Door openings
- Sensor alarm positions
- Pause function

FerrAlert® ENCOMPASS LE provides complete and verifiable data for TJC inspections, ACR compliance, and Root Cause Analyses investigations.

All FerrAlert® detectors incorporate unique, patented technology to detect and precisely locate offending ferrous objects. This exclusive feature makes them the preferred choice by hospitals and imaging centers worldwide.

RSNA
PRODUCT SHOWCASE

Radiology Online Learning Platform
DetectedX - North Hall B, Booth 7951

DetectedX's Radiology Online Learning Platform has been proven to help clinicians improve the ability to detect and diagnose breast cancer cases, showing a 34% improvement in the accuracy of diagnosing difficult cases. Providing immediate feedback on discrepancies between truth and actual decisions, the AI-based tool can identify individual weaknesses and prescribe tailored educational programs. The on-demand, web-based training platform is currently in use by more than 3,000 users in more than 150 countries, including national screening services and professional societies in Australia, Ireland, New Zealand, Slovenia, Italy and Vietnam. For more information or to schedule an appointment, visit detectedx.com/rsna

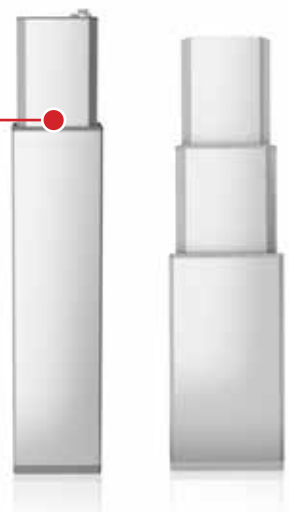
Expanded Rover Family
MICRO-X - North Hall B, Booth 7161

Our Rover Mobile DR system is ultra-portable with exceptional image quality, powered by our Nano Electronic X-ray Technology using a miniature x-ray tube.

Only about 220 lbs, the Rover doesn't need a motor, so brings reliability, is light weight and super quiet. The design enables easy swivel movements with one hand, precise positioning with the no-drift head and counterpoise arm. The Rover is economical to handle and with reduced complexity is cost saving.

The ROVER is our classic model. The ROVER PLUS is for those exams when you need a little bit more power.

LC Lifting Columns
LINAK U.S. Inc. - South Hall A, Booth 2707



The LC lifting column family from LINAK is instrumental in high-end medical applications like imaging equipment. Available in standard and heavy duty, in both two and three-stage versions, the LC3 is our strongest lifting column and can lift 1,350 lbs. from the floor and 900 lbs. from the ceiling. Our new LC1 is ideal for lighter-duty applications. Whether your imaging application includes a C-arm or an adjustable table with ceiling mounted equipment, the essentials of accurate positioning, flexibility and speed are ensured by the LC lifting column family from LINAK.

ClearShield™ S-Glass
ETS-Lindgren – Booth 3147

With over 50,000 RF Shielded installations globally, ETS-Lindgren continues its reputation as an industry leader with innovative products and services for MRI Shielding. At RSNA, ETS-Lindgren introduces a new offering of ClearShield™ RF Shielded Window, aptly named ClearShield™ S-Glass (switchable-glass). Using liquid crystal technology embedded in the window's glass, S-Glass enables transparent-to-opaque privacy views; with a simple flip of a switch, providing privacy when you need it and a clear view when you don't. The S-Glass technology may be incorporated directly to the glass eliminating the need for infection-prone window coverings in order to provide privacy. With an STC 40 rating, S-Glass also enhances patient and staff comfort with a quieter environment.

MRI In-Bore Viewing Solutions
PDC Facilities, Inc.

The latest in MRI in-bore viewing solutions to best meet your needs. Three new proven solutions include quick, easy installation, no construction, free trials and a zero-contact option.

Scrolling text, countdown timers, patient camera and picture-in-picture are just a few of the new features.

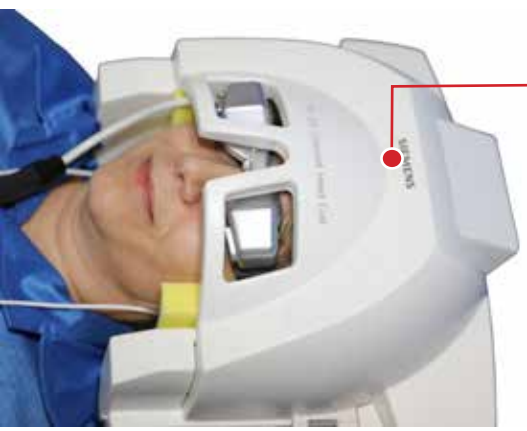
Invest in a patient experience that will create improved patient satisfaction, reduced anesthesia and an ROI in less than six months. Visit pdcbiz.com for more information and to explore our latest in-bore viewing solutions!

X-Ray Protective Clothing & Accessories
MAVIG - South Hall A, Booth 3129

MAVIG, the international market leader for radiation protection, offers you a renewed PPE-Collection with many innovations, new products and features, such as:

- Complete Line-Up of Inner Protective Material – Lead, Novalite Composite and Leadfree
- New Colors for the outer Materials ComforTex HPMF and ComforTex HPMF Hybrid
- Flexible Embroidery on our X-Ray Protective Aprons
- New Shoulder Weight Relief BRYGGA®
- New Shoulder-Protector RA637 Bolero

and many more...



CinemaVision CV2020 Audio Video MR Entertainment System
Resonance Technology - North Hall B, Booth 6515

Resonance Technology, Inc introduces the CV2020 next generation of Audio/Video patient comfort for the MRI. Live Demonstrations located at RSNA 2022 Booth # 6515. The CV2020 is compatible to MRI suite strengths from 1.5T to 7T environments delivering Hi-Fidelity soothing Audio along with High Resolution vibrant video to the patient for clinical scanning procedures. For fMRI, the Controller can be integrated with multiple Audio/Video Inputs to have the desired paradigm outputs required for a vast spectrum of applications. While continuing the ability to have vital two-way communication between the Radiologist and the patient inside the MRI suite. Avoid the use of costly sedation and recommend this entertaining alternative. Quick patient set up can increase patient throughput. Additionally, available for demonstration are the MR-Compatible MagnetVision Monitor and Evoke Patient Response device for the fMRI researcher paradigms.

Trinias Opera
Shimadzu Medical Systems USA
South Hall A, Booth 4703

The new Trinias angiography system uses AI deep learning technology to improve the visibility of medical devices while using 40% or more lower X-ray dose of previous models. This represents the first time AI has been incorporate into the image processing engine of an angiography system.

The new Trinias system also offers an extensive new feature set to simplify workflow, allowing a more efficient clinical operation in any medical setting. With the launch of a subscription service that ensures software can always be updated to the current version, the new Trinias system offers a sustainable product designed for long-term use.

RSNA
PRODUCT SHOWCASE

TechGate Auto
Aegys

TechGate Auto from Aegys is an advanced warning system for controlling access to the MRI room. Warning messaging is effectively communicated through the utilization of bright, dynamic, color changing LED barrier arms which extend across the opening to the MRI room. These barrier arms are rotated into position automatically by activation from MRI conditional remote transmitters or by the transit of anyone into or out of the room. Unlike plastic chains or retractable belts that require manual latching each and every time, the TechGate Auto self deploys ensuring effective hazard warning and access control at all times. "Caution Barriers" are now recommended by the American College of Radiology to protect the MRI room entrance when the door to the MRI room is open.

DA200P40+LMB Replacement CT tube with Liquid Metal Bearing
Dunlee – South Hall, Level 3, Booth 2911

The Dunlee DA200P40+LMB tube with CoolGlide™ liquid metal bearing (LMB) technology offers easy installation, smooth operation, and a quiet environment. CoolGlide technology results in less wear, and thus a longer life, than traditional ball bearings. Specifically designed for GE Revolution™ Evo and Optima™ CT660 CT scanners, the DA200P40+LMB tube is a cost-effective alternative to OEM replacement tubes. Each tube is built according to the highest quality and regulatory standards, and extensive testing confirms the compatibility for GE CT target scanner.

Future plans include validation for additional GE CT scanners types with LMB tubes, and finalizing registration for China.

CT4000 CT Tube
Dunlee – South Hall, Level 3, Booth 2911

Dunlee's CT4000 is a workhorse CT tube perfectly suited for the high duty environments. It features CoolGlide™ liquid metal bearing (LMB) technology, which delivers excellent heat dissipation for continuous scanning, supporting high throughput. The frictionless operation of LMB tubes decreases wear on the tube, resulting in a longer life than traditional ball bearing tubes. The CT4000 is also available as part of a product bundle designed to speed time to market. The bundle includes a generator, X-ray tube and cooling unit and optional X-ray detector that have been developed and tested together, as well as color-coded cables, tools and manuals.

MedBays
Harmony Medical Solutions

Harmony Medical Solutions introduces MedBays, a prefabricated, Modular Medical Enclosure constructed from a shipping container framework. These modular enclosures are turnkey medical facilities customized to support a host of medical modalities. By design, these MedBays enclosures are semi portable and self-sufficient to handle any level of infrastructure or power conditions in their area of deployment. Harmony's goal is to create a durable structure that is ideally designed as a self-contained, affordable healthcare facility to developing countries, disaster relief shelters, and local hospitals looking to expand their existing facilities with a singular or multiple building block solution.

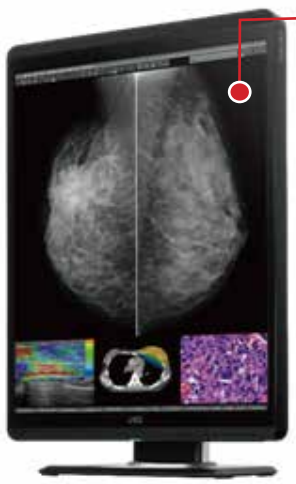
CEIA PD240CH-Z4
Aegys and CEIA USA Ferromagnetic Division

The CEIA PD240CH-Z4 is the only handheld MRI patient screening solution that can operate on an all metal mode of detection and with a push of a button switch to a ferrous only mode of detection. This dual capability addresses the projectile threat of ferrous items while also addressing the RF induced burn risk or artifact generation caused by any metal item. Additionally, the Z4 is the also the only MRI handheld MRI patient screening solution validated as MRI-Conditional to 3T. MRI Safety just got safer!

