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January/February 2020

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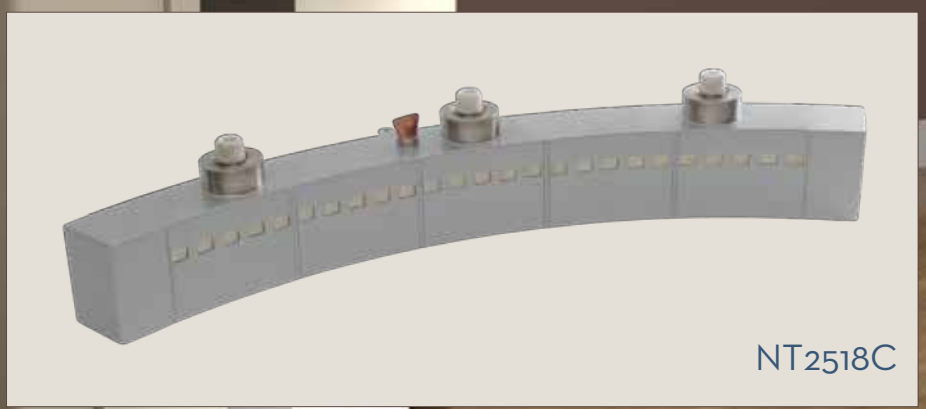

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DOTmed HealthCare Business news

PUBLISHER DOTmed.com, Inc.
CEO Philip F. Jacobus
PRESIDENT Matt Ulman

EDITOR IN CHIEF Gus Iversen
212-742-1200 Ext. 233
giversen@dotmed.com

EDITORIAL

CONTRIBUTING EDITOR Sean Ruck
STAFF REPORTER John R. Fischer

CONTRIBUTING WRITERS Julie Andrews, Lisa Chamoff, Mike Cannavo, Don Dennison, Valerie Dimond, Lauren Dubinsky, Thomas Dworetzky, Al Gresch, Art Larson, James Laskaris, John W. Mitchell, Vivian Nguyen

COPY EDITOR David Imber

PRODUCTION ASSISTANT Mai Hiraoka

DESIGN

DESIGN DIRECTOR Stephanie Biddle
DESIGN CONSULTANT Oscar Polanco

SALES

SALES DIRECTOR David Blumenthal
212-742-1200 Ext. 224
dblumenthal@dotmed.com

KEY ACCOUNT MANAGERS Susan Minotillo
212-742-1200 Ext. 261
sminotillo@dotmed.com

Connie Goon
212-742-1200 Ext. 289
cgoon@dotmed.com

ACCOUNT MANAGERS Colm Ford
212-742-1200 Ext. 241
cford@dotmed.com

George Persin
212-742-1200 Ext. 260
gpersin@dotmed.com

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Letter from the Editor

What do you like best about this magazine?

For the HealthCare Business News editorial team, attending the annual RSNA meeting in Chicago is an incredible opportunity to reconnect in person with the radiology community. We spend so much of our year tethered to our desks, writing emails and having quick no-nonsense phone calls, that it's easy to lose sight of the people and personalities who make up this medical network that we are a part of.

No member of that network is more important than you, the person taking a break from your day to skim through my letter and read our latest issue. Whether you're a hospital executive, an imaging department manager, overseeing purchasing decisions, leading a team of clinical engineers, or working on the OEM side, we want to ensure that our content is meaningful to you and helping you make better informed decisions in some small way or another.

If you read my letter on a regular basis you know that it usually addresses some of the topics we will be covering in the issue or some of the biggest breaking news we've been covering online, but this time I am writing to you with a different message: I want to know why you read HealthCare Business News.

Is it for the coverage of new equipment entering the market? Is it for the thought leadership? Or perhaps the trade show insights? Do you have a favorite column that you try to read every month? What, in your view, sets us apart from the crowd? If you have a spare moment, after you've set down this magazine, send me a short note letting me know what you think.

It's hard to believe that this will be our 14th year publishing HealthCare Business News (formerly DOTmed Business News). With your feedback we can make this our best year yet. And speaking of which, here's wishing you a healthy and prosperous 2020!

You can reach me at giversen@dotmed.com – I look forward to hearing from you!

Thanks for reading,

Gus Iversen
Editor in Chief
giversen@dotmed.com
Twitter: @dotmedcom

Healthcare hacks skyrocketed in October

Posted online December 02, 2019 by Thomas Dworetzky

Healthcare data breaches abounded in October — up 44.44 percent month-over-month with 52 reported to the HHS' Office for Civil Rights.

All told, 661,830 records were exposed, wrongly disclosed, or stolen in the process of these episodes, according to a report in the HIPAA Journal.

"This month takes the total number of breached healthcare records in 2019 past the 38 million mark," stated the report.

The largest five October breaches were topped by one at Betty Jean Kerr People's Health Centers where hackers exposed 152,000 records. Next biggest hack — at 140,209 records — was at Kalispell Regional Healthcare, followed by the hacking of the Methodist Hospitals, during which 68,039 records were exposed. Fourth was an unauthorized access of 37,952 records at Children's Minnesota Healthcare Provider, and fifth largest incident at 31,787 records hacked at Tots & Teens Pediatrics.

The Betty Jean Kerr People's Health Centers breach was a ransomware attack, during which the files were encrypted. No money was paid and the files were lost.

The Kalispell Regional Healthcare incident was the result of phishing — as was the attack at the Methodist Hospitals.

During October, a total of just over 500,000 records were compromised in 18 hacking incidents, as well as 28 "unauthorized access" events that exposed about 135,000 records. Another 5 theft or loss events involved over 13,000 records.

Healthcare providers were the hardest hit in the month with a total of 45 incidents, followed by three at health plans and four at businesses linking to HIPAA-covered organizations.

The issue of healthcare data protection recently prompted a November 15 letter from U.S. Sen. Mark Warner (D-VA), vice chairman of the Senate Intelligence Committee and co-founder of the Senate Cybersecurity Caucus, to the Department of Health and Human Services (HHS) regarding possible risks related to the proposed rule by the Centers for Medicare and Medicaid Services (CMS) that would require CMS-funded health plans (including ACA marketplace plans) to let patients access their personal data through third-party consumer applications.

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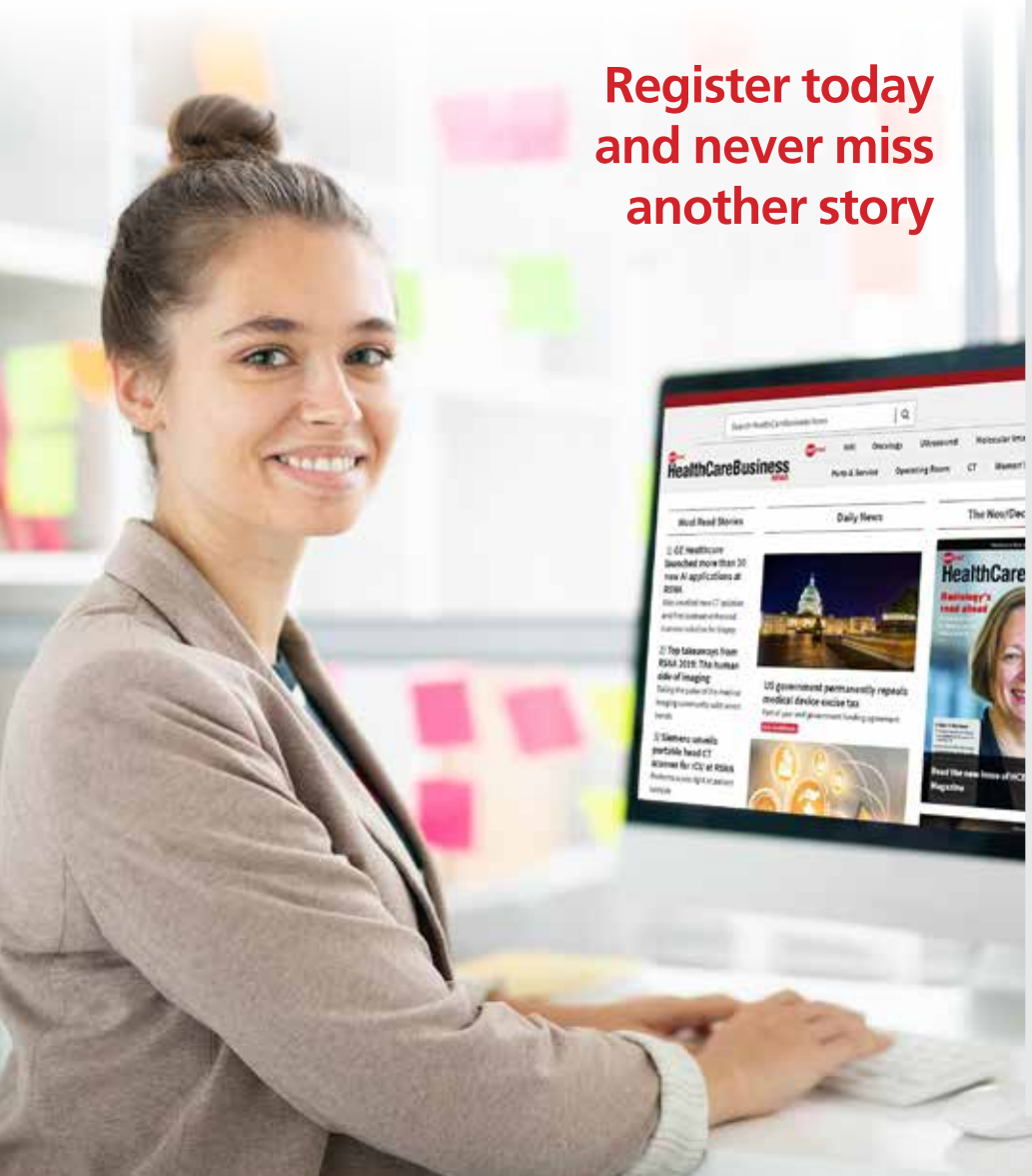

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US government permanently repeals medical device excise tax

Posted online December 23, 2019 by John R. Fischer

The controversial medical device excise tax (MDET) is officially dead following the signing of a year-end government funding package Thursday by President Donald J. Trump.

The president signed the roughly $1.4 trillion agreement just before a midnight deadline, avoiding a government shutdown. A measure for the repeal was included as part of the agreement, which was given the green light by the U.S. House of Representatives on Tuesday in a vote of 297 to 120, and on Thursday by the Senate in a vote of 71-23. A component of the Affordable Care Act, the MDET levied a 2.3 percent tax on the sale of each individual medical device intended for diagnosis and treatment, an action which manufacturers asserted led to decreases in development and research for patient care, created an unfair competitive landscape between small and large manufacturers, and forced jobs to be cut in the medical device industry.