Reveal™ Mobile System
KA Imaging - North Hall B, Booth 7948

KA Imaging is introducing the Reveal™ Mobile System. Powered by patented SpectralDR™ technology, the System operates with the Reveal™ 35C detector, which is also sold as a retrofit solution. KA Imaging's SpectralDR™ technology enables dual-energy subtraction, providing bone and tissue differentiation with a single standard X-ray exposure. The technology uses identical clinical techniques associated with state-of-the-art mobile DR X-ray, and reduces patient dose due to the industry leading DQE of the Reveal 35C detector.

The Reveal 35C is FDA cleared. The Reveal Mobile System is not available for sale. The company will be at RSNA at booth 7948 in the North Hall.



Innovative 5MP Color & Monochrome Diagnostic Displays
JVC Healthcare – Booth 1548

Innovative 5MP Color & Monochrome Diagnostic Displays

For decades, JVC's unmatched technologies and expertise have opened doors to the groundbreaking advancements in numerous industrial markets. And now we are in the medical imaging providing the same.

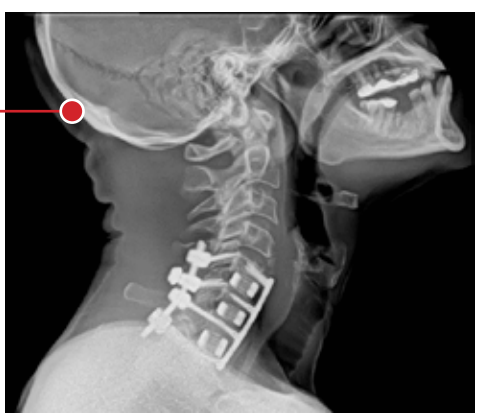
JVC presents its i3 series CL-S500 and MS-S500 color and mono displays to the digital and mammography and tomo market. The 5mp color and monochrome displays offer new and exciting features including a sleek and stylish design with two-tone color, self-calibration, a glass protective panel and more consistent image quality. The new color management technology of the "i3 series" features its unique X,Y,Z tracking and sophisticated color matching.

Our 12mp monitor with the i3 technology which can handle any type of image including digital mammography and general X-rays.

Combined with the new calibration software QA Medivisor Agent, the JVC solutions make it easier to manage the day-to-day operations in the radiology department.

RADspeed Pro
Shimadzu Medical Systems USA - South Hall A, Booth 4703

Shimadzu Corporation and Konica Minolta, Inc. collaborated on the development of Dynamic Digital Radiology (DDR) incorporating Konica Minolta's new advanced image processing and Shimadzu's RADspeed Pro radiographic imaging system. DDR is an enhanced X-ray technology that provides a series of individual digital images acquired at high speed and low dose. The resulting cine loop enables clinicians to observe the dynamic motion of anatomical structures over time, enhancing diagnostic capabilities. The motion series can be analyzed and quantified with the DDR advanced image processing capability.



MR Year in Review

The year in MR news saw continued expansion in many directions. New heavy-duty scanners with cutting edge capabilities, as well as smaller and more portable systems to bring MR into areas it has never gone before. Here, in chronological order, are the ten biggest MR stories of the year from our Daily News online.

Hong Kong scientists develop compact ultralow-field MR brain scanner

Scientists at the University of Hong Kong announced in January they had built a prototype compact ultralow-field MR scanner designed to assess brain injuries and disorders.

The prototype is equipped with a compact two-pole 0.055T permanent samarium-cobalt (SmCo) magnet and can be plugged into a standard AC power outlet. Its dimensions are 95.2 x 70.6 x 49.7 cm, and the bore is 29 x 70 cm. Its footprint is approximately two square meters, and it is meant to be a permanent magnet-based, low-cost, low-noise, low-power and shielding-free ULF brain MR scanner, according to Physics World.

The motivation behind the design was the fact that approximately 70% of the world's population has little or no access to high-field superconducting MRs, which are expensive not just in cost but in installation and maintenance. The team estimates that their machine can be built in quantity with material costs under $20,000.

Additionally, roughly 30% of clinical MR cases involve the brain. This also pushed the researchers to build a ULF brain MR, because there is a great need for such imaging in the diagnosis and prognosis of various neurological diseases and injuries. "The goal is to develop methodologies for such ULF scanners to perform many routine yet clinically useful neuroimaging protocols, so as to fulfill the unmet clinical needs in point-of-care situations and/or developing countries," senior author Ed X. Wu, Lam Woo Professor in the laboratory of biomedical imaging and signal processing at Hong Kong University, told HCB News.

The findings were published in *Nature Communications*.

MR starting in early 30s could cut breast cancer mortality by 50%

Getting an MR scan between the ages of 30 and 35 could spare women with a genetic predisposition for breast cancer from a more than 50% chance of death from the disease.

A team of researchers spread across the U.S. found in February that pathogenic variants in three genes — ATM, CHEK2 and PALB2 genes — are as prevalent as the more commonly known BRCA1 and BRCA2 gene mutations, and like them. Depending on the variant, women face a lifetime risk of developing breast cancer at 21% to 40%.

But screening these women has been challenging due to a lack of clinical trials to inform guidelines on when diagnostic exams should begin and how to screen. "The study supports the importance of testing appropriate women at a relatively young age so that they can benefit from MR screening. In general, we suggest testing women who meet NCCN criteria at around age 25-30," Dr. Mark Robson, senior author of the paper and chief of the breast medicine service at Memorial Sloan Kettering Cancer Center, told HCB News.

Robson and his colleagues evaluated risks and MR efficiency

using established breast cancer simulation models. They input age-specific risk estimates provided by the Cancer Risk Estimates Related to Susceptibility (CARRIERS) consortium from more than 32,000 patients and a similar number who had no cancer. They also included recent published data for screening performance.

The findings were published in *JAMA Oncology.*

Portable MR almost on par with stationary systems for stroke detection

Findings published in April show that portable MR systems are nearly as efficient for diagnosing stroke as stationary MR systems.

They are also effective at differentiating ischemic strokes from ones caused by blood clots, according to Yale and Harvard researchers who used portable MR to successfully identify such cases in 90% of patients scanned.

Determining the type of stroke a patient has is crucial for choosing the right treatment, as blood thinners are essential for those with ischemic strokes but dangerous for patients with ones where the bleeding is in the brain. Portable MR can bring care right to the patient's bedside, in ambulances or in remote clinics. It also decreases waiting for scans with stationary MR, which are in high demand and often in use.

As a result, the scientists say that it may ensure faster decision-making and delivery for treatment in remote areas where patients lack access to major hospitals with standard MR systems. "This is the first systematic evidence you can detect ischemic strokes using portable, bedside devices," said Kevin Sheth, a professor of neurology and neurosurgery at Yale School of Medicine and co-corresponding author of the study.

Sheth and his peers used portable MR scanners on 50 patients at Yale New Haven Hospital and found they largely confirmed cases of ischemic stroke that were diagnosed by stationary MRs. For 45 of these patients, it detected blood clots as small as four millimeters in size.

The team used Swoop, a portable MR scanner developed by Yale New Haven and Hyperfine. The solution is equipped with a 0.064 magnet and is 20 times cheaper, 10 times lighter and consumes 35 times less power than fixed conventional MR solutions, according to Hyperfine.

FDA greenlights Philips' 7700 3T MR system

In May, Philips received FDA clearance for its 7700 3T MR system, designed with powerful XP gradients for improved high-quality diffusion imaging.

The solution is equipped with six multi-nuclei capabilities that increase diagnostic confidence for conducting and interpreting neurological scans and add important metabolic information to exams. The system made its debut at the International Society for Magnetic Resonance in Medicine (ISMRM) annual meeting, taking place May 7 to May 12 in London. It will also be spotlighted at the European Congress of Radiology (ECR) annual congress in Vienna in July.

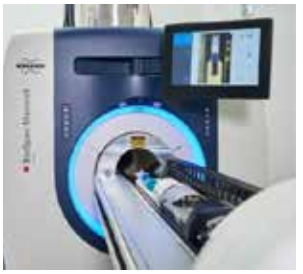
The system has a 65-20 gradient chain. Its XP gradient coils are able to achieve up to 35% higher signal-to-noise ratios and reduce scanning time by up to 35%. This enables radiologists to complete 20% more fMR volumes and 50% more diffusion tensor imaging directions to produce detailed high-resolution images that they can use to confidently identify and characterize lesions.

Another valuable component is in-built AI applications such as touchless patient sensing and motion detection for addressing upswings in patient volumes that many radiology departments currently experience. "The low effort required for modifying scan parameters and protocols supports fast and easy experimentation with imaging techniques. These latest features clearly help improve our patient and staff experience and distinguish Philips as one of the main reasons we choose this system," said Walter Heindel, professor of radiology and chairman of the department of radiology at the University Hospital

Münster in Germany, in a statement.

The MR 7700 can perform conventional proton MR and spectroscopy and has in-built protocols to combine proton scanning with other forms of imaging based on sodium, phosphorus, carbon, fluorine and xenon.

Bruker debuts 7 Tesla and 9.4 Tesla MR and PET/MR magnets



Bruker unveiled its 7 Tesla and 9.4 Tesla conduction-cooled Maxwell magnets in May for high-field sensitivity and resolution in advanced preclinical MR and PET/MR research scanners.

Designed for its BioSpec Maxwell preclinical MR system, the magnets are follow-ups to the BioSpec Maxwell 3 Tesla model and do not require liquid helium or nitrogen refills. Bruker expects them to be valuable for producing sharp images from noninvasive in vivo imaging on small rodents in preclinical research. It says the scans will have high spatial and temporal resolution and help in assessing miniscule areas in high-resolution anatomical imaging of the mouse brains or when performing function MR.

Making their debut at the International Society for Magnetic Resonance in Medicine (ISMRM) 2022 conference, the two MR components utilize high-performance technology in easy-to-use systems to provide researchers with a range of preclinical applications. Siting, installation and maintenance is also simplified, as there is typically no building modification needed.

"The pharmaceutical industry is experiencing pressure to bring new drugs to market faster and more cost-effectively. Contract research organizations are striving for best-in-class solutions in a small footprint. Our new Biospec Maxwell MRI series does not require specialized lab infrastructure and offers compact, lightweight and easy-to-install systems for preclinical MR or PET/MR studies," said Dr. Wulf Jung, president of Bruker BioSpin's preclinical imaging division, in a statement.

The BioSpec Maxwell preclinical MR system is a liquid cryogen filling-free MR system that is upgradable with an MR CryoProbe, which increases sensitivity, and with a state-of-the-art PET module.

Bruker's preclinical imaging systems are for research use only

7T MR yields new benefits for understanding, treating Parkinson's

7T MR may help determine which patients with previously untreatable symptoms of Parkinson's and similar conditions would benefit from new treatments, according to findings published in May.

Researchers at the University of Cambridge's Wolfson Brain Imaging Centre used the scanner to identify Parkinson's and progressive supranuclear palsy (PSP) patients who endured damage to their locus coeruleus, a tiny part of the brain that produces noradrenaline, which helps with brain functioning such as attention, arousal, thinking and motivation.

In a study last year, they found certain PSP patients had lost as much as 90% of their locus coeruleus and surmised that noradrenaline boosters could help alleviate symptoms in these specific patients.

Many companies produce these drugs, which have been approved for similar uses. Unfortunately, 3T and lower magnetic field MR systems are unable to show the locus coeruleus of living patients on scans, making it impossible to identify patients with damage there.

Co-lead author professor James Rowe, from the university's department of clinical neurosciences, told HCB News that 7T may solve the problem because of its higher resolution. "The locus coeruleus is also the first part of the brain to be damaged by Alzheimer's disease, as well as being among the most sensitive regions to Parkinson's and PSP. So the ability to detect individual impact of the disease as a guide to treatment is of importance to many people. The locus coeruleus is also an important factor in ageing — and how to stay cognitively well as one gets older."

Siemens smallest, lowest-cost MR scanner gets FDA OK

The FDA gave clearance to the MAGNETOM Free.Star whole-body MR scanner from Siemens Healthineers in July.

The second system designed for the High-V MR platform, MAGNETOM Free.Star is the smallest, most lightweight scanner made by Siemens, as well as its most affordable MR scanner. It has a 0.55 Tesla field strength that, combined with deep learning technologies and advanced image processing, produces high-quality images.

The machine weighs 3.3 tons and is less than 80 inches high. It also requires less than one liter of liquid helium and has no quench pipe, reducing infrastructure and life cycle costs. "The MAGNETOM Free.Star is further proof of our steadfast commitment to providing customers with MR scanners that are more cost-effective, more easily operable, and more easily sited for installation at a wide variety of healthcare institutions across the United States."

The reduced energy consumption in MAGNETOM Free.Star brings down total life cycle costs by more than 30% over conventional scanners, and its Deep Resolve algorithms perform targeted denoising and produce high-resolution images at a level only previously possible at higher field strengths.

The FDA clearance follows that of MAGNETOM Free.Max, a compact whole-body scanner weighing less than 3.5 tons, in July 2021. Like MAGNETOM Free.Star, it has a 0.55 Tesla field strength, uses less than one liter of helium and has no quench pipe.

Both also use Deep Resolve algorithms, as well as the myExam Companion workflow solution, which leverages AI to guide users of

all experience levels through exams, regardless of patient or throughput. Because of their smaller infrastructures, both scanners can be installed in areas not previously accessible for MR, with minimal structural modifications required.

Masks and MR safety: researchers examine the risks

Wearing the wrong face mask in or around an MR scanner can pose serious risks, including mask displacement and face burns, as well as artifacts that make images unusable and result in repeat scans. Despite this, there is no official guidance on what masks are safe to use.

In a July study, researchers at Cardiff University found these outcomes were possible when wearing certain types of masks due to the ferromagnetic materials within them. Testing eight different types, they found that five contained magnetic components that they say are MR unsafe.

To prevent these adverse events, they recommend a color-coded system. "We suggest that where possible, surgical masks should be ordered in a separate color to distinguish between an 'MR safe' and an 'MR unsafe' surgical mask," said lead study author Dr. Bethany Keenan, from Cardiff University's school of engineering, in a statement.

The scientists performed three MR scans on a 3D printed model of a head and neck fitted with eight commercially available FFP3 masks. Safety was based on the presence of ferromagnetic and metallic materials, as well as a measurable deflection at the MR bore, and a temperature greater than 40°C during testing.

Two of the masks were deemed MR safe. One was labeled MR conditional because there was a potential risk of local heating under certain conditions within the MR machine. "It is extremely important to not assume that a mask is safe prior to an MR examination, and to conduct a safety evaluation to determine which components are made of ferromagnetic metals and which are non-ferromagnetic metal," said Keenan.

NYU Langone, Fermilab to enhance, speed up quantitative MR with quantum computing

NYU Langone and Fermilab's Superconducting Quantum Materials and Systems Center proposed a pilot program in July to study a new method in MR imaging that combines quantitative MR (qMR) with quantum computing.

The two would develop algorithms that quantum computers could use to accurately and rapidly determine multiple tissue properties from MR scans. While quantum computing would speed up and make scans more accurate, the algorithms would improve qMR for clinical use to allow doctors to confirm interpretations by comparing MR scans based on statistics and machine learning, rather than inconsistencies in image contrast.

"We expect to be able to model a large number of properties and the interactions among them to obtain a more comprehensive picture of the underlying structure of the imaged tissues. This will be possible not just because quantum computers enable faster generation of the large models, but also because they are better suited than traditional computers to model the interactions between tissue properties in MR, since they are governed by the laws of quantum mechanics," Dr. Riccardo Lattanzi, an associate radiology professor at NYU Grossman School of Medicine and principal investigator, told HCB News.

Scientists determine biophysical properties in human tissues using magnetic resonance fingerprinting to analyze MR signal responses. These properties create contrast between tissues that appear on MR scans.

The data is held within the 3D pixels of MR scans, which quantum computers can use to measure properties to assess and monitor patient health across multiple scans. It also can speed up measurements and create more accurate MR simulations to show the underlying properties of the MR data fingerprints.

Hospital not liable for neglect of patient burned during MR scan

In October, the California Court of Appeals reaffirmed a lower court ruling that a hospital was not guilty of neglect after a patient was burned during an MR procedure there.

The man, who died from unrelated circumstances, underwent an electrocardiogram and MR imaging in 2016 at Glendale Adventist Medical Center after waking up "weaker than usual," according to the news outlet, Human Resources Director.

The man was wearing ECG pads during the scan and came out with a burn on his abdomen. The MR technologist was not trained on the dangers of ECG pads in MR machines but did check him for metal and his medical history before the exam.

The patient filed a civil complaint in 2018, alleging that the hospital failed to screen him properly. Following his death, his estate took over the suit. The case is named Kruthanooch v. Glendale Adventist Medical Center.

During the trial, a diagnostic radiology specialist representing the estate said the hospital did not abide by industry or radiology care standards during screening, and that employees lacked proper training.

A reconstructive plastic surgery specialist who spoke on behalf of the hospital said performing an MR scan with ECG pads was within the standard of care and consistent with exams in outpatient surgery centers and hospitals. They said the pads did not cause the burns; that the actual cause was unknowable; and that the plaintiff had a history of ill health, including coronary artery disease and diabetes.

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Will AI ultimately replace or assist radiologists?

By John R. Fischer

Most AI models are designed to detect one or two abnormalities in scans, rather than multiple. (Photo courtesy of Mayo Clinic)

From scheduling patients to interpreting images, artificial intelligence is poised to fundamentally change radiology, offering new potential applications and insights that will enhance scanning accuracy, workflow and patient outcomes.

But it's still early, practices have been slow to adopt the technology and there are more questions than answers. From concerns over accuracy and biased algorithms, to skepticism over the specific value AI can provide on a day-to-day basis. From a wide-angle perspective, some healthcare practitioners, including medical students, worry the technology could someday render radiologists obsolete.

For **Dr. Michael Atalay**, professor in the department of diagnostic imaging and vice chair of imaging research in the Alpert Medical School at Brown University, addressing concerns about AI replacing radiologists is an important part of the job. He stresses, to students and colleagues alike, that AI will "assist" radiologists.

"We have to show how we're embracing the new technology and the firm belief that it will enhance our roles as diagnosticians and improve patient safety and outcomes," Atalay, who also serves as director of cardiac MR and CT at the Alpert Medical School, told HCB News. "Along the way it will also likely improve job satisfaction and quality of life and decrease the high physician burnout rates that we're seeing now."

Figuring out where and how AI fits into an individual radiology practice's workflow, Atalay and others say, will be a critical step toward gaining physician trust and accelerating adoption.

Gaining the radiologist's trust

Workflow at one practice is unlike another, based on different demographics, patient populations, data environments, prevalence of conditions and several other factors. As a result, AI algorithms that work well in one place may do little for or even hamper another's workflow.

For instance, for a period, Rhode Island Hospital's radiology department adopted an application for identifying intracranial hemorrhage on CT scans in the emergency

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department. While potentially beneficial in other facilities, the technology created delays in the busy ED's workflow and was eventually removed.

For AI to be useful, providers must also understand how to use it in their specific workflow, according to Atalay. "Does the AI live at the scanner, on the PACS station, or on a stand-alone workstation? Does every pertinent imaging study have to go to that site or through an application somewhere else before it is eventually reviewed?" he said. "To improve efficiency and efficacy — and not cause disruption — these tools should be directly and transparently integrated into the workflow."

The FDA, to date, has cleared over 200 AI applications for various uses in radiology, says **Dr. Bibb Allen**, FACR, chief medical officer for the American College of Radiology's Data Science Institute and a general diagnostic radiologist in the Birmingham Radiological Group at Grandview Medical Center in Alabama. He warns that FDA clearance does not equate to universal efficacy.

"We just can't rely on an FDA clearance to say, 'Right, it's FDA-cleared, so that means it can be used on every patient based on every example we have.' That's clearly not the case," he said.