"One of the key strengths of our industry is the diverse number of large and small innovative device manufacturers in the ecosystem," Patrick Hope, executive director of the Medical Imaging and Technology Alliance, told HCB News. "These firms are heavily engaged in the R&D of new technologies to meet the specific therapeutic needs of patients. As an excise tax, the device tax places a large burden on smaller companies that often run on thin profit margins, making it difficult for these manufacturers to absorb the effects of the policy."

First implemented in 2013, the tax was in effect until 2015 when it was suspended in a bipartisan congressional vote. It was suspended once more in 2017. This suspension was set to expire at the end of 2019, with the law taking effect on January 1, 2020.

Supporters of the tax argue that the impact of the tax on device manufacturers is overstated, and that it is an essential source of funding for the ACA to ensure millions of Americans have access to some form of healthcare coverage.

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Harvard, MIT, GE and Fujifilm partner on $50 million biomed center

Posted online December 01, 2019 by Thomas Dworetzky

A new Massachusetts-based consortium hopes to smooth the path for cutting-edge gene therapy and cancer immunotherapy from research lab to hospital clinic.

The newly announced center will include a board of directors from Harvard University, Massachusetts Institute of Technology, Fujifilm Diosynth Biotechnologies, GE Healthcare Life Sciences, Alexandria Real Estate Equities Inc., and have contributing members from Beth Israel Deaconess Medical Center, Boston Children's Hospital, Brigham and Women's Hospital, Dana-Farber Cancer Institute and Massachusetts General Hospital, MilliporeSigma, and the Commonwealth of Massachusetts.

"This is a momentous opportunity," noted Martin Meeson, president and COO of Fujifilm Diosynth Biotechnologies, U.S. "Our participation as one of the founding members is to enable these very important therapies to be accessible to patients. We seek to bring very much needed expertise and capacity to the one of the leading biotechnology ecosystem in the world."

The $50 million Center for Advanced Biological Innovation and Manufacturing will be an independent nonprofit, and will get an official name within a year, according to a Harvard report.

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Ten former NFL players indicted for nearly $4 million in false claims

Posted online December 17, 2019 by John R. Fischer

A group of former NFL players are facing a legal match with the Justice Department over allegations of submitting false claims amounting to nearly $4 million for the use of various medical equipment.

The U.S. agency unsealed two separate indictments against 10 players, accusing them of submitting and collecting more than $3.9 million in false claims to the Gene Upshaw NFL Player Health Reimbursement Account Plan, a private insurance plan established as part of a 2006 collective bargaining agreement between team owners and players. The two separate indictments concern two alleged conspiracies involving different players related to the same fraud scheme.

"Ten former NFL players allegedly committed a brazen, multi-million-dollar fraud on a health care plan meant to help their former teammates and other retired players pay legitimate, out-of-pocket medical expenses," said assistant attorney general Brian Benczkowski for the Criminal Division of the U.S. Department of Justice in a statement. "Today's indictments underscore that whoever you are, if you loot healthcare programs to line your own pockets, you will be held accountable by the Department of Justice."

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Fujifilm in talks to acquire Hitachi's medical imaging business

Posted online December 17, 2019 by John R. Fischer

Fujifilm plans to acquire Hitachi's medical imaging business in hopes of competing with larger global rivals in the space, according to a Tuesday report in Nikkei Asian Review.

The purchase of the division could run just north of $1.55 billion, estimates the Review, and is expected to place Fujifilm on equal footing with global medical imaging players such as Siemens, General Electric and Philips.

Word of the agreement was first reported by Reuters, which described it as in consideration and noted that "a Fujifilm spokeswoman, speaking after the Nikkei business daily first reported the plan, said it is true that the company is considering the acquisition, and the company will make a disclosure when decided."

Completion of the deal would oversee the transfer of Hitachi's portfolio of CT, MR, and ultrasound gear. Both firms are set to have board meetings Wednesday to discuss the matter and where votes on the acquisition are anticipated.

The integration of the Hitachi division, which holds a 5.5 percent stake in the medical imaging sector, with Fujifilm, which holds 2.9 percent, would boost the latter close to Canon, which holds the number four spot in the sector. At present, GE, Siemens and Philips dominate the medical imaging world with a combined share of 65 percent, according to market research firm Evaluate, noted the Review.

The timing of the deal also falls in line with moves by Fujifilm to build its medical equipment business — notably in endoscopy and X-ray imaging. Earlier this month the company made public its intention to buy 25 percent of Fuji-Xerox-owned by Xero U.S. It plans to transform the entity into a subsidiary with a goal of developing a new imaging product designed out of a combination of both companies' technologies, reported CNBC.

"Fujifilm and Xerox have fostered an exceptional partnership through our existing Fuji Xerox joint venture, and this transaction is a strategic evolution of our alliance," said Shigetaka Komori, chairman and chief executive officer of Fujifilm, in a statement at the time.

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Total US healthcare costs hit $3.6 trillion in 2018

Posted online December 31, 2019 by Thomas Dworetzky

Total national healthcare spending in 2018 grew 4.6 percent — slower than the overall GDP growth of 5.4 percent for the same period, said a new report by the CMS Office of the Actuary.

The study appeared online in the journal Health Affairs.

"Spending has to slow down when it gets so big," Paul Hughes-Cromwick, the co-director of sustainable health spending strategies at the research group Altarum, told The New York Times. "There's no question that there are efforts all across the environment to try to control this beast. There's no question about that, and some of them are working."

The slowing had the effect of cutting the overall share of the economy for healthcare spending from 17.9 percent in 2017 to 17.7 percent in 2018. Total national healthcare costs hit $3.6 trillion in 2018, which translates to $11,172 per person.

Hospitals accounted for the biggest part of healthcare spending — $1.2 trillion, or 33 percent of the total spend in 2018, according to the report. Medicare spending was 21 percent of total healthcare — up 6.4 percent in 2018.

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Audit of VA uncovers over 100,000 canceled and delayed imaging orders

Posted online December 12, 2019 by John R. Fischer

An audit carried out by the inspector general for Veteran Affairs has uncovered more than 100,000 diagnostic imaging orders that were improperly canceled or delayed by VA employees.

An estimated 106,000 requests for radiology and nuclear imaging exams were canceled between September and December 2017, with decisions stemming from scan backlogs, breakdowns and mismanagement at every level of the agency, according to the auditors.

"This Office of Inspector General report focuses on events that date to more than two years ago," said the VA in a statement to HCB News. "VHA concurs with all of the OIG's recommendations and is executing improvements to the radiology and nuclear medicine exam request process."

The auditors looked at backlogs and cancellations at nine VA facilities and contacted staff at about 40 in Iowa City, Tampa, Cleveland, Las Vegas, Los Angeles, Dallas; Salisbury, North Carolina; Aurora, Colorado; and Bay Pines, Florida.

Though no veterans were reported harmed, the report concluded that as many as 115,000 exams out of 660,000 had not been completed on time.

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ViewRay teams with Elekta and Medtronic on MR-guided radiation therapy

Posted online December 13, 2019 by Thomas Dworetzky

ViewRay has inked agreements with Elekta AB and Medtronic that aim to increase understanding into and practices of MR-guided radiation therapy.

The partnerships will each include the establishment of clinical studies to assess the impact and benefits provided by the treatment, as well as probes into additional therapeutic areas in which the technology could prove beneficial.

"We are pleased to announce these important collaborations and investments in ViewRay," said ViewRay's president and CEO Scott Drake in a statement. "Our goal is to concurrently prove the value of MR-guided radiation therapy and strengthen our balance sheet."

The agreement with Elekta will involve the use of both companies' MR-guided linear accelerator technologies, and includes other initiatives, such as the formation of a cooperative group to focus on initiatives that could include efforts to affect healthcare policy.

Elekta will also invest in ViewRay, taking on a minority interest with the potential to rise to 9.9 percent.

"Elekta believes that competition is crucial to drive the adoption of any new technology, and that is why we are committed to continuing to develop and offer customers our high-field Elekta Unity and promoting this technology to benefit patients worldwide," said Elekta's president and CEO Richard Hausmann in a statement.

The deal between Medtronic and ViewRay is a similar clinical collaboration, that will make use of the MRIdian MR-guided radiation therapy system in studies. Medtronic has also committed to investing in a minority share of ViewRay as part of the deal.

"We are well-positioned to drive MRIdian to standard of care," noted Drake, adding that, "the ability to see clearly during the procedure, track tumors and soft tissues, and auto-gate the beam is integral to delivering highly precise, personalized medicine."

The agreements with Elekta and Medtronic follow a rough period for ViewRay, which was hit with an investor lawsuit in September, filed over allegedly false or misleading statements made regarding negative operational and financial issues reported in August.

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FDA says yes to first fully disposable, single-use duodenoscope

Posted online December 19, 2019 by John R. Fischer

The FDA has given the nod to Boston Scientific's EXALT Model D Single-Use Duodenoscope, the first fully disposable, single-use duodenoscope to be cleared for sale in the U.S.

The solution enables visualization and access to the upper gastrointestinal tract to treat issues such as bile duct disorders, and is designed for use on a single individual, a feature that is expected to eliminate the spread of disease from individual to individual.

"Unlike duodenoscopes that are used on multiple patients, a fully disposable duodenoscope doesn't need to be reprocessed, eliminating the risk of potential infection due to ineffective reprocessing," said Jeff Shuren, director of the FDA's Center for Devices and Radiological Health, in a statement. "Improving the safety of duodenoscopes is a top priority for the FDA since such devices remain critical to lifesaving care for many patients, and the FDA continues to encourage innovative ways to improve the safety and effectiveness of these devices."

The clearance of the EXALT Model D Single-Use Duodenoscope follows that of duodenoscopes designed with disposable end cap and elevator components.

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Dedalus in talks to buy piece of Agfa's IT business

Posted online December 03, 2019 by Thomas Dworetzky

Agfa-Gevaert Group has announced that it is now in exclusive negotiations with Dedalus Holding to sell part of its healthcare IT business to the Italian company.

The deal represented a step in the transformation of Agfa-Gevaert Group, first announced by its board in May.

Under consideration is the sale of its Healthcare Information Solutions and Integrated Care activities, as well as its Imaging IT activities that are "tightly integrated" into these activities, which is the case mainly in the DACH region (Germany, Austria, Switzerland), France, and Brazil.

"The expected sale of the business, which generates around 260 million Euro of full-year revenues, will represent another milestone in our transformation process," Christian Reinaudo, CEO of the Agfa-Gevaert Group, said in a statement. The deal would have Dedalus take 100 percent of the business at a value of 975 million Euros.

The deal, if it happens, is expected to close during the second quarter of 2020.

Dedalus specializes in diagnostic and clinical management solutions, GP and primary care management, interoperability and population health management.

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Scan misinterpretation biggest cause of patient injury in diagnostic radiology

Posted online December 16, 2019 by John R. Fischer

Misinterpreting a diagnostic scan is the number one cause of patient injury, according to a new study conducted by physician-owned medical malpractice insurer The Doctors Company.