Bias incorporated in the development and training process can also interfere with AI's clinical accuracy when deployed. "If there are racial differences or gender differences, and we haven't properly characterized that because we don't have enough of the various subpopulations, then we're at risk for not providing optimal care for our patients," said **Dr. Bradley Erickson**, professor of radiology and director of the Mayo AI lab.

Erickson says that larger, higher-quality data curated by standards is necessary for eliminating biases. In agreement is **Dr. James Brink**, enterprise chief of radiology for Mass General Brigham Health System, radiologist in chief at Mass General Hospital, and chair of radiology at Brigham and Women's Hospital, who says that the best way to go about this is to train and develop AI sequentially in various facilities with diverse demographics, populations, data environments, and different equipment and systems.

"By circulating algorithms in development among multiple sites, a federated approach to algorithm development can help eliminate the biases that would come with simply training in one environment with one demographic," he said.

Dr. Shandong Wu, a tenured associate professor of radiology and founding director of the Pittsburgh Center for AI Innovation in Medical Imaging, adds that more clinical trials are needed for AI evaluation, with only a handful currently underway worldwide.

He says that radiologists must be involved and perform rigorous assessments that result in evidence that not only shows how a specific model works but also helps understand why it is capable of performing a task.

"If the model can do some explainable diagnosis using radiologist-acquainted clues, that is helpful for physicians to understand how it works and to gain their trust and perspective," he said.

Overcoming roadblocks

With inflation through the roof and tighter margins, radiologists, like other clinicians, are concerned about their return on investment when it comes to the technologies they use and procedures they perform. This has been a major roadblock for the adoption of AI, with no standardized reimbursement system set up to compensate clinicians utilizing the technology.

And while CMS funding and designations such as the new technology add-on payment are a starting point, Allen says that a proper payment system is needed.

"There's not a good model for reimbursement, and CMS and other third-party payers may be questioning if AI adds value for patients in addition to what they already do. When we look at taking care of populations of people rather than our current transactional payment system, then AI becomes a resource that could make institutions more efficient. They would then gladly fund its implementation," he said.

Additionally, most AI models are currently designed to detect only one finding, maybe two, in patients. This limits their ability to make accurate diagnoses, leading to delayed care.

"Does it just detect one thing, like pulmonary embolism, but not pneumonia if applied to the chest," said Brink. "Is there a fracture? Is there a pulmonary embolism?" That doesn't necessarily answer the more concrete question, "Is there an abnormality in this chest X-ray or is there an abnormality in this femur?"

Another problem, according to Erickson, is the limited ability of the technology to pull information from multiple sources. Most only use information from the pixels found in images they scan and do not incorporate background information from prior exams and medical records.

"The vast majority of radiology requires clinical information integration and/or other imaging examination information in order to really do a good job. That's a much more challenging thing to do from an informatics perspective, and you need to train a more sophisticated AI model," said Erickson.

Because of these limitations, many radiologists have been left scratching their heads on what true value AI offers radiology and how to incorporate it into their practice.

"All of these studies need to be looked at by a radiologist," said Atalay. "It's not clear to me how AI will alleviate the number of studies a radiologist has to look at or the time spent on them. But that's the promise."

Educating the next generation

In a study of 532 medical students, 23% said they would not pursue a career in radiology, because they believe AI will eventually replace radiologists and limit their future job prospects. One class was surveyed twice, with 50% in 2017 saying radiology was a no-go for them. This rose to 71% in 2021.

Atalay, who led the study, says this indicates a lack of awareness about the role that radiologists play and what the full scope of their work entails. In addition to interpreting images, a significant fraction of their day is spent on noninterpretive tasks such as protocoling exams; determining if a specific scan is safe, effective, and appropriate for individual patients; interacting with the technologists

performing the exams; and discussing study indications and results with clinical colleagues.

He adds that it's important that students understand that current AI tools are "single-minded one-trick ponies" that only detect one or two abnormalities, versus a myriad of potential causes to explain a patient's condition, let alone a host of potentially important but unsuspected incidental findings.

"In essence, AI now and in the foreseeable future is an assist device helping radiologists perform their tasks. We in radiology already know this. But it is incumbent on us to share this with medical students and disabuse them of misconceptions. When medical students rotate through a radiology elective they are often surprised by the breadth and scope of our jobs," said Atalay.

Wu says that medical associations are beginning to do this by developing educational programs for students and current physicians and radiology leaders about what they can expect and need to know about AI and its use in their work. His own institution is creating structured training programs for educating students and clinical trainees, from the high school level to graduate school.

"We need to make them think with a right attitude toward AI, 'Ok. I understand what AI is, and I know what it does and how I can work with it. It will not usurp my career. In fact, this shows that radiology might be a more exciting career because of the strong component of AI in radiology,'" he said.

Interpreting the value of AI

Accelerating the adoption of AI in radiology and other medical specialties is a slow process and will take time. Refinements and the development of more sophisticated models, capable of performing multiple tasks and collecting more information will facilitate greater interest from radiologists by showing them the value it brings to their jobs and workflow.

Erickson says that as more advanced developments take shape, he is confident that radiologists will come to view AI as an assistant, and not a replacement. "There's so much more information in the images than what we can extract today, but I think as long as we remain engaged in how the AI tools are developed and deployed, that we're going to be at the center of that and not pushed aside."

In addition to ensuring more accurate diagnoses and optimal care, the technology will improve the patient experience and safety, as well as communication between radiologists and other clinicians, says Atalay. "It will potentially offer us guidance in terms of management that we can then pass on to our clinical colleagues who are directly managing these patients."

While refining these capabilities should be a central focus, ensuring equal access among different institutions is also important. "The big, well-endowed academic hospitals can't be the sole users of this new technology because they have enough money to pay for it. If the new technology is such a game changer, then patients in places like rural Alabama ought to have equal access," said Allen.

Wu also warns that as technology advances, solutions like AI will be more frequent targets of cyberattacks. As a result, radiologists and providers should have in place safety mechanisms for preventing these attacks from exploiting the technology and putting operations and patient care at risk.

"We want to make sure when we deploy something in the health informatics system or clinical workflows, that these softwares are safe to patient data in terms of what they do, and that there is awareness and solutions on preventing potential cyberattacks to the vulnerability of AI systems."

Leveraging the full potential of AI in radiology and addressing any gaps in its implementation requires radiologists, manufacturers, AI researchers and healthcare leaders to work together and be transparent about what they need in the development and training process.

Doing so will, in turn, ensure that the value that the technology brings to radiology is understood and embraced, while assuaging concerns about it replacing radiologists.

"I'm confident that the depth of diagnostic potential and the breadth of opportunities for advancing the diagnostic frontier will forever allow us to develop new diagnostic methods not yet imagined, and move that frontier toward more precise and more accurate diagnoses from where we are today," said Brink.

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CT Year in Review

From new systems to emerging best practices and increasing impact from artificial intelligence, presented in chronological order, here are the ten biggest CT stories of the year from our Daily News online.

Is proton CT superior to conventional CT for planning proton therapy?

Research in January showed that using proton CT instead of X-ray CT for proton therapy planning could spare patients from overexposure to radiation when undergoing multiple scans and may improve the accuracy of the treatment.

Proton therapy manufacturer ProtonVDA and researchers at Loyola University Stritch School of Medicine, Northern Illinois University and Loma Linda University found that proton CT reduced range uncertainties, which could allow radiation oncologists to potentially use smaller margins around tumors and more precisely deliver proton radiation to cancer sites.

The reason for this is because using X-ray CT requires the CT Hounsfield units to be converted into proton relative stopping power (RSP) to calculate proton range in the patient and generate a plan. This leads to uncertainties, which necessitates the need for wider margins. Proton CT directly measures RSP, which decreases uncertainties and may allow for smaller margins.

While small reductions in dose associated with a single scan are not likely to cause harm, the 10- to 100-fold decrease brought on by proton CT could enable scans to be repeated regularly, according to senior author James Welsh, a professor of radiation oncology at Loyola University Stritch School of Medicine.

The findings were published in *Medical Physics*.

MR-guided radiotherapy cuts side effects in half compared to CT for prostate

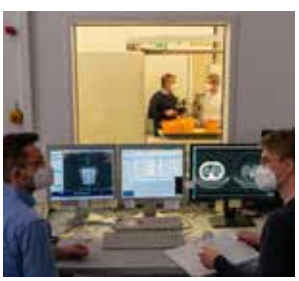
Scientists at the University of California, Los Angeles showed in February that using MR instead of CT to guide radiotherapy may result in fewer side effects for prostate cancer patients.

The findings are part of an interim analysis conducted during an ongoing Phase III randomized trial known as MIRAGE. Men undergoing SBRT for localized prostate cancer were randomly assigned to either CT-guidance or MR-guidance. Investigators assessed serious side effects or toxicities in both groups for 90 days following treatment and found those who underwent MR-guidance half as likely to experience treatment side effects.

When used with techniques such as high-dose stereotactic body radiotherapy, MR offers several theoretical advantages, including significantly reducing the need for planning margins in radiation. This is because the prostate and critical structures are more visible on MR than CT and because MR can perform real-time tracking to monitor the motion of the prostate

"This MRgRT platform obtains an MR four times a second and will 'turn off' the beam when the prostate moves outside of a preset boundary or margin. Because of these two features, we were able to significantly reduce the volume of tissue being targeted with radiation using MR-guidance. We hypothesized that this would in turn lead to less side effects," Dr. Amar Kishan, vice chair of clinical and translational research in the departments of radiation oncology and urology at UCLA Health Jonsson Comprehensive Cancer Center, told HCB News.

Researchers in Germany develop dark-field CT prototype



Researchers at the Technical University of Munich showed in February they could derive more insight about human tissue for diagnosis through a combination of CT scanning and dark-field X-ray imaging.

Dark-field imaging provides information that conventional X-rays cannot on fine tissue structures, especially the lung. In conventional X-ray imaging, X-rays are attenuated by intervening tissue as they travel to the source of the detector. This creates images with varying

degrees of attenuation that are based on tissue type and structures. When the X-rays interact with materials of different densities, such as an interface, they scatter. Dark-field imaging assesses this scattering effect to obtain more information on very fine tissue structures.

Technical challenges have made it hard to develop a dark-field CT device to the scale needed to assess human beings. But through their work, TUM researchers have developed a prototype that combines both technologies to produce 3D dark-field X-ray images. And it has already been used with a thorax phantom that depicts the upper human body and is large enough to repeat intended applications on real patients.

AI and CT combine to predict efficacy of immunotherapy for melanoma

Artificial intelligence has helped more accurately predict immunotherapy treatment outcomes for melanoma, according to Columbia University researchers in a March paper in JAMA Oncology.

The researchers created a machine learning algorithm that looked at patient CT scans and made a biomarker, called a radiomic signature, that correlated with "high accuracy" evaluating how well the melanoma would respond to immunotherapy.

Plans now call for the project to broaden to other types of tumors — including lung, colon, prostate and renal, and to treatments other than immunotherapy.

At present, tumor size is the main way to determine therapy benefit. "Most of the current response criteria were developed several decades ago to assess the response to systemic treatments like chemotherapy," noted first author Dr. Laurent Dercle of the Department of Radiology at the college. Since immunotherapy can lead to a transitory enlargement of tumors before a response, "we needed to create new tools in order to predict treatment success," he added.

Seven ways to optimize CT dose: study

After consulting with over 26 radiology leaders worldwide, in March, a group of researchers compiled the following list of seven strategies for optimizing CT dose and ensuring safe exposure to radiation during scans:

Engaging radiologists and technologists – Make discussing issues and proposing changes with a designated radiologist and CT technologist (typically the lead tech) a priority, and communicate changes to those working alongside them.

Creating a CT dose committee – Establish a structured, diverse and inclusive group to implement changes, set goals, develop protocols and manage reviews.

Manage organizational changes – Establish clear communication and keep everyone involved in talks. Educate staff.

Leadership and support – Provide resources and "man-hours" for completing necessary work. Aim for more than a "lukewarm leadership buy-in" to keep staff engaged and motivated.

Monitoring and benchmarking – Use dose information to make changes and set benchmarks. This can help show where one's focus should be for creating and adjusting protocols.

Modifying CT protocols – "Harmonize" protocols to limit variation and avoid confusion. Several participants agreed that their protocols were locked until everyone agreed to modify them.

Equipment and work rule changes – Invest in newer technology to optimize CT doses. While expensive, it is considered a worthwhile investment, according to the authors. Participants also listed work rules pertaining to developing department procedures and protocols that can be communicated through manuals.

The list was published in the *Journal of the American College of Radiology.*

Deep learning reconstruction sufficient at reducing dose in pediatric CT scans

In April, using deep learning-based reconstruction, Japanese researchers reduced the dosage in pediatric CT exams while still maintaining the same or even improving on the image quality of those using interactive reconstruction algorithms.

Because children are more sensitive to ionizing radiation, clinicians use the lowest possible dose when scanning them. One way to do that is to decrease tube voltage with iterative reconstruction. But lowering voltage increases image noise and impairs detection of low-contrast objects, especially when using reduced slice thickness to assess a child's small anatomic structures.

An emerging technique for CT image reconstruction, DLR uses a convolutional neural network to generate low-noise, high-quality images in short time frames, reports Physicsworld. The team applied the application to low-tube-voltage exams and reduced noise without degrading the noise texture and image sharpness.

The findings were published in the *American Journal of Roentgenology.*

FDA gives nod to Siemens' ARTIS icono ceiling CT angiography system

In July, Siemens Healthineers received FDA clearance for its ARTIS icono ceiling, a cone beam CT angiography system mounted to hos-

pital ceilings for routine and advanced interventional radiology and cardiology procedures.

The solution scans the head in 2.5 seconds and the left and right sides of the body in four seconds. The short 3D spin reduces motion artifacts and makes scans dependent on less contrast media.

Its OPTIQ image chain increases image quality across C-arm angles and different patient weights, while reducing dose to levels that adhere to the As Low As Reasonably Achievable (ALARA) guiding principal for radiation safety.

"With the ARTIS icono ceiling, Siemens Healthineers combines excellent image quality and a previously unseen level of design flexibility to be the angiography system of choice for an unprecedented number of interventional radiology and cardiovascular procedures," said Kris McVey, vice president of interventional radiology and cardiology at Siemens Healthineers North America, in a statement.

OPTIQ sets exposure parameters based on desired image quality. New rotational capabilities and simplified cabling of the C-arm reduce scanning time. The system's open architectural design enables vendor-neutral third-party applications to be integrated to keep it up-to-date, regardless of the vendor.

EHR guidelines decrease reliance on contrast-enhanced CT amid shortage

Implementing entry-based guidelines for EHR orders may enable large healthcare systems to significantly cut back the number of contrast-enhanced CT exams they perform while the global shortage of iodinated contrast media continues.

In a retrospective study published in August, researchers at Brigham and Women's Hospital looked at these exams performed at two large academic medical centers, seven community hospitals, three specialty hospitals and multiple affiliated ambulatory care centers. All used a single EHR System, Epic System's Hyperspace.

Among 78,792 patients who underwent at least one CT exam in outpatient, inpatient and emergency department settings, the authors found that interventions in EHR orders led to a decrease in procedures using contrast media.

"The number of patients undergoing contrast-enhanced CT examinations per day decreased by 12%, and the number of orders for CT with contrast media decreased by 15.2% per day," they wrote in the study.

EDs see jump in chest, abdominopelvic CT scans for trauma-related injuries

In August, researchers showed that chest and abdominopelvic CT scans rose among commercially insured patients for trauma-related ED visits between 2011 and 2018.

The largest gains were seen for single-encounter thoracabdominopelvic CT exams, which increased from 3.4 to 9.8 (1.16 per year) per 1,000 trauma-related ED encounters; and for minor injuries, which went from 1.1 to 4.6 (1.18).

This has raised concerns about higher costs and the detection of incidental findings. "Further investigation is warranted to explore the potential benefit of single-encounter thoracabdominopelvic CT examinations in patients with minor injuries, as well as strategies to optimize order appropriateness," wrote first author Dr. Ninad Salastekar, from the department of radiology and imaging sciences at Emory University School of Medicine, in a statement.

Salastekar and his team studied trauma-related ED encounters recorded in national claims that they extracted from the IBM MarketScan Commercial Database. ED encounters were organized using the Injury Severity Score (minor, intermediate, major) through the International Classification of Diseases codes. They assessed chest CT, abdominopelvic CT and single-encounter thoracoabdominopelvic CT.

The study was published in the *American Journal of Roentgenology.*

Philips debuts world's first spectral detector angio CT suite

In September, Philips announced it had combined its Spectral CT 7500 system and its Azurion image-guided therapy system with FlexArm to form the world's first spectral detector angio CT suite.

Designed to perform whole-body imaging in 2D and 3D, Azurion with FlexArm utilizes imaging systems, software and specialized diagnostic and therapeutic solutions to visualize critical anatomy so that clinicians can perform complex procedures.

Spectral CT improves detection, delineation and quantification of lesions to better plan minimally invasive operations. It also has shown more sensitivity in detecting malignant findings and improving readings of incidental findings.

Using Philips' scanner allows clinicians to image patients only once to distinguish and quantify different tissues. Together, both solutions will allow clinicians to explore potential new treatments and improve minimally invasive procedures in oncology, stroke and trauma care.

"We cannot only visualize better but also quantify, for example, iodine uptake in the tumor with an embolization. Or using Spectral information to define treatment success before the patient leaves the room," Karim Boussebaa, general manager of image-guided therapy systems at Philips, told HCB News.

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AI Year in Review

As the healthcare industry continues to grow more familiar with what artificial intelligence is, as well as what it isn't, new research is providing an increasingly clear-eyed look at how these advanced processing systems could fundamentally change medicine. Here, presented in chronological order, are the top ten biggest AI stories of the year from our Daily News online.

IBM sells Watson Health to investment firm Francisco Partners

In January, global investment firm Francisco Partners bought the data and analytics business of IBM's Watson Health.

The company took various parts of Watson Health, including Health Insights, MarketScan, Clinical Development, Social Program Management, Micromedex and Imaging Software Offerings. This gives it access to a broad array of health data, which it plans to use to create a new stand-alone company. It also will retain IBM's management team for the data and analytics business, according to TechCrunch.

While neither company disclosed terms, previous reports said IBM was aiming to take away $1 billion from the sale. "Today's agreement with Francisco Partners is a clear next step, as IBM becomes even more focused on our platform-based hybrid cloud and AI strategy. IBM remains committed to Watson, our broader AI business, and to the clients and partners we support in healthcare IT," Tom Rosamilia, IBM Software's senior vice president, said in a statement.

Oxipit scores CE Mark for first autonomous AI application, ChestLink

Oxipit nabbed European approval for ChestLink in April, the first AI application designed to conduct diagnostic evaluations of chest X-rays alone without help from radiologists.

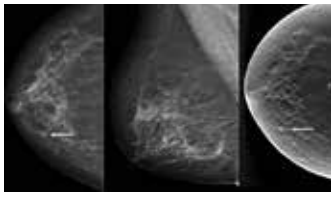
The company scored the CE Mark for its solution, which it says will help alleviate radiologist shortages by automating between 15% to 40% of daily reporting workflows, depending on the type of medical institution. It can now be deployed in 32 European countries.

When highly confident that X-ray scans show no abnormalities, ChestLink produces final reports for healthy patients. Oxipit says that these X-rays would appear normal to trained professionals and that by automating the work for them, ChestLink gives them more time to focus on patients and complete other important tasks. It takes into account aspects of patient age, clinical context and varying radiologist subjectivity.

Fully autonomous ChestLink operations in a clinical setting are expected to start in early 2023, according to company CEO Gediminas Peksys. "The sensitivity metric of 99% has translated to zero clinically relevant errors at our deployment institutions during the application piloting stage."

The solution is based on Oxipit ChestEye, an earlier platform developed by the company for preliminary chest X-ray reports. Oxipit ChestEye can identify 75 radiological findings, which makes up approximately 90% of the abnormalities that radiologists encounter daily.

AI proves worth as second reader for mammograms



Based on its ability to detect cancer, artificial intelligence may serve as a sufficient second reader for mammograms and reduce the workload on radiologists.

That's what researchers in Norway said in an April study comparing the technology's performance to routine independent double reading in a population-based screening program.