Evaluating closed malpractice claims in both diagnostic and interventional radiology, the company found injuries took place the most in exams where misinterpretations occurred, which took place in 78 percent of cases — especially ones involving CT. It also looked at interventional radiology, where patient injuries occurred mostly due to technical performance.

"Since the CT scan has become so ubiquitous and widely available, it has evolved into an essential tool in many imaging-based diagnoses," Dr. Bradley Delman, vice chair for quality in radiology in the Mount Sinai Health System told HCB News. "With recent advances in resolution and imaging quality, a single CT exam often contains many hundreds of images. A subtle finding among such a large data set may be harder to detect overall. In addition, unlike the MR that may be used to refine a specific diagnosis, CT has become much more of a screening tool than it had been in the past."

Delman reviewed the study for The Doctors Company along with other physician experts to form an accurate and unbiased understanding of what led to patient injuries. The most common type of misinterpretation was undiagnosed malignancy. CT scans were performed in 34 percent of the 78 percent of cases where injury was caused by scan misinterpretation.

For interventional radiology, technical performance was responsible for patient injuries in 76 percent of cases, most of which involved patients experiencing poor outcomes following invasive procedures. Technical performance led to negative results in 65 percent of cases where the correct procedure was performed appropriately, while only 11 percent of claims were due to poor technique or incorrect body site.

Darrell Ranum, JD, CPHRM, vice president of the department of patient safety and risk management at The Doctors Company, chalks injuries in cases where procedures were appropriately executed up to risks of the operation.

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Canon moves Virtual Imaging X-ray business to Canon Medical

Posted online December 16, 2019 by John R. Fischer

Canon U.S.A. Inc. is once again repositioning its global medical strategy — this time by transferring the X-ray business of its subsidiary Virtual Imaging to Canon Medical Systems USA.

The move is set to take place on January 1, 2020 and expected to boost company growth by offering customers more of a "one-stop-shop" experience for access to technology advancements, to purchase equipment, and for service and applications support.

"This strategic move offers customers Canon Medical Systems USA's world-class and unified experience for equipment purchases, service and education solutions," Toshio Takiguchi, senior managing executive officer at Canon Inc. and president and CEO of Canon Medical Systems, said in a statement.

The realignment will add the digital radiographic and mobile offerings to Canon Medical Systems USA's current X-ray portfolio of fluoroscopic systems — expanding its present product line.

The company will also be transferring its eye care business operations to Canon Medical Systems USA.

In 2016 Canon made headlines when it won a bidding war for the medical unit of Toshiba, beating our Fujifilm for the deal and paying over $6 billion.

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IBA sells part of dosimetry business for over $14 million

Posted online December 19, 2019 by John R. Fischer

IBA (Ion Beam Applications S.A.) has sold a part of its dosimetry division to IZI Medical Products, a manufacturer of devices used in interventional radiology and oncology, for a cost of $14-$16 million.

The agreement transfers the ownership of RadioMed Corporation, a company acquired by IBA in 2003 that oversees the VISICOIL fiducial markers business of IBA's dosimetry division, to IZI Medical. RadioMed produces VISICOIL, an implantable fiducial marker that provides soft tissue tumor localization to enhance the accuracy of radiation therapy planning and delivery.

"The sale is part of IBA's wider strategic review of its dosimetry business," Thomas Ralet, head of corporate communication at IBA, told HCB News. "After extensive analysis the Board made the strategic decision to retain the core of the dosimetry business whilst selling the non-core part to IZI Medical Products. We believe IZI Medical Products' leading expertise in interventional radiology and oncology makes it a suitable company to drive further market penetration and development of this reliable and high-quality solution for tumor identification."

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Upcoming Events

ACE Summit and Reverse Expo

Location: Westin Peachtree Plaza, Atlanta, GA
Dates: February 17-19
Years in Existence: 7
Average attendance: 600-700
Who should attend: Executives from Hospital and Health System Architecture, Capital Equipment, Construction, Design, Engineers, Facilities Management, Specifiers.

European Society of Radiology

Location: Austria Center Vienna, Vienna, Austria
Dates: March 11 - 15
Years in Existence: 52
Average attendance: 25,000+
Who should attend: Radiologists, radiographers, surgeons, oncologists, technologists.

Health Connect Partners – Spring Conferences

Location: Hyatt Regency New Orleans, New Orleans, LA
Dates: March 16 - 20
Years in Existence: 14
Who should attend: Hospital & Healthcare IT, Radiology, Imaging vendors, OR & Surgical and Supply Chain vendors looking to meet with industry decision makers in a Reverse Expo setting.

SIR 2020: Society of Interventional Radiology Annual Scientific Meeting

Location: Washington State Convention Center, Seattle, Wash.
Dates: March 28 - April 2
Years in Existence: 45
Average attendance: 5,200
Who should attend: Interventional radiology physicians, fellows, trainees and related health care professionals, such as physician assistants, nurse practitioners, radiology technicians, radiology and imaging nurses, and other physician specialists interested in interventional treatments.

World Health Care Congress

Location: Washington Marriott Wardman Park, Washington, D.C.
Dates: March 29 - April 1
Years in existence: 17
Average attendance: 1200
Who should attend: Health Plans, Hospitals, Health Systems, Provider Groups, Government, Employers, Pharma, Biotech, Medical Device, Health IT Health, Investors, and more.

OU Medical Center

Location: Oklahoma City
Year founded: 1910 (originally as Wesley Hospital, and current hospital opened in 1974)
Number of beds: Currently 364 — will be 508 with new tower
Number of employees: 2,673
President: Kris Gose, RN, MBA, president, OU Medical Center

Specialties: Cancer, Trauma, Neurosciences, Diabetes, Ophthalmology, Transplant

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1. *Lobby entry*
2. *Patient Waiting*
3. *Patient Room*
4. *Patient Corridor*

Recent developments: Feb 2018 transition from a large national parent company to a free-standing, locally owned not-for-profit health system. Health system is OU Medicine — OU College of Medicine, all other Health Colleges, Harold Hamm Diabetes Center, OMRF, Dean McGee Eye Institute, OU Medical Center, The Children's Hospital, OU Medical Center Edmond, Surgery Center, OU Physicians, Stephenson Cancer Center, OUMC Clinics. Topped out a 450,000, nine-story, 32 OR, 144-bed, community logistics center and educational center, state-of-the-art, patient and family-friendly healthcare addition to save more Oklahoman lives and improve the health of our state.


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Q&A with Kris Gose

president of OU Medical Center

Opening a new patient tower in Oklahoma City

By Sean Ruck

Oklahoma's OU Medical Center is bucking the trends seen elsewhere in the country of decentralization of larger hospitals and consolidation of smaller facilities. The organization became a free-standing system just two years ago and is also getting set to open a new patient tower this year, but the project was first discussed more than a decade ago. While it's been some time in the making, that was a positive, as it gave an opportunity for deep assessment of needs and ultimately led to a more innovative building that is set to better serve both patients and healthcare team members. OU Medical Center president, Kris Gose, played a big role in the reassessment and the tower has been a major focus for her. HealthCare Business News spoke with her to find out more.

HCB News: How long have you been with OU Medical Center?

Kris Gose: I've been on this campus since 1995. I've been in my current role since 2013.

HCB News: What drew you to a career in healthcare?

KG: I really wanted to be a leader in changing the way healthcare is delivered and improve that to make a difference. I started as a pediatric nurse, so at the beginning, it was one patient family at a time. I moved into leadership, which was always my goal, but starting with the clinical side allowed me to better understand and facilitate care because as you lead, you try to help facilitate others to improve care. So, today I hope I affect many at a time through the individuals I work with and lead.

HCB News: The groundbreaking for the new tower was in November 2017, but when did discussion for the building start in earnest?

KG: I was chief nursing officer for the system in 2007 when the first conversations occurred. The first time I was involved in discussions regarding the proposal of building the tower was 2009. That had variations of the proposals over time, which had made it through different approval processes with our past parent company. But in February of 2018, we transitioned away from our parent company and became a locally-owned, free-standing, not-for-profit health system. As we went through that journey, it was decided that we would be moving forward with the patient tower that had been put on hold. So we got back to work, and at that time, we got to redesign the building. Up to that point, it had been sort of a square box. We sat back down with the architects and we had a lot of fun. We decided to have the design of the building reflect the innovative healthcare we planned on delivering to the public. It looks a lot different than a square box today, as I'm sure you can see.

HCB News: Many hospitals are trending toward smaller satellite buildings to offer services, what made this a better option?

KG: We are a rural state with a population centralized in several primary cities. Beyond that, however, it's small communities that struggle with resources. We have seen hospitals shut doors and those communities have reached out to us to figure out how to deliver care across the state in the most effective ways.

We are the state's only Level 1 trauma center and that unique status, along with the subspecialties and specialties we offer, created the need to build inpatient capacity here. As an organization, OU Medicine is looking at many different pieces. We have part ownership of a post-acute rehab facility and we continue to look at post-acute opportunities to ensure patients aren't staying in the highest-cost delivery settings to achieve their healthcare goals. We're looking at primary care, urgent care centers, and telemedicine. We're continuing to look at things you see on the national trends, but we have this demand as well as the academic tertiary/quaternary system in the state.

Maybe it's also, in part, because we didn't build as much during the time that others did. Today, we're over 100 percent occupancy every day. So some of the growth we had built into the business case of the patient tower we actually achieved in the current patient tower. We did this by creating unique settings for patients, creating new processes and making sure we had enough resources to bridge the time period until the new patient tower became available.

HCB News: Does the expansion also bring an expansion to any services or specialties offered?

KG: We have started geriatric and palliative care programs, and the new space will enable us to really expand the capabilities. We are beginning to develop a burn program. We didn't have the room to do that in our ICU. Over the last year, we achieved NCI designation. One of the strengths in our services is our cancer program, which includes the only bone marrow transplant unit in the state. This new growth will allow us to expand our bone marrow transplant unit significantly to meet the needs and demands for the state. It will also allow us to include a surgical oncology floor, a medical liquid tumor floor and other services, so we're going to be able to truly specialize our inpatient care to match our cancer center delivery.

Currently, we have one OR setting, so our elective cases are done in one location — the same location our Trauma Center utilizes. Our team does a phenomenal job, but it's a challenge to deliver elective care and emergent care at the same location.

In the new facility, trauma will stay primarily in the current patient tower, so we can deliver trauma and emergent care all in that setting. And then we will have an entire separate new OR floor for scheduled and elective surgery, which will allow us to deliver more timely and efficient surgical care.