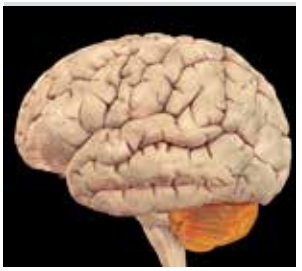
The largest of its kind, the study assessed the use of AI in reading almost 123,000 exams performed on over 47,000 women from four facilities in BreastScreen Norway, the country's population-based screening programs. Such programs conduct so many mammograms

that produce significant workloads for radiologists and can lead to backlogs and longer waiting times for patients. And while AI has shown encouraging results in identifying cancer, its use in real screening settings is limited.

Using a commercially available AI system, the researchers were able to identify and eliminate a high percentage of benign exams from their workload, as well as find the majority of screen-detected cancers. Less than 20% of screen-detected cancers were not identified.

The findings were published in *Radiology*.

AI-enabled ECG detects risk of stroke and cognitive decline



AI-enabled ECG algorithms may be able to detect more than just risk of atrial fibrillation, but stroke and cognitive decline as well.

One-third of ischemic strokes are associated with atrial fibrillations and can affect a person's cognitive functioning. In previous studies, AI-enabled electrocardiography has identified brief episodes of atrial fibrillation and been able to predict the risk of it by up to 10 years prior to a clinical diagnosis.

In May, researchers at Mayo Clinic found that the technology may also be able to identify patients who are at greater risk of cognitive decline. The algorithm showed that a high probability of atrial fibrillation was connected with the presence of infarctions (incidents of cerebral stroke) on MR.

The name of the study is Artificial Intelligence-Enabled Electrocardiogram for Atrial Fibrillation Identifies Cognitive Decline Risk and Cerebral Infarcts. "Artificial intelligence-enabled electrocardiography acquired during normal sinus rhythm was associated with worse baseline cognition and gradual decline in global cognition and attention. The findings raise the question whether initiation of anticoagulation is an effective and safe preventive strategy in individuals with a high AI-ECG algorithm score for reducing the risk of stroke and cognitive decline," said Dr. Jonathan Graff-Radford, a Mayo Clinic neurologist and the study's corresponding author.

Assessing sinus-rhythm ECGs of 3,729 patients, the authors found that ECG atrial fibrillation scores correlated with a lower baseline and faster decline in cognitive scores. One-third of patients also had an MR, and cerebral infarcts detected with it were linked to high atrial fibrillation probability.

GE Healthcare and Alliance Medical partner on AI for UK radiology operations

GE Healthcare and Alliance Medical, an imaging provider in Europe and the U.K., announced in May they would use advanced data analytics and AI solutions to help British radiology departments bolster their productivity.

The two are working on a digital solution that will streamline daily management and apply proactive problem solving to high-patient volumes, schedule disruptions and inconsistent processes. They are aiming to open up patient access to diagnostics and establish standardization within practices, while reducing staff burnout.

To do this, the two will use multiple data analytics tools and remote collaboration products designed by GE Healthcare to help radiology departments optimize operations, introduce more consistency, facilitate virtual collaborations with experts and make care more cost-effective and faster. Alliance Medical will provide clinical expertise on patient care, daily management of patient pathways and problem solving.

"The future of healthcare information is around how to manage and collate data to improve the decision-making, patient pathways and ultimately, in the case of radiology, speed of diagnosis. A digital partnership like this offers a new level of visibility to radiology departments to help manage the high patient volumes," Simon McGuire, general manager of GE Healthcare Northern Europe, told HCB News.

Researchers diagnose Alzheimer's with one MR scan and AI

A single MR scan, combined with AI, may be the only tool needed to make an accurate Alzheimer's diagnosis.

In June, researchers at Imperial College London identified the disease in 98% of cases, with a standard 1.5T MR scanner and machine learning technology that detected structural feature changes within the brain, including in areas not previously linked to Alzheimer's. They also distinguished between early and late stages with fairly high accuracy, in 79% of patients.

They say the approach could enable faster diagnoses and earlier ones that allow patients to get support and treatment in advance. It also could help to understand brain changes that trigger the disease and identify participants for clinical trials for drugs and lifestyle changes, which is currently difficult to do.

Professor Eric Aboagye, from Imperial's department of surgery and cancer, who led the research, told HCB News that current diagnoses are made with multiple memory and cognitive tests and brain scans that take weeks to arrange and then process. "This will provide a simple and accessible, yet accurate, method that will become the main tool for identifying Alzheimer's."

Aidoc poised to expand AI beyond radiology via $110 million funding round

In June, AI software developer Aidoc announced it raked in $110 million in a Series D investment round that will go toward expanding its AI Care Platform throughout the entire hospital enterprise.

Founded in 2016, Aidoc designs AI-based software to detect and alert radiologists to critical issues found on CT and X-ray scans, to help triage and prioritize cases. Its AI Care Platform has 15 FDA-

cleared clinical applications, including for stroke, pulmonary embolism and brain hemorrhages.

This latest round brings the company's total funding to $250 million, which it will use to make its platform a tool to help various healthcare professionals as they grapple with challenges created by staff and supply shortages and rising prices.

The round was co-led by global investors TCV and Alpha Intelligence Capital, with participation from AIC's co-investor CDBI Capital. "Our aim is to massively ramp up our AI Care Platform to cover both the various hospital medical service lines and the depth of integration into the clinical workflows, empowering hospitals to activate cross-specialty care teams and deliver the best quality of care in a scalable, efficient way to patients," said Elad Walach, CEO of Aidoc, in a statement.

Northwell taps Google Cloud to scale digital operations

Northwell Health announced in July it would leverage Google Cloud and AI to bolster its digital operations to make care better and access more equitable.

The New York healthcare system will adopt Google Cloud as its preferred platform for modernizing its infrastructure, and use the company's AI and machine learning technology to improve digital scheduling, automate payer interactions, and summarize medical information. It also plans to use these applications for capacity planning, as well as to identify risk indicators of when early interventions are necessary.

"People want the same kind of seamless experiences and access to their healthcare that they have in other areas of their life, and healthcare providers need to meet these demands while also running the organization more efficiently," said Joe Miles, managing director of global healthcare and life sciences solutions for Google Cloud, in a statement.

With Google Cloud, Northwell will build an interoperability data platform with AI and machine learning capabilities that collects and uses information from different patient records for recommendations and decision support. The healthcare system will combine its security, privacy controls and processes with Google Cloud's infrastructure to protect access to this data.

UPMC partners with Microsoft, using clinical analytics to improve care

The University of Pittsburgh Medical Center said in July that it integrated Microsoft's cloud computing, AI and machine-learning tools into its clinical analytics operations to adjust care protocols and foster better health outcomes.

Outlined in a five-year agreement, UPMC will use these solutions to mine more than 13 petabytes of structured clinical data and 18 petabytes of imaging data to develop care insights.

Using clinical data to adjust COVID-19 treatments, the hospital reduced in-hospital mortality during the pandemic and is now applying the same concept to other areas, including diabetes mellitus and post-surgical adverse outcomes.

"We're on a quest to become a true data-driven organization, a 'learning health system'. We can do this only if analytics are embedded in everything that we do — from the executive suite to our clinicians at the bedside," said Dr. Oscar Marroquin, chief healthcare data and analytics officer, in a statement.

During the pandemic, UPMC used clinical and financial data to reduce in-hospital mortality month-to-month. It has replicated these efforts with diabetes mellitus, which is associated with a higher risk for other conditions and adverse outcomes, especially in those with poor control of their disease.

Using historical data from more than 170,000 diabetic patients, the analytics team built a machine-learning model to predict those at highest risk before they reach that point, enabling endocrinologists to offer these patients diabetes educators.

Addressing bias in radiology machine learning systems

Suboptimal practices in the development of machine learning systems put them at risk of producing biased insights when applied in radiology.

In September, researchers at Mayo Clinic announced they had come up with several strategies for addressing developmental problems and eliminating the risk of biased information, with the first focusing on the data handling process and the 12 suboptimal practices associated with it.

"If these systematic biases are unrecognized or not accurately quantified, suboptimal results will ensue, limiting the application of AI to real-world scenarios," said Dr. Bradley Erickson, professor of radiology and director of the AI Lab at the Mayo Clinic, in Rochester, Minnesota, in a statement.

The researchers recommend in-depth reviews of clinical and technical literature and working with data science experts to plan out data collections. They also say collections should come from multiple institutions in different countries and regions, use data from different vendors and different times, or include public data sets to incorporate diverse data sets.

"Creating a robust machine learning system requires researchers to do detective work and look for ways in which the data may be fooling you," said Erickson. "Before you put data into the training module, you must analyze it to ensure it's reflective of your target population. AI won't do it for you."

The second and third reports discuss biases that occur when developing and evaluating the model, and when reporting findings.

The findings were published in Radiology: Artificial Intelligence, a journal of the Radiological Society of North America.

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The latest in radiography and fluoroscopy

By Lisa Chamoff

For all aspects of imaging, manufacturers have an eye toward streamlining workflow and improving image quality. New radiography and fluoroscopy solutions integrate automation and image enhancements while continuing to keep radiation dose low.

Mobile X-ray systems are incorporating more advanced applications and, on the detector side, equipment is getting lighter and providing higher-quality images.

Here is what's new in radiography and fluoroscopy from several companies.

Carestream

Carestream recently launched its new Focus HD 35 and Focus HD 43 detectors. They feature a 100-micron pixel pitch that provides higher resolution for improved image details and allows for image magnification for better visibility of small objects and microstructures.

The pixel pitch is smaller than Carestream's Focus 35C and 43C detectors. The new detectors are also lighter-weight and have a higher IP rating of IP56 for better protection against dust and fluid ingress. They are also competitively priced for facilities looking to upgrade to full wireless DR.

The detectors are compatible with a wide variety of DR systems and are also available as a retrofit solution.

"The Focus detectors present an ease of entry price into wireless DR technology and provide excellent image quality," said **Jill Hamman**, worldwide marketing manager for global X-ray solutions at Carestream Health.

Carestream Focus HD 35 and 43

GE Healthcare

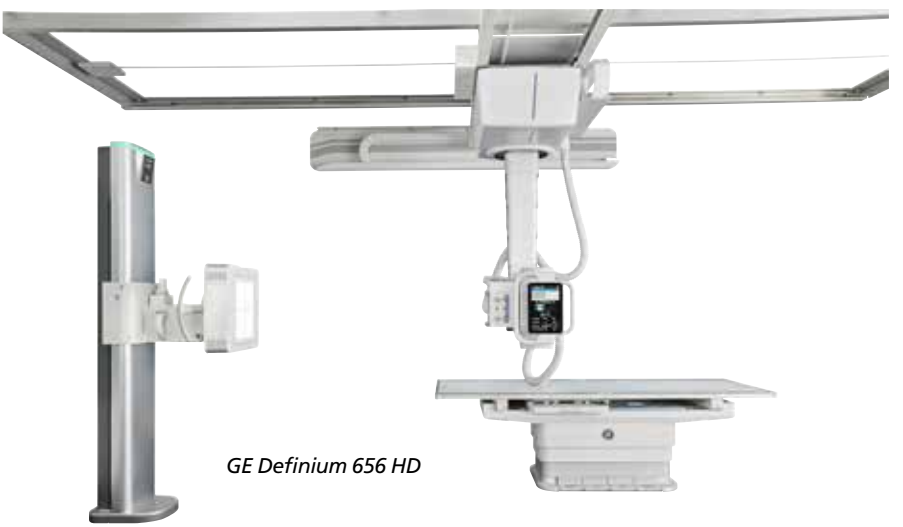
In August, GE Healthcare released the Definium 656 HD, a fixed X-ray system that comes with automation, assistive intelligence and advanced application, as well as what the company says is the fastest movement and highest weight capacity in GE Healthcare's fixed X-ray portfolio.

"The system acts like a 'personal assistant' to help technologists deliver consistent, efficient and highly automated imaging exams that impart clinical confidence across the radiology department, while also improving overall patient experience by keeping workflow control in the room for healthcare providers," said **Tanya Lancaster**, general manager for Global Fixed X-ray at GE Healthcare.

To minimize variability and improve diagnostic confidence, the Definium 656 HD includes 100 µm FlashPad HD detectors and the latest Helix 2.2 advanced image processing software with on-device artificial intelligence (AI).

"These advanced technologies combine to provide outstanding clarity and exceptional anatomical detail across 59 different image types, with anatomy-specific image enhancement regardless of variations in dose, patient positioning, field of view and metal," Lancaster said.

The Definium 656 HD also features the Intelligent Workflow Suite which leverages 3D camera technology to help produce more



GE Definium 656 HD

consistent images and solve for common errors and inefficiencies within the imaging department. The suite includes Position Assist to help address positioning efforts, Technique Assist to help address poor image quality due to incorrect patient habitus and Patient Snapshot to help radiologists understand the ambiguities in the image due to imaging conditions.

In late 2021, the company launched its latest mobile offering, the AMX Navigate, that was launched in late 2021. It was tested in locations with extreme weather conditions, including the Mojave Desert and Kiruna, Sweden, one of the coldest places in the world.

FUJIFILM Healthcare Americas Corporation

In November 2021, FUJIFILM Healthcare Americas Corporation expanded its C-arm portfolio with the launch of the Persona CS mobile fluoroscopy system, a compact, lightweight system designed to provide enhanced live image guidance during a wide range of surgeries in the OR, including orthopedic, pain management and emergency procedures.

This past July, Fujifilm launched the FDR Cross, a wireless hybrid C-arm and portable X-ray solution designed for hospitals and ambulatory surgery centers. The dual-function C-arm offers portable fluoroscopic imaging and radiographic imaging on a single platform, with what the company says is the world's first pivoting tube coupled with a removable detector. It can run on battery power for up to eight hours.

Both systems feature a larger-than-typical C-arm opening to provide better spacing for procedures, and both weigh significantly less than typical systems, making them easier to position in tight spaces, said **Rob Fabrizio**, director of strategic marketing for diagnostic imaging at FUJIFILM Healthcare Americas Corporation.

"The Persona CS and the FDR Cross are built on latest DR detector technology to provide high-resolution real-time fluoroscopy images, allowing the surgeon to better visualize progress with minimal dose, at any point during the operation, and to immediately make any corrections that may be required," Fabrizio said. "Since they are built on DR capture, these systems provide outstanding image quality for still X-rays, instead of having to use a lower-resolution last image hold. Also, since they are built on DR capture, the field of view is larger, allowing surgeons to see more with every view and not need to capture as many images."

FUJIFILM Persona CS

The Persona CS mobile fluoroscopy system is available with 21-centimeter by 21-centimeter or 30-centimeter by 30-centimeter amorphous silicon flat panel DR detectors that

require about 30% less dose than traditional systems on the market, Fabrizio said. The system features a 27-inch touchscreen monitor and removable grid for low-dose applications.

JPI Healthcare Solutions

In 2022, JPI Healthcare Solutions released its new ExamVue Duo acquisition software for the company's radiology equipment. ExamVue Duo streamlines technician workflow for busy clinics and imaging centers with touchscreen monitors, and also offers customizable tools for smaller clinics and private practices.

ExamVue Duo is also being incorporated into the company's fluoroscopy solutions and upcoming CT and tomographic releases for 2023, including the Strixion Orthopedic Tomography system and CBCT systems.

JPI Strixion

KA Imaging

KA Imaging is preparing to introduce the Reveal Mobile System, which will be powered by the company's patented SpectralDR technology in the Reveal 35C detector. The technology enables dual-energy subtraction.

"We are very excited as it will be the first fully integrated mobile system capable of providing not only high-quality digital radiographs but also spectral images of bone and soft tissue simultaneously," said **Robert Moccia**, vice president of U.S. sales for KA Imaging. "With all the clinical benefits that are already associated with dual-energy subtraction, being able to offer it in a mobile solution is a great fit for the world's needs today."

Previous technical limitations didn't allow for dual-energy imaging on a mobile system, Moccia said. The SpectralDR technology now makes it possible, with energy separation taking place inside the detector.

Research has explored the clinical benefits of dual energy for a number of applications, including pneumonia and pneumothorax, finding line and tube tips and triaging for pulmonary nodules or coronary calcium.

"What we did is simply take dual energy to another level by increasing access, to a point where it can really become mainstream," Moccia said. "We are in contact with radiologists and they are very optimistic about the new possibilities enabled by the SpectralDR technology in the ICU, in the emergency room and even in the operating room."

Konica Minolta Healthcare Americas

Earlier this year, Konica Minolta Healthcare Americas introduced the mKDR Xpress Mobile X-ray System, which incorporates both the company's Dynamic Digital Radiography technology, which visualizes anatomy in motion, and its new AeroDR Glassless High-Definition Flat Panel Detector.

The DDR technology uses algorithms to create a moving picture from a rapid acquisition of a series of radiographs.

"It's the first detector that can actually do dynamic imaging wirelessly," said **Guillermo Sander**, director of marketing and digital radiography for Konica Minolta Healthcare.

The glassless AeroDR detector is light, weighing in at 4 pounds.

"We kept the robust structure of the panel and we made it more ergonomic with channels for the technologist's fingers for easier holding and use," Sander said.

The company is also introducing a new traditional overhead X-ray system that can perform dynamic imaging.

"You can basically have dynamic imaging across the continuum of care for the patient regardless of location," Sander said. "Having the technology available in many different configurations makes it easy for everybody to access it."

LG

In April, LG released the 3MP IPS Diagnostic Monitor for radiology reading rooms. It is thinner and lighter than the company's previous monitors and comes with lighting on the back of and underneath the monitor to help with visibility in the dark rooms.

The company also released a new line of detectors with a better IP rating than their previous generations. New detectors will also come equipped with an internal hot swap battery.

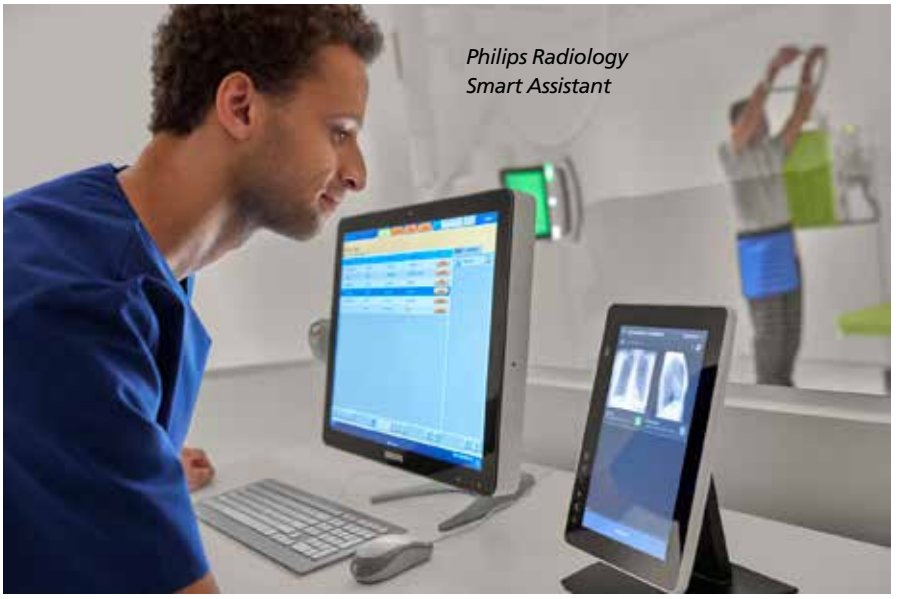
The detector comes in a 10-inch by 12-inch size for pediatric imaging, as well as 14-inch by 17-inch and 17-inch by 17-inch sizes.

LG also released Version 3 of its post-processing engines that has improved image processing featuring consistent X-ray image generation.

Philips

Recently, Philips announced that its CombiDiagnost DRF 7000 R, a remote-controlled fluoroscopy system in combination with high-end digital radiography, received 510(k) clearance from the FDA. The system is designed to improve room utilization in a cost-effective manner. The system combines a fully digital workflow, the company's UNIQUE image quality and dose management for a wide range of examinations from pediatric to bariatric imaging. Together with the ProxiDiagnost DRF 7000 N, which is a nearby-controlled fluoroscopy system, the DRF 700 R complements the fluoroscopy capabilities.