In the last couple of years, we built a new cardiac cath lab. The new patient tower will hold the prep and recovery to that unit. We will have an entire Cardiovascular Institute floor in the new patient tower. All the rooms in the new patient tower are set up to be acuity flexible. On the Cardiovascular Institute floor, we're actually going to do some research on keeping the patient in the room and bringing the different levels of care to the patient. So if they come in as an ICU patient, they will have intensivists and ICU nurses seeing them, but as they get better and step down their medical status, they will stay in the room and we will bring their providers to them. There are thoughts that this will decrease the length of stay and improve communication among stakeholders to improve patient satisfaction. We're collecting data now about this population and we will deliver care in the new method and see if we impact those areas. If we don't, that won't be the healthcare delivery future for us. But if we do, we'll have found something positive, and being an academic healthcare facility with an important piece of our mission to look for innovative solutions, we'll be fulfilling that role.

HCB News: With your background as a pediatric nurse, when it came time to design the new tower, were there things you were able to suggest that would make it easier for the staff having daily interaction with patients?

KG: It's something I've been incredibly passionate about for a long time. Part of that rationale and reason are basically because of what your question touched on. Obviously the architects and all the other team members had input and their fingerprints on the project, but I'd like to think I had impact from being a pediatric nurse, being a face in front of patients and family. You'll see all our rooms are over 300 square feet and they're divided into a healthcare team, patient area and family area. In our current space, we get a lot of feedback from family members that when the academic healthcare team comes into the room, families don't feel like they have anywhere to be. They feel like they aren't supposed to be there because we crowd them out. So the goal was to create a space that would be very friendly and supportive of their presence regardless of the resources coming into the room. On top of that, you'll see from the exterior that all the patient rooms are on the outside-facing walls with windows going floor to ceiling to provide plenty of natural light and a healing environment

We also had surprising feedback regarding even things like door choices. We thought patients would prefer full steel doors. As we talked to patients though, they said that was actually scary to them. They wanted for us, the healthcare team members, to be able to see them, but also wanted to have the ability to shut that view off if they needed to. So we have blinds built into the windows in the doors.

Conference rooms will be located on the first floor to help us communicate as teams. Being an academic medical center, the planning for that area was actually driven by what I think is the big connection to our community. As a Level 1 trauma center, we take our responsibility in disaster preparedness and treatment very seriously. Our community comes to us when tornados hit, or any other disaster. So, those educational conference rooms all have walls that go up, allowing us to provide a space for hundreds of people in the case that we ever experience a large disaster. We can convene, communicate and coordinate disaster response in this area.

HCB News: Will the staffing for the new tower be from existing staff or new hires?

KG: We have significant recruitment plans already initiated and have hired additional recruiters. We already hired some perioperative staff before Christmas so they can be appropriately trained before we open. There will be a cascade of new staff — ICU nurses have to be hired by spring, medical surgical by summer, housekeeping by August. We're not planning for every piece of the new facility to be 100 percent staffed on day one, but we're looking for 100 to 200 new hires initially, and when the facility is complete and fully staffed, it will take somewhere between 400 and 500 additional new full-time employees.

HCB News: How do you think healthcare will or should change over the next five to 10 years to make it sustainable?

KG: I think healthcare cannot stand alone in different aspects of delivery of care. We have to join together to create that continuum for two reasons. The first is that it increases the quality of care for patients because it forces communications between providers that sometimes is otherwise siloed. Separately, at least in Oklahoma, not from the delivery side, but resource side, Medicaid expansion is something that's necessary. The second is because it's cost-effective; it maximizes utilization of resources.

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Bringing out the leadership skills in clinicians

By Sean Ruck

HealthCare Business News spoke with three leaders at Hartford HealthCare (HHC): Rocco Orlando, M.D., chief academic officer; Clara Riley, director of organization development, and Catie Santarsiero, APRN, director of provider health and wellness, about HHC's physician leadership training program.

About a decade ago, it became apparent that medical school and residency training weren't preparing physicians sufficiently to work in complex organizations. "We were getting great clinicians, but not necessarily folks who understood organizational structure or organizational change and how to use it to improve care," says Orlando.


Clara Riley


Dr. Rocco Orlando III


Catie Santarsiero

At Hartford HealthCare, addressing this challenge started with making sure the right people were "at the table" to candidly address concerns and arrive at consensus. That led to recognizing the pain points for different people impacted by an issue.

The ultimate goal, always, must be for all parties to ensure that decisions will provide the best experience and outcome for patients. Training helps create that bridge. To that end, the Provider Leadership Development Institute was started 10 years ago.

Here's how it works:

"We hold one full-day in class session on the first Wednesday of every month for nine months. In between, there's project work. Providers are working on a very specific project that relates to our highest strategic goals in the organization. They're working with a team and getting exposure in areas they otherwise might not have had contact with," Santarsiero said. "They're also getting the chance to use the skills, techniques, leadership competencies or knowledge shared from previous months so that they can practice it and give feedback to say what worked or didn't work."

The program is firmly rooted in HHC's culture, called "H3W", How Hartford Healthcare Works, driven by 10 leadership behaviors. These include: "be in the moment," "be curious rather than judgmental" and "have courageous conversations."

Each month, the course starts with a senior leader focusing on the H3W leadership behaviors and asking participants to explain how they utilize those behaviors to engage their own team, create a safe culture and space, or empower their team to talk with their superiors, peers and subordinates.

One of the H3W components is to "be authentic and humanistic," and Riley explains that this helps physicians understand the impact they have on others.

"We talk a lot in the program about understanding impact versus intent. That's probably not something physicians learned in school or even in their own practices, but it's a different way of thinking about how they act with individuals, whether peers or patients — how they're coming across and how they're being perceived."

Training covers a wide spectrum, and the presenters' specialties are diverse. For instance, Health IT is an important component.

"We bring that in through an innovation segment we offer," says Orlando. "Our chief of clinical innovations also has a strong background in informatics. He brings that more as an example of case-based learning. In our organization, Health IT is not a silo, it's part and parcel of the overall healthcare delivery system. When you think of what the future is, we have AI, big data — everything uses data to drive our decision-making and improve it."

It took a great deal of fine-tuning to get the program to where it is today. In the program's early days, participants would be asked to identify a problem and tackle it. Just the work needed to identify the problem would eat up a lot of time — and these are high-level people with full-time positions.

"Now, participants receive a preselected project in need of a solution and they're working on it with the resources they need to be successful," said Orlando. "In year three of doing that, the shift has been very effective."

The training is also a draw for new hires, according to Riley, who said that during the recruitment process more and more physicians are asking what HHC does for leadership development.

A unique side benefit to the program is that many of the skills covered in the training can be adapted to personal life as well. The group laughed when the question arose, but agreed that a number of clinicians had told them how lessons learned have helped them strengthen relationships with their significant others.

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Radiology's reimbursement rub

By Sean Ruck

Richard Fleury

Dr. John Carrino

HealthCare Business News spoke with Richard Fleury, vice president of the Department of Radiology and Imaging and Dr. John Carrino, vice chairman of Radiology and Imaging for Hospital for Special Surgery (HSS) about how radiologists can position themselves for success in a changing reimbursement climate.

At the beginning of our talk, we discussed the difference between volume-based models and fee-for-service. "I don't think they're completely synonymous. You can have a couple of different categories. One category could be fee-for-service but no link to value and quality, meaning the incentives are volume driven. Another category would be fee-for-service with some link to value and quality. You can have alternative payment models built on some type of fee-for-service architecture and another category where you have population-based payments," says Carrino.

To succeed in the value-based world, Carrino and Fleury feel it's imperative that radiologists interact more with their referring providers. This, in part, means discussions about appropriate utilization and providing a mechanism for that utilization through an order entry or ordering system.

The drive to improve the visibility, and by extension, support the value of radiologists is reflected in the ACR's Imaging 3.0 initiative. The initiative seeks to not only get radiologists a place at the table when it comes to deciding which tools and processes will be used going forward, but strives to show they should be a driving force in those decisions.

HSS has encouraged and supported increased visibility of radiologists and their interaction with their referring physicians for a long time, according to Fleury. The interaction goes beyond the calls or messaging to discuss findings. "It's interacting with them in their interdisciplinary conferences and participating in those conferences as a member of the team. Those engagements help foster a better understanding of the enormous amount of value of radiology in general," he says.

For now, engagement in professional societies and committees is how radiologists will best be able to tout the value of the field, as well as where they'll hone their skills in expressing the value. According to Fleury, that may change some day. "What I've heard out there, is that radiology leadership is trying to get the message across to the radiologists to have them start engaging medical students earlier in their training. Engage medical students with the importance that radiology brings to the table early and in that way, they'll demand that or see that value as they get into their medical careers. That will ultimately improve patient care."

Teleradiology also has its part in the discussion. Although it's not known for face-to-face interactions, there are still the periodic multidisciplinary conferences and increasing opportunities for virtual collaboration — PACS-supported Skype conferencing for instance.

One aspect of value messaging radiologists have little control over is the reimbursement model. Obviously organizations like ACR and AHRA can help steer some legislative discussions, but they're pulling on the tiller of a cruise ship. For HSS, a specialty hospital focused on orthopedics, rheumatology and musculoskeletal disease, that's unfortunate according to Fleury. That's because a lot of the quality measures the Medicare Access and CHIP Reauthorization Act (MACRA) introduced, and tweaks that were made to the Merit Based Incentive Payments System (MIPS), weren't applicable to HSS' focuses.

"I can't speak for other groups, but I would think they're also using similar terms like 'surrogates to quality' because we're all trying to do things like reduce dose to patients and infection rates in procedure-based services," he said. "But really, your true quality outcome measures are not being captured, I think because a lot of people are having a hard time defining them. You may be collecting smoking status on patients and infection control best-practices for patients, and striving to reduce radiation dose as much as possible, but in the end, does it really deliver better quality of care?"

Carrino believes physicians need a bigger voice in explaining what defines healthcare quality. But at the same time, as those discussions occur, if people want higher quality, the value to cost equation will tilt further.

As patients pair their growing savvy at navigating the internet with an increasing understanding about their own health care, they'll ultimately make the decision for transparency related to value and cost. Before that time comes, Fleury says it's important to be very clear on the value side or benefit side of those costs. "So in that way, the patients can get the full story — they may be paying more for services. Are they getting more? Are they getting better quality? Organizations are really going to have to have that message down very well."

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Get more value from your medical equipment budget

By Al Gresch

With healthcare margins under constant pressure, and expense rates growing faster than revenue, hospitals are eager to save some of their $93 billion annual spending on medical equipment. According to some estimates, potential cost savings of between 12 and 16 percent can be missed due to a lack of accurate information, internal resources, bandwidth, and specialized expertise.

I've spent my career developing strategies for HTM organizations to move from basic preventive maintenance/break-fix operations to proactive, best-in-class programs. When asked what to do first, I typically recommend the following actions to improve efficiency, save cost, enhance compliance, and improve patient care.

Establish structural data integrity

That means developing a consistent methodology for equipment, regardless of department or location. Then, define the "transforms" that map vernacular terms used by staff into specific standards and precise terms you've defined for equipment type, manufacturer, and model. For example, when a nurse requests a new "infusion brain", your system should deconstruct that into the accurate terms for category (i.e., pump), type (i.e., infusion), manufacturer, and model.

Then, match your electronic records with what's actually in place. A physical inventory audit might be necessary. Also, be sure your standardized HTM codes are populated into your Computerized Maintenance Management System (CMMS). This enables benchmarking of what service staff is doing so analytics can identify efficiency opportunities.

Centralize and standardize policies and procedures

The next wave of value comes from getting everyone to use the system the same way. Stakeholders from across the organization should be brought into the creation process, to ensure their needs are met. Then, document the standards and provide training. Be sure to address how permissions are granted for system access, and how security is maintained by tier, role, and individual.

Control costs by defining how equipment or service requests can be made, and how those requests are routed. Establish closed-loop visibility so stakeholders know the status of orders and requests.

Manage parts and supplies inventories

Make sure parts and supplies spending are included in the data standardization so that your system can track usage and inventory across the organization, revealing consolidation opportunities.

Next, centralize parts procurement. Hire or deploy existing staff solely for HTM parts and supplies, or partner with an outside entity that specializes in it.

The group can institute quality ratings for the parts and vendors provided to them. Monitoring dead-on-arrival rates, late deliveries, and wrong part deliveries will help weed out bad apples that cause rework, downtime, and degraded patient care.

Track and rationalize third-party services

Waste in HTM also comes from inefficient use of contractors. Decentralized decisions can create a proliferation of companies providing warranty, extended warranty, and non-warranty service. If these aren't tracked, technicians often won't know if devices are under contract, and needlessly expend time and money on procedures already covered. An automated contract management system can flag equipment under contract, provide alerts of contract expirations, and can track contractor performance against committed service levels.

Measure what matters

Measurement of Key Performance Indicators (KPIs) helps save cost over time. Measure and report HTM customer service in terms of response times, turnaround times, and equipment uptime. Efficiency metrics should include clinical utilization, code compliance, life cycle maintenance costs, equipment's age, and percentage of useful life. Your KPIs can align your team around what will move the needle. External KPIs help define success and show progress with your customers. Make them visible! Some organizations drive the point home with wall monitors showing real-time service metrics.

Plan capital replacement based on solid data

With data rationalized into centralized systems, you can get more mileage out of funds available for replacement equipment. Your systems can feed a capital planning tool using criteria agreed upon by all key stakeholders. Your portfolio can be evaluated on a common scoring system that includes age, service history, maintenance costs, regulatory exposure, and projected clinical and financial risks, should the equipment fail.

There's never enough capital funding to get all the HTM equipment you need. By bringing objective data to bear, a rational methodology can show what really must be replaced. Adjustments like these can get the HTM team to the decision-making table and help the capital planning and supply chain teams make better decisions.

About the author: Al Gresch is vice president of customer success for healthcare at Accruent, the world's leading provider of physical resource management solutions.

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Are you ready for a recall?

By Valerie Dimond

Paul Lambert

Crystal Geibel

Drug and medical device recalls continue to roll in at record-high numbers with little sign of letting up. In fact, medical device recalls increased more than 21 percent to 243 in the third quarter of 2019, according to Stericycle's most recent Recall Index. Software issues remain the leading cause of recalls followed by quality issues, device failures, and problems related to sterility, parts, and specs.

Implementing an effective recall management program is essential to preventing patient injury, long-term health complications and death caused by defective products, yet many health systems struggle with developing an effective strategy.

St. Luke's Health System in Boise, Idaho, used to be one of those systems. But today they have a robust program in place that has allowed them to reduce unresolved alerts by 95 percent, cut resolution time from one month to three days, and increase the percentage of recalls completed within three days from 55 percent to 98 percent. Plus, over the last year, 100 percent of all critical recalls (e.g., defibrillator failures, surgical items breaking inside patients) have been resolved within 24 hours across the entire health system.

These improvements began after a serious incident related to recalled infant formula prompted **Paul Lambert**, system director for supply chain operations, recall analyst **Crystal Geibel**, and others at St. Luke's to conduct a comprehensive review of their recall management program, identify the cracks, and seal them up with solid solutions.

"The St. Luke's Health System Internal Audit team investigated the need for a systemwide recall program," said Geibel. "Variable response practices were found throughout the health system that weren't serving our patients' need, nor systematically providing the documentation we needed for Joint Commission's Element of Performance EC.02.01.01 EP 11 requirement that we respond to all types of items, identify responsible parties, and document actions taken."

Lambert says when they realized they needed an automated, centralized program for managing recalls, they took several steps to make it happen. "We hired a competent analyst, investigated industry best practices, created the recall program model, communicated with system leadership, chose a recall software program, onboarded end-users to the recall program, defined roles in a RACI matrix, created a reporting dashboard, and produced a system recall policy," he said.

The next step was making sure employees were able to meaningfully engage with the program. "Centralization is important for standardization, including communication, response standards, and escalation, so the information can be accessed for an audit," said Geibel. "It's also important that the information from recalls is automatically shared with local employees who can take action. We use an already developed software program to coordinate the publication, assignment, and storage of alerts and their responses. We also partner with our software provider to help them continue developing the program we will need."

Gaining full support and involvement from leadership was imperative to the program's success. St. Luke's chief quality officer and program sponsor Dr. Bart Hill is fully engaged and invested in the initiative, as is the organization's chief executive officer Dr. David Pate. "For a health system of over 14,000 employees it is impressive he not only knows our program and our standards but has also had goals for us," said Geibel.

Lambert and Geibel point to purchase order spending and standardization of product acquisition as key focus areas for enhancing recall readiness. "Without full integration of purchase history, health systems must address product recalls that may not impact their facilities," Geibel explained. "Once we have full purchase history integration, we can focus on how we can assign recalls by the location that purchased the item, potentially reducing the workload by more than 85 percent.

"As supply chain professionals it's very easy to see how the opportunity in healthcare recalls is highlighting a greater need for full product integration – how we buy, how we assimilate our purchases, how we track orders, and how we document what, where and when an item is used," continued Geibel.

As healthcare systems adapt to changing reimbursement models and new patient-care initiatives, recall management programs should evolve as well. "This opportunity in healthcare will be further highlighted with increased telehealth visits, population aging, and the proactive, effective treatments that are meeting patients where they are located and are being encouraged with population health models and value-based payments," she said. "The results of our work will be highlighted as the public demand for quality transparency matures and payment for quality programs progress."

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What will AI mean for tomorrow's HTM professionals?

By Sean Ruck

Elizer Kotapuri

Sean Connolly

The downtown campus of the University of Maryland Medical System alone has close to 30,000 pieces of medical equipment. With those types of numbers, ill-advised purchasing and servicing decisions can quickly become major financial missteps. That's why **Sean Connolly**, imaging services manager, is committed to finding ways to streamline preventative maintenance to make it more predictable and efficient.

Alternative equipment maintenance (AEM) programs have emerged as a promising method for reducing equipment service expenses, maximizing equipment uptime and creating a more efficient HTM program in general. Once validated, an AEM program can work outside of suggested manufacturer maintenance recommendations in a safe, effective way. It doesn't take a lot of imagination to see how AI could bring those programs to the next level.

By allowing some smart automation, the efficacy of the AEM programs can ramp up, further reducing downtime and further reducing costs. But there's some translating that needs to be done in order for HTM to hit that point. A Columbus, Ohio-based company called Mass Techologies is busy zeroing in on equipment that can safely be purchased in higher quantities without having to worry about all the eggs going into one basket, which is a benefit. "We're looking at standardizing technologies," says **Elizer Kotapuri**, the company's chief clinical technology officer. "If I have one car and the service training costs so much, the question becomes 'is there a cost benefit in investment to support one piece of equipment?' However, if we have 20 cars, same make and model, it's an economy of scale. You standardize on technology because there is cost efficiency."

That economy of scale also means AI will be working with a more robust data set. Pulling information from 10,000 items and plugging in their maintenance details will weed out anomalies where devices far outlast their suggested maintenance, or break down earlier than they're supposed to. But getting back to Kotapuri's point, the economy of scale is only effective if the data is standardized. Taking three devices of the same make and model and entering the first as a "sports car" the second as a "red car" and the third as "standard transmission" muddies the data until either someone manually corrects or the AI evolves enough to do it on its own.

For HTM, AI is still a new frontier. Connolly says that, to his knowledge, there are not currently any specific tools available to help facilities determine if AI use is right for their organization. "That question came up during AAMI when we gave our talk, that it's the perfect opportunity for the HTM community to come together and establish standard code to use throughout the industry so our databases can learn."

That standardization, according to Connolly, would address things like preventive maintenance codes, corrective maintenance, operator error and more. "The machine would be learning from the same database," he says. "That's something we haven't done well as an HTM community. Some people have said that maybe we need to look at an AAMI or the Joint Commission to tell us what these standards are. I would have to disagree and say that we should be telling the Joint Commission and AAMI what these standards should be based on our experience of working every day with this equipment."

Ultimately, Connolly believes a well-implemented AI program catering to the HTM department could provide a return on investment in just a year. After that year, it would be almost all savings with very little, if any, investment needed.

The two believe that AI could be integrated into existing systems so use would be seamless, but training would still be needed to keep everyone entering data on the same page. Making sure everyone's using the same codes, speaking the same language to keep the AI healthy and effective and even creating effective search queries.

The caveat to this conversation is that there's not currently a lot out there for AI in HTM right now, so organizations probably shouldn't start writing checks just yet. "I'd hold off until something more standard is out there, but it really has the potential to explode in the HTM field and bring a lot of value," says Connolly.

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Selecting the right patient monitor

By Julie Andrews and James Laskaris

Physiological patient monitoring is a critical tool for measuring the health of patients and their reaction to a therapy. The basic technology has been around since the early 1950s, with systems that provide ECG waveforms, alarms, and heart rate information. Next-generation systems targeted the operating room and critical care areas by adding EEG, invasive pressures, temperatures, and ECG parameters. Starting in the 1970s, the monitoring systems added arrhythmia analysis and trending. Current-generation systems aim to provide remote monitoring, early warning for diseases, and EMR interfacing.

The U.S. market is expected to surpass $6 billion by 2023, reflecting a growth of more than 25 percent in the last seven years. Driven by new technology the monitoring market is evolving to focus on providing solutions for value-based care, improving operational effectiveness, and leveraging big data — three significant challenges for healthcare providers.

With the focus on outpatient care, only the sickest of patients are admitted to the hospital. Currently over 5 million patients are admitted to an ICU for intensive monitoring each year. As the patient population ages, this number will continue to grow. Though telemedicine is slowly gaining CPT codes and reimbursement, one challenge to patient monitoring is the lack of direct payment for the use of the technology in an inpatient setting. This can be significant, considering that an 8-bed system starts at $120K and can easily reach over $200K for an integrated system. Payback for this investment is seen in early detection and monitoring treatment, which translates to a shorter length of stay at lower cost.

Five major factors are involved in the purchase of patient monitoring: level of technology, integration ability, standardization, mobility, and cost. Various monitoring systems are stronger in some operations than others, and these factors may weigh more or less heavily depending on their importance to your facility. I recommend that you rate these factors in order of importance relative to your needs. This will help point you to a system that best fits your needs.

Choosing the right mix of patient parameters, software, and networking can be a challenge. According to the American Hospital Association the life expectancy of a patient monitor is 7 years. So, selecting a system will have long-term repercussions. Monitors range from the simplest blood pressure cuff to advanced multi-parameter screens used in the most complex of operating room scenarios. With this variety and range in options as well as pricing, how does one decide on an appropriate monitor for a specific area of care? Providers must decide how much monitoring is too much or too little and at what cost.

Selecting advanced patient parameters can be import to patient outcomes. One prime example is $EtCO_2$. Once only an OR parameter, $EtCO_2$ is now finding its way into the ICU, ED, and general medical surgical areas of care. A study in *Scientific Reports* (2019) supported using $EtCO_2$ monitoring in patients undergoing general anesthesia, which has been the norm, as well as those under procedural sedation as a way to reduce sedation-related adverse events such as delayed recovery, permanent hypoxic injury, and even death.

By using the monitor to assist in the prevention of adverse patient events, both the patient and facility benefit. The same $EtCO_2$ module can be key in preventing failure to rescue scenarios throughout the acute care and ambulatory care areas. Value-based care can be directly affected by selecting the appropriate monitoring parameters in each area of care. This one parameter can help to increase reimbursement tied to delivery of care, improve patient throughput, and most important, improve quality of patient care.

Allied healthcare professionals and acute care providers alike have myriad options available to customize the monitoring in their areas of practice. The consistent challenge is whether that monitor and associated parameters will be able to connect with the guiding facility's electronic health record (EMR). If the sharing and transfer of data stops at the door of the provider, then the value of the monitor has been greatly diminished. However, if that monitor has the capability to share the patient data within the total healthcare system, the patient care cannot only be improved but be made more efficient.

Does this mean that every procedural area, both in and out of the acute care setting, needs high-end, multi-parameter monitoring? No. The ability to customize monitoring from today's major vendors allows monitors to be designed to fit each care area and to be portable between areas. It is inefficient use of capital funds to over-purchase patient monitoring. The most cost-effective strategy is to look at the varying levels of care within a facility and purchase a monitor that can be integrated with modules to provide the level of assessment for each particular patient.

Patient monitoring can be a key tool in improving outcomes and operational effectiveness. The challenge of this technology is matching the right system to an evolving patient mix and keeping in mind that it is a decision that a hospital will have to live with for many years.

About the authors: Julie Andrews is a clinical analyst at TractManager. James Laskaris is a senior clinical sratregist at TractManager.

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People on the Move

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Q&A with Boris Brkljačić

ESR president

Building partnerships toward a unified imaging community

By Sean Ruck

ECR 2020 takes place March 11 – 15 in its traditional Vienna locale. Another tradition is an interview with the ESR president in advance of the show. This year, we spoke with ESR president, professor Boris Brkljačić from Zagreb, Croatia.

HCB News: How long have you been a member of the European Society of Radiology?

Boris Brkljačić: I have been a member of the ESR ever since it was first founded in 2005, by merging the European Congress of Radiology (ECR) and the European Association of Radiology (EAR).

HCB News: Is ESR the premier radiology organization across Europe or are there any that are as large or larger in certain countries?

BB: The ESR is not only the largest radiological society in Europe, but with more than 120,000 members from 182 countries, it's also the largest worldwide. While other societies are facing stalling growth rates, our society is still growing year by year, which is one of the big ESR success stories. The annual meeting, the European Congress of Radiology, is amongst the most innovative medical meetings, having exceeded the 30,000 participants threshold last year.

HCB News: What are the main goals you are championing as president?

BB: The most important task of an ESR president is to prepare and advance the European Congress of Radiology. Together with the members of the program planning committee, we did an excellent job for ECR 2020 and created a very comprehensive educational program of the highest quality. We had the bravery to introduce several changes that I hope will advance the quality of the congress even further. I am very grateful to my PPC and subcommittee members, as well as to the ESR Congress office staff for their great work and dedication.

A major focus for me over the last few months was furthering and intensifying our relations with other radiological and related societies. I represented the ESR at many national congresses and international meetings, where, in addition to professional talks, I presented the ESR's various activities. Also, we consolidated our cooperation with the European Cancer Organisation and took up new relations with the European Federation of Clinical Chemistry and Laboratory Medicine.

Radiation protection is certainly something that deserves our enhanced attention, and to this end, I have strongly supported the activities of ESR's EuroSafe Imaging campaign. In particular, supporting activities in Eastern Europe as well as the dissemination of ESR's imaging referral guidelines embedded in a clinical decision support solution, ESR iGuide.

I also fully recognise the importance for the ESR to be acknowledged as a major stakeholder in EU health policies and involved in consultation processes for new legislative initiatives in this field. Getting our voice heard in the interest of our patients is crucial, and this is why I also strongly engaged in advocacy activities in Brussels, including a recent event at the European Parliament co-organised by the ESR and the European Respiratory Society to raise awareness of lung cancer and the need for increased visibility of the disease in EU policies, particularly when it comes to screening programs.

I also participated at "The Digital Transformation of Healthcare in Europe: Unlocking the Potential of Digital Solutions for Patients, Healthcare Providers and Health Systems" event in Brussels in December 2019 to strengthen the position of medical imaging on the European Union health policy agenda, highlighting the contribution of radiology toward accurate diagnosis and treatment.

HCB News: Are there any developments within the field of radiology over the last 12 months that you're particularly excited about?

BB: Artificial intelligence and its benefits for our field has been a topic that was very much in the ESR's focus during the last year, and culminated in the publication of an ESR white paper called "What the radiologist should know about artificial intelligence" in last April.

In the same month, we hosted a very successful event in Barcelona together with the European School of Radiology called "Intelligence. Innovation. Imaging — The Perfect Vision of AI", which saw a record number of 5,800 registrations from 140 countries for live streaming and was highly praised by the ESR members.

Due to the great feedback and huge demand, we have decided to host a similar

event in Vienna in May 2020. This will again be in cooperation with ESOR and will focus on the very interesting topic of AI in oncologic imaging. This event will again be available via live stream, so I would like to invite all our colleagues from the USA to join as well.

Later in 2019 the ESR and major North American radiology organizations published a statement on ethics of AI in radiology to guide the development of AI in radiology. The multi-society statement focuses on three major areas: data, algorithms and practice. With all the positive impacts that come with the fast development of AI tools in radiology, it also puts the spotlight on complex ethical and societal questions for patients and the radiology community. It is important for professional societies like the ESR to provide guidance in this rapidly advancing field and to support the development of good practice recommendations, to provide education and training in data science, as well as to support the development of clinically relevant AI use cases and the clinical validation of algorithms. Additionally, standardization and harmonization are crucial topics at the heart of the ESR, and it is considered essential to enter into dialogue with the European institution as well as other stakeholders.

children and their healthcare issues in the spotlight. Additionally, for the third year in a row, the Cube will present Interventional Radiology in a novel and very exciting way, never seen before at any other meeting.

As every year, the opening ceremony will be the centerpiece of the congress, in 2020 accompanied by a closing ceremony called "Grand Finale" on Sunday, which will feature a colorful fusion of inspirational talks, musical performances and visual spectacles with plenty of surprises along the way. The highlights of the session will come from three extraordinary young speakers sharing their thought-provoking personal stories.

Last but definitely not least, I am very proud to announce that we will welcome three extraordinary plenary speakers at ECR. Namely Ralph Weissleder, James Thrall Professor of Radiology and professor of Systems Biology at Harvard Medical School (HMS), Bernd Montag, CEO of Siemens Healthineers and Nenad Sestan who is the professor of Neuroscience, Genetics, Psychiatry and Comparative Medicine at Yale University, and executive director of the Yale Genome Editing Center.

The annual ECR meeting is amongst the most innovative medical meetings, having exceeded the 30,000 participants threshold last year.

HCB News: What are you most looking forward to for this year's congress?

BB: The programme offers superb educational sessions in all fields of radiology, suitable for beginners and very advanced professionals, from the basic knowledge to the new horizon sessions. With more than nine thousand abstracts for research presentations submitted, there are too many things to list. Instead, let me focus on some of the prime highlights of ECR 2020.

After last year's great success, the "In Focus" program is returning and putting

HCB News: As the majority of our readers are in the U.S., can you talk about the value of an ESR membership for an American radiologist?

BB: First of all, I would like to tell your readers that ESR membership is completely free of charge if you reside outside of Europe. Despite being free of charge, the membership still comes with an array of benefits and discounts for ESR services. Being a member guarantees you the lowest fee available for the European Congress of Radiology, while giving you access to all ESR educational offers and journals.

For instance, members also receive free access to European Radiology, Europe's flagship radiology journal with an impact factor of 3.962. In terms of educational offers, ESR members can access EURORAD, the largest peer-reviewed online teaching database of radiology, free of charge and also get a substantial discount on the annual subscription of Education on Demand, the ESR's e-learning platform, which features options to earn CME credits.

Additionally, on our latest platform, ESR Connect, which offers livestreaming of ESR events and an extensive and exclusive on-demand library, our members from the USA will also be able to secure the full membership discount.

HCB News: Can you give a prediction as to how radiology will evolve in the next decade?

BB: Artificial intelligence will hopefully be closer incorporated into the daily radiological practice. Not only in the area of image interpretation, but also in the general workflow, clinical decision support and radiation protection.

I hope that it will support radiologists efficiently in coping with work overload and will make the whole healthcare system more rational and cost-effective. Radiologists need to adapt to changes and need to change their training, by including AI, bioinformatics, data management and molecular biology. We need to evolve into the role of a diagnostician who is able to integrate multiple sources of data with the help of artificial intelligence.

Since the role of the medical internist is changing through subspecialisation, radiology may take the role of integrated diagnostics, and we, therefore, need to carefully tailor education to the needs of general practice versus subspecialty radiology.

We will probably witness the development of interventional radiology into a more defined specialty with a curriculum differing from diagnostic radiology.

We need to closely liaise with pathology and probably develop combined training programs over time. Finally, value-based medicine will have repercussions on the way radiology is practiced. Innovations in quantitative imaging and AI will have to be concentrated around value in imaging.

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ESR Society Insights

A quick look at some recent events and initiatives

The ESR raises its voice on AI and digital health in Brussels

December 2019 – The European Society of Radiology (ESR), represented by its President, Prof. Boris Brkljacic, participated in a series of successful meetings and events on the 10th of December in Brussels to strengthen the position of medical imaging on the European Union (EU) health policy agenda.

In the afternoon, the ESR participated in the event entitled "Europe's Beating Cancer Plan – Better access to cancer care in Europe?" hosted by EU40, a group of young Members of the European Parliament under the age of 40. During the Q&A session, Prof. Brkljacic intervened by highlighting the contribution of radiology towards accurate diagnosis and treatment. Furthermore, he called on the EU institutions to act and to gradually implement lung cancer screening programmes following successful clinical trials that have demonstrated their effectiveness on the overall mortality rate.

In an interview with EurActiv, Prof. Brkljacic provided the society's perspective on the digital transformation of healthcare and the uptake of Artificial Intelligence (AI) both in clinical practice and research. It was emphasised that imaging technologies were far ahead from other specialties in embracing AI, with the potential to generate rapid diagnoses as well as targeted and personalised treatments.

In the evening, Prof. Brkljacic gave a voice to the medical profession's views on digital health at the event "Digital Transformation of Healthcare - Unlocking the potential of digital solutions for patients, healthcare providers and health systems", kindly hosted by GE Healthcare and the European Brain Council (EBC). Prof. Brkljacic underlined the radiology profession's support for breakthrough innovation, which should be integrated into healthcare hand-in-hand with ethical and privacy standards, putting the patients' interests first.

Women in Radiology: Gender diversity is not a metric – it is a tool for excellence

December 2019 – A group of prominent European and North American members of the radiological community have collaborated to produce an important publication on the status of women in the field of radiology, highlighting positive developments as well as areas where greater progress is needed.

Published in European Radiology, the special report, 'Women in Radiology: Gender diversity is not a metric – it is a tool for excellence', reviews the current state of gender diversity in academic and leadership positions in radiology internationally, exploring a wide range of potential reasons for gender disparities, including the lack of role models and mentorship, unconscious bias, and generational changes in attitudes about the desirability of leadership positions. The report also offers strategies to proactively increase the representation of women in academic and leadership positions. Contributing authors to the paper include Prof. Rahel Kubik-Huch, Prof. Valérie Vilgrain, Prof. Gabriel Krestin, Prof. Maximillian Reiser, Prof. Ulrike Attenberger, Prof. Christopher Hess and Prof. Hedvig Hricak.

The publication of this special report is intended as a follow-up to the unique 'Women in Focus' programme, which was held at this year's European Congress of Radiology (ECR) in Vienna. The event, which was chaired by Prof. Hricak in coordination with the European Society of Radiology, saw a range of diverse speakers discussing issues of particular concern for women working in the medical field. It included audience participation and touched on important issues for young professionals such as leadership, mentoring, and facing challenging environments.

The European Society of Radiology welcomes healthcare push on the EU policy agenda

November 2019 – The European Society of Radiology (ESR) warmly welcomes the ambition of Commission President-elect Ursula von der Leyen, a medical doctor herself, to push forward healthcare in the EU policy agenda by appointing a Commissioner for Health with a strong mandate and increased attributions. Stella Kyriakides, a health expert and a long-standing advocate for health prevention, was nominated for the post with a clear mandate to promote public health and deepen collaboration on pressing health challenges in the European Union.

As the umbrella organisation representing the radiology profession in Europe, the ESR was pleased by the many priorities highlighted in the Health Commissioner's mission letter. Our organisation looks forward to collaborating closely on an ambitious health agenda for Europe, addressing existing and future gaps in healthcare systems. The European Society of Radiology was glad that during the European Parliament hearing, the Commissioner-designate for Health underlined crucial elements that proved an ambition for effective EU action in the field of healthcare. Indeed, Stella Kyriakides highlighted her commitment to the Medical Devices Regulation; her ambition to move the European Data Space forward acknowledging its potential for an increase in patient access to information; and the importance of a holistic approach to the European Beating Cancer Plan including prevention, diagnosis, treatment, research, survivorship and palliative care. The ESR also welcomes the emphasis of Commissioner-designate Kyriakides on Health Technology Assessments and the Cross-border healthcare directive which enable innovation as well as greater access and quality of healthcare for patients in the European Union.

DOTmed advertiser special section

ECR 2020 Exhibitors

AMST-SMIT, a Kentucky Trailer company - Expo X5, Stand 530

AMST and SMIT, Kentucky Trailer companies, are leading manufacturers of custom mobile medical imaging suites and specialty vehicles. OEM-certified in all modalities, AMST and SMIT have nearly three decades of experience designing and building North American and European MRI, PET/CT and CT units and transportables. As a subsidiary of Kentucky Trailer and Alleghany Capital, AMST and SMIT combine financial stability with experience, innovation and global reach.

AMST and SMIT's mobile medical imaging units house the latest in imaging technology, featuring better image quality, improved productivity and enhanced patient comfort. Stop by our booths to learn the benefits of our mobile medical imaging suites and specialty vehicles.

CIRS - Expo X1, Stand 140

CIRS, a Castleray company, is recognized worldwide for tissue simulation technology and as the leader in the manufacture of phantoms and simulators for radiation therapy QA and dosimetry, diagnostic imaging and quality assurance including training and demonstration phantoms for all imaging modalities.

CIRS is highlighting two NEW phantoms at ECR; the Contrast Enhanced Spectral Mammography phantom and the Multi-Energy CT phantom. The Contrast Enhanced Spectral Mammography (CESM) Phantom demonstrates the presence & absence of iodine in tissues while the Multi-Energy CT (MECT) Phantom is designed to assure accurate performance and consistency of Multi-Energy CT scans. Visit us in the Expo X1, Stand 140.

ContextVision - Expo X1, Stand 110

At ECR 2020, ContextVision introduces its latest innovation in ultrasound, RiventTM, which offers superior image quality and meets increasing demand for stronger processing capabilities. Providing immense flexibility and customization possibilities, the product can meet all user needs and image preferences.

ContextVision will also showcase AltumiraTM, its AI-based image enhancement for static and dynamic digital radiography. Altumira provides excellent and robust image quality independent of exposure variations.

ContextVision is a medical technology software company that specializes in image analysis and artificial intelligence. As the global

market leader within image enhancement, ContextVision is a software partner to leading medical imaging manufacturers worldwide

Dunlee – Expo X2, Stand 211

Dunlee, a leading provider of CT, X-ray, MR products and 3D-printed tungsten components, will showcase products for the OEM and replacement markets. Visit Dunlee to see its latest developments in CT, including the CT8000 CT tube that covers up to 16 cm in one rotation, CoolGlide liquid metal bearing technology that helps tubes cool quickly to extend tube lifetime and support high patient throughput, and the Xpert bundle, a packaged solution that combines a X-Ray Tube, generator,, detector, cooling unit and cables for fast and easy integration. In addition, Dunlee is highlighting CT X-ray tubes for the replacement market, including the Reevo 240, DA200P40 tubes and our new product development for GE scanners. The exhibit also will feature Dunlee 's expertise in 3 D printed pure tungsten anti-scatter grids.

Richardson Healthcare - Expo X5, Stand 523

Richardson Healthcare is proud to offer local support for European imaging service providers. We are a global provider of quality imaging parts and CT service training, and have expanded our availability in the Netherlands. Discover A Better Choice for replacement CT tubes, tested parts, and service training - all backed by 24/7 technical support.

ScreenPoint Medical - Expo X1, Stand 112

ScreenPoint Medical is the leading developer of AI driven image analysis technology which enables the automated reading of mammograms and digital breast tomosynthesis examinations. With proven accuracy matching that of experienced radiologists, ScreenPoint's Transpara™ system is the most advanced commercially available (CE marked for 2D and 3D mammography, FDA cleared for 2D and pending 3D), exploiting Big Data, Deep Learning and the latest advances in Artificial Intelligence to provide an evidence based multi-vendor solution. Transpara is currently being used in over 10 European countries including France, Germany and the Netherlands.

Sun Nuclear - Expo X2, Stand 203

Sun Nuclear provides innovative solutions for Radiation Therapy QA and Diagnostic Imaging QA, including CT, Mammography, and Ultrasound applications.

Featured at ECR, the Multi-Energy CT, Mercury 4.0, and Advanced Electron Density Phantoms enable comprehensive dual-energy CT imaging system testing, characterizing Automatic Exposure Control, and CT-to-electron density calibration.

Mammography compliance solutions highlighted include the Mammo FFDM™ Phantom and the Mammo 3D™ Performance Kit for Full Field Digital Mammography testing and Tomosynthesis QC compliance.

Also featured in Stand 203 are QA solutions for Ultrasound, Digital Radiography, Computed Radiography, and Fluoroscopy.

Trusted and proven Gammex™ imaging QC technologies can be found at sunnuclear.com.

Varex Imaging - Expo X2, Stand 223

At Varex Imaging, we aren't just a supplier to our customers. We aim to be an extension of their teams; a partner in their success; a solution to their problem. Our goal is to help our customers become world-class system suppliers by strengthening their competitiveness and enabling them to bring products to market faster. Our rich history spans 65+ years of dedication to the imaging industry. Our knowledge, our people, and our innovation make us who we are. At Varex Imaging, we are Solutions in Sight®.

Volpara Solutions - Expo X1, Stand 108

Volpara Solutions Features AI-Powered Cancer Screening Platform at ECR.

Volpara Solutions has joined with MRS Systems and ScreenPoint Medical to provide radiologists the clinical decision support and practice management tools they need to detect cancer earlier.

Clinical Decision Support. The newly redesigned Volpara® Scorecard+™ provides radiologists with easy access to three key patient risk insights: breast density assessment, an indication of suspicious findings in the mammogram, and lifetime risk of developing breast cancer. With accurate, actionable information about each patient available right from their workstation, radiologists can make an informed and timely decision about the patient's need for supplemental imaging and/or genetic testing as part of a personalized breast care plan.

Practice Management. Together, Aspen Breast and Volpara® Enterprise™ software provide patient, workflow, and image-quality analytics to help managers improve quality and maximize resource utilization.

Ziehm Imaging - Expo X4, Stand 404

Founded in 1972, Ziehm Imaging has stood for the development, manufacturing and worldwide marketing of mobile X-ray-based imaging solutions for more than 45 years. The company is the recognized innovation leader in the mobile C-arm industry and a market leader in Germany and other European countries.

At this year's ECR, Ziehm Imaging showcases its broad and versatile portfolio of mobile C-arms – from mini C-arms to mobile hybrid suites.

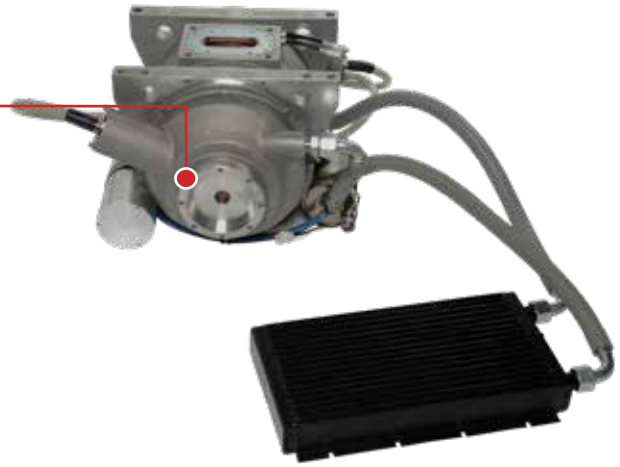
New advanced software features and tools for different clinical applications, such as orthopaedic, spine, trauma and cardiovascular surgery will be exhibited.

To foster the approach of most diverse and individual imaging solutions, a new mobile Cath Lab concept is one of the highlights on display in Vienna.

Visit us at ECR or at www.ziehm.com.

ECR
PRODUCT SHOWCASE

The following are just some of the products and services on display at ECR 2020.
To view these products online or to share the article with colleagues, visit dotmed.com and enter the code DM49881 in the search window or enter the address www.dotmed.com/news/49881 in your browser.



GS-5172 CT tube
Varex Imaging - Expo X2, Stand 223

Varex GS-5172 is offered as a CT tube replacement for Philips CT scanners. There are two versions:GS-5172 is designed to replace the CTR2150CEPN in Philips MX-16 CT scanners and GS-5172B is designed to replace the CTR2150 in Philips Brilliance CT Scanners. Both versions are designed to match the original tube in form, fit and function with 200,000 scans second with a 12-month warranty.

MCS-6074D CT Tube
Varex Imaging - Expo X2, Stand 223

New Varex MCS-6074D is designed as a replacement for the GE Performix 40 X-ray tube on the Optima CT660 CT scanner. Utilizing conventional bearings, the MCS-6074D comes with a 12 month or 6000 patient exam warranty. Replaces OEM part numbers D3187T, D3188T, 2137130-11, 2137130-2

ALTA750®
Richardson Healthcare - Expo X5, Stand 523

The ALTA750® is a form, fit and function replacement for the Toshiba/Canon Medical Systems CXB-750D/4A CT tube. It is certified on OEM platforms, including the Aquilion 4- through 64-slice and the PRIME (Gen. 1). The ALTA750 is CE approved and is available with a 12-month warranty (certain restrictions apply). Stocked in 6 locations around the world and ready to ship today!

RiventTM
ContextVision - Expo X1, Stand 110

At ECR 2020, ContextVision introduces RiventTM, its latest innovation in image enhancement for ultrasound. The solution offers superior image quality and meets increasing demand for stronger processing capabilities without compromising on a natural look.

Rivent provides well-defined borders and efficient noise reduction to enable smooth tissue and true black fluids while maintaining tissue information. The product optimizes image quality in both near- and far-field and automatically adapts to different line densities in real-time, addressing the development towards higher resolution in ultrasound systems.

With Rivent, ContextVision offers ultrasound manufacturers immense flexibility and customization possibilities to meet all user needs and image preferences.

FerrAlert™ Target Scanner™ Kopp Development - Expo X5, Stand 526

Kopp Development Inc., the leading manufacturer of ferromagnetic detection systems for MRI Safety is excited to introduce the ONLY true hand-held ferromagnetic detection system, FerrAlert™ Target Scanner™. Kopp already had the most extensive product offering in the industry. With this new addition, Kopp now has a product for all aspects of MRI safety regarding the magnetic field of the MRI machine. All FerrAlert™ detectors are regarded to be the most accurate ferromagnetic detection systems on the market.

Dunlee DA200ULTRA CT Replacement tube Dunlee – Expo X2, Stand 211

This OEM-equivalent, 6.3 MHU CT replacement tube can replace GE CT tubes in the BrightSpeed™*, Discovery™*, Lightspeed™* and Optima™* families.

Dunlee used knowledge gained through its long history in tube development to optimize this tube, resulting in excellent quality. In fact, Dunlee is so certain of the tube's reliability that it provides a 12 -month, full warranty. The Dunlee DA200ULTRA replacement tube is manufactured in the USA.

*The products listed may be trademarks of the OEM. For the latest information regarding the compatibility of CT tubes and scanners, please refer to our cross-reference guide at dunlee.com

Xpert bundle with CT8000: High-resolution one rotation scan Dunlee – Expo X2, Stand 211

The bundle has been developed and designed to perfectly fit into high-end CT systems. The wide X-ray tubes` coverage allows to scan the entire organ up to 16cm in one single rotation. Additionally, its unipolar tube design and CoolGlide™ technology offers exceptional cooling capacity. The Xpert bundle consists of an X-ray tube assembly, generator, cooling unit and cables. Additionally the Xpert bundle can be combined with the CP700. The components are supplied readily calibrated and configured to help reduce your required R&D resources and costs. On top of that we offer an all-round support during development and throughout the whole product lifecycle. You are set for an efficient production and clinical workflow.

AMST, a Kentucky Trailer company - Expo X5, Stand 530

Is your radiology department looking for quality imaging space outside the hospital footprint? In addition to standard mobile units, AMST manufactures transportable solutions. Transportables are oversized, semi-permanent medical units that bridge the gap between mobile units and modular buildings or fixed sites. At dimensions of 48-ft. or 60-ft. long and 10-ft. or 12-ft. wide, transportable solutions provide significantly more interior space than mobile units, without the construction costs and regulatory issues associated with fixed builds. Transportable solutions are highly customizable and provide an attractive and spacious environment for imaging. On wheels, transportables can be made to appear fixed but are easily removed when a project is completed.

European radiology is faced with its own unique regulatory demands, provider challenges and shifting political landscapes. Here are just a few of the biggest stories covered online by HCB Daily News from the last few months.

Cancer Research UK to create global hub for radiotherapy

Posted online November 06, 2019

Cancer Research UK is pledging £56 million to the development of a global hub for radiotherapy research to further develop advanced techniques and technologies such as FLASH therapy and artificial intelligence.

Known as Cancer Research UK RadNet, the hub will be a network of world-first exploratory projects for enhancing mainstay treatment. Its work will be divided among the Universities of Cambridge, Glasgow, Leeds, Manchester and Oxford; the Cancer Research UK City of London Centre; and The Institute of Cancer Research, London in partnership with The Royal Marsden NHS Foundation Trust.

"Radiotherapy is a cornerstone of cancer medicine, with around three in 10 patients receiving it as part of their primary treatment," said Michelle Mitchell, chief executive of Cancer Research UK, in a statement. "The launch of our network marks a new era of radiotherapy research in the U.K. Scientists will combine advances in our understanding of cancer biology with cutting-edge technology to make this treatment more precise and effective than ever before."

More than 130,000 patients across the U.K. are treated with radiotherapy annually.

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MR incident in Sweden lands nurse in intensive care unit

Posted online October 29, 2019

An MR incident has landed a clinical staff member in the intensive care unit at a hospital in Sweden.

An unnamed male who works as an X-ray nurse was seriously injured after becoming stuck in the magnetic force of an MR at the entrance of Sunderby hospital. Two security guards who tried to help him also suffered minor injuries.

"We have a pretty good picture of what has happened and the police are connected because this is a workplace accident. It is a tragic event and the X-ray nurse in question has a long experience," said Per Berglund, head of the county health care division in Norrbotten County, in a statement.

The incident took place when the nurse approached a patient undergoing an exam. The patient was not physically injured, according to the hospital. The nurse was removed from the bore by guards and was reportedly unconscious and fell straight to the floor upon being pulled out.

An ambulance arrived to transport the man to the main hospital building shortly afterward.

Share this story: dotmed.com/news/49000

Dutch Hospital consolidates medical imaging with Sectra's enterprise imaging solution

Posted online November 13, 2019

Sectra will install its enterprise imaging solution at the Dutch hospital Ziekenhuis Gelderse Vallei, providing a single point of access to all images, videos and data across multiple departments and thereby reduces IT complexity and improves patient outcomes through increased clinical workflow efficiency.

The solution will be shared across its departments for radiology, nuclear medicine and cardiology, and will integrate with their EMR. This will enable access and sharing of images and information across the entire clinical pathway and provide clinicians with a complete patient record.

Ziekenhuis Gelderse Vallei provides healthcare in western and central Gelderland as well as eastern Utrecht in the Netherlands and provides specific healthcare for people outside this region.

In addition, the solution also includes Sectra Image Exchange Portal, which enables secure sharing and collaboration around images and information with others outside the hospital when needed-for example, other healthcare providers, patients and insurance companies.

The contract was signed in October 2019 and the Sectra solution will handle approximately 250,000 examinations annually.

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Lunit announces its first CE Mark for AI-powered chest X-ray analysis software

Posted online November 20, 2019

Lunit has received CE mark certification for its most up-to-date chest X-ray analysis solution, Lunit INSIGHT CXR. The software provides analysis of chest X-ray images, detecting major findings that can lead to the most common lung diseases.

"We are delighted to announce that one of our most mature products, Lunit INSIGHT CXR, has won CE marking," said Dr. Brandon Suh, CEO of Lunit. "We look forward to installations among hospitals across Europe, where an improvement in healthcare services in the region can greatly impact many people's lives."

Lunit INSIGHT CXR detects 10 major chest abnormalities including nodule, calcification, pneumothorax, consolidation, fibrosis, and more, also supporting tuberculosis (TB) screening. The detection accuracy reaches at average 98.7 percent.

The AI analysis results are presented on the chest X-ray image, providing the location information and the abnormality score, which reflects the probability of the existence of the detected findings. The software also generates case reports that summarize the evaluation for each case, conducted by the AI.

Lunit INSIGHT CXR is clinically installed for use in Mexico, UAE, China, Thailand, and Korea.

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Royal College of Radiologists calls on government to prioritize imaging and cancer care

Posted online December 26, 2019

Following last week's General Election and establishment of a Conservative majority, The Royal College of Radiologists (RCR) has called on the Government to urgently prioritise and boost funding across the five key areas impacting on NHS imaging and cancer care.

Writing to Prime Minister Boris Johnson today, RCR President Dr Jeanette Dickson stressed that patient safety is being jeopardized by short-staffing across imaging and interventional radiology teams, meanwhile, the cancer care workforce is unable to keep up with demand and ensure patients all get the same treatment.

In her letter, Dr Dickson calls on the Prime Minister to provide "substantial, focused and sustained" investment in imaging and cancer care, with a dedicated focus on increasing staff, better technical equipment, better facilities and more space, enhanced IT and commitments that Brexit will benefit the NHS.

She concludes by urging Mr Johnson to act now, and not throw away the chance to bring about genuine improvement to NHS resourcing.

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Uppsala University Hospital first in Sweden to treat patient with Elekta Unity cancer treatment system

Posted online November 14, 2019

Sweden's first-ever patient to be treated on the Elekta Unity MR-Linac radiation therapy system took place at Uppsala University Hospital. The system allows doctors to confidently