KA Imaging Reveal 35C detector



Philips Radiology Smart Assistant

Over the past year, Philips released a product in Europe called Philips Radiology Smart Assistant. The AI technology, which is 510(k) pending, works with Philips' fixed radiography and fluoroscopy systems to deliver immediate feedback to the technologists on patient positioning and image quality. Solutions like Radiology Smart Assistant and the live camera in the radiography system DR 700 C help radiographers spend more time with the patient.

Philips also introduced the Lunit INSIGHT CXR to help prioritize reading lists and areas of interest starting with mobile radiography images for radiologists.

The Philips premium DR & DRF portfolio has a similar look and feel regardless of whether it is radiographic or fluoroscopic, which helps with staff training and user adoption.

"When technology works as a seamless extension of your skill set, first-time-right results become standard," said **Sascha Dauber**, general manager for diagnostic X-ray at Philips. "Philips continuously innovates toward smart and intuitive workflows, which enables radiographers and radiologists to focus on the patient. Connecting data, technology, and people helps turn defining moments in the radiology workflow into a clear care pathway, with predictable outcomes for every patient. These smart workflow innovations improve throughput, reduce retakes, and increase return on investment."

Siemens True2Scale, Multitom Rax

Siemens Healthineers

Earlier this year, Siemens Healthineers introduced the True2scale Body Scan feature for the Multitom Rax radiography/fluoroscopy system, which has been on the market since 2015.

True2scale performs full-body slot scanning using tomosynthesis, taking up to two panoramic images in one run with no stitching required and no distortion in the images.

Patients can be scanned while seated, standing or supine. The beam is tightly collimated with a low radiation dose, said **Martin Pesce**, X-ray product manager at Siemens Healthineers North America.

"You can do the whole body in 14 seconds," Pesce said. "For orthopedic surgeons this is a big step up."

There are also applications for severe scoliosis and surgical planning for spinal rods with the ability to image the spine in a weight-bearing position.

The technology was FDA cleared in August. Current customers will receive a software upgrade.

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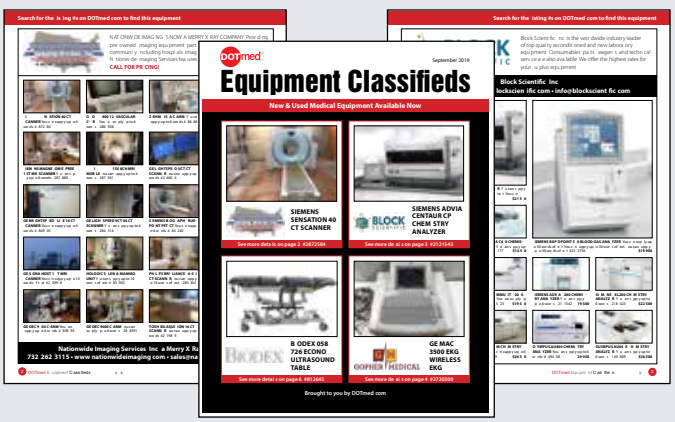

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Deep learning is having a deep impact on imaging

By Jan Makela

Deep learning (DL) is literally transforming the field of imaging. Applications such as imaging interpretation and workflow simplification have already been widely discussed in the industry, but we are also finding enormous potential for DL algorithms in image reconstruction and acquisition. Here, we see a strong path to simultaneously improve image quality and reduce scan time compared to prior approaches.

DL-enabled advanced digital technologies are taking imaging to the next level of advanced capabilities by updating existing equipment with new software to provide clinicians with more robust, accurate, and data-driven information than ever before. By avoiding many of the shortcomings of traditional algorithms, DL is improving on previous versions of the iterative reconstruction (IR) imaging process.

A subset of machine learning, DL utilizes deep neural networks, which consist of layers of mathematical equations and millions of connections and parameters that get trained and strengthened based on the desired output. In doing so, it is making a significant leap forward in efficacy compared to previous processes that require more human intervention, because DL can handle complex models and vast numbers of parameters with ease.

Indeed, the industry has progressed beyond conventional IR and has entered an era of DL image reconstruction. And the breakthroughs in applying DL to imaging are quite stunning. For example:

- One emerging DL-based technology focusing on computed tomography (CT) imaging is aiming to solve the long-standing issue of having to choose between image quality and dose. Providing natural looking image quality, even at a low dose, this high-speed workflow can reconstruct a heart in less than a minute and an abdomen or pelvis in about 90 seconds.
- Similarly, with respect to magnetic resonance imaging (MRI), the DL-based image reconstruction algorithm helps address the age-old issue of having to compromise between image quality and scan time. The DL platform provides MR images that are reconstructed from raw data to achieve extraordinarily high-fidelity resolution, and can enable scan time reduction by up to 50%.
- And DL's benefits are now expanding even further to positron emissions therapy-computed tomography (PET/CT) imaging, aiming to help provide clinicians image quality performance comparable to hardware-based Time-of-Flight, such as contrast-to-noise ratio and contrast recovery.

While artificial intelligence (AI) has been actionable for quite a while, its DL component has evolved significantly in recent years, especially in healthcare and, more specifically, in imaging. That's because the "learning" that takes place in a DL solution is quite literal. In our own research, we've seen that a deep learning image reconstruction (DLIR) solution is only as good as the training it receives. Drawing on a repository of millions of low-noise, filtered back projection images, these are entered as "ground truth" images into the platform. The result is imaging that achieves impressive levels of clarity.

The advantages of this approach can't be understated. An easy, information-rich interpretation experience helps provide diagnosticians not only with the confidence they require, but also helps improve scan read times and combat radiologist fatigue. This is especially important as case totals grow, due to 6.5 million MR procedures being deferred or cancelled at the height of the COVID-19 pandemic.

We're also seeing significant advancements in detector technology, including the delivery of two times the sensitivity in certain PET/CT platforms compared to previous versions. This can result in improvements in small lesion detectability and faster total scan times; the latter factor is especially important for those who have difficulty remaining still during imaging exams, including pediatric, neurodegenerative and geriatric patients.

Through these and numerous other technological advancements, DL is ushering in a new era of image quality. With improved visibility, pinpoint precision and faster scan times, DL is verifiably improving the scanning experience for radiologists, clinicians and patients alike.

About the author: Jan Makela is president and CEO, Imaging, at GE Healthcare.

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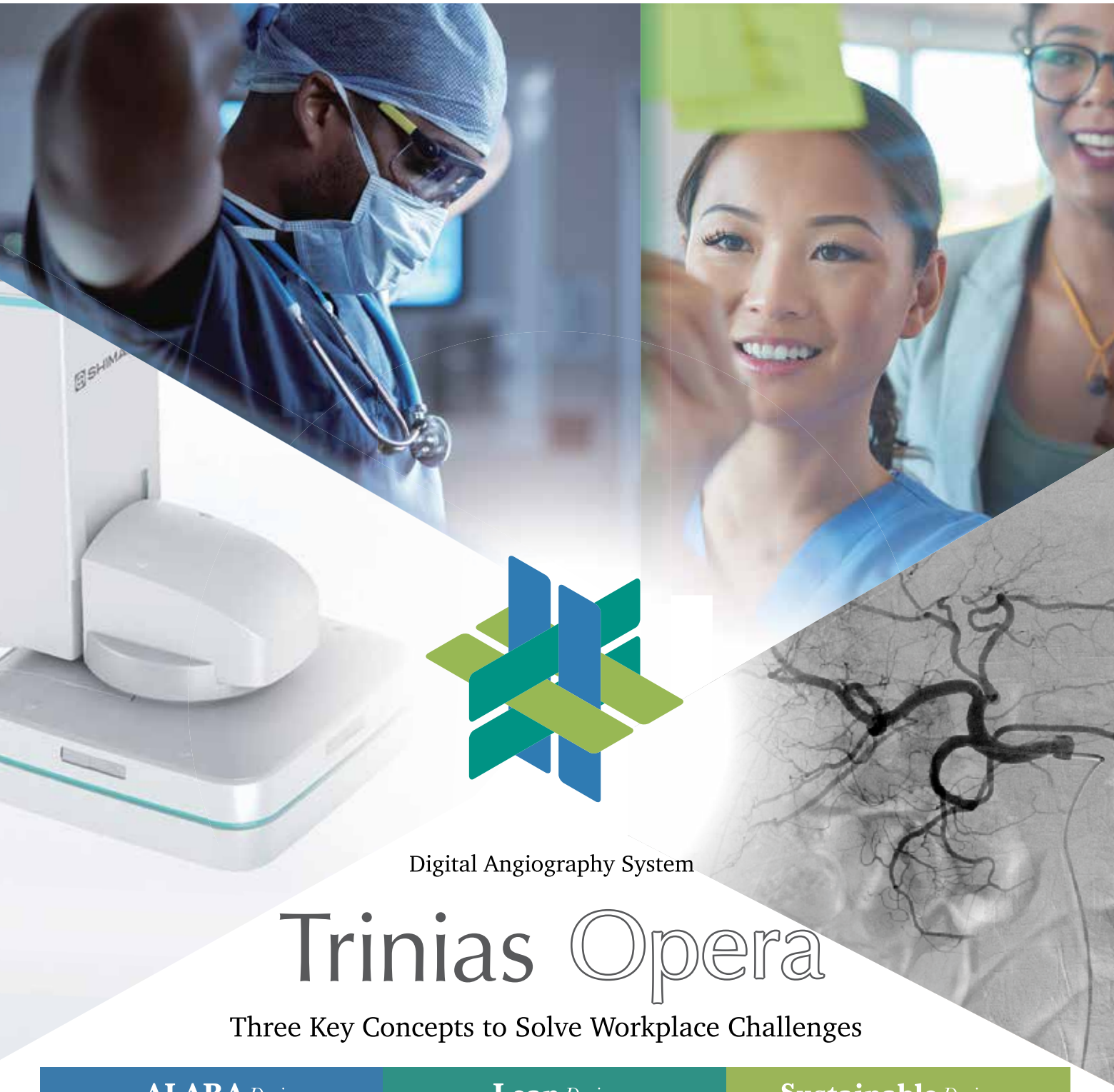

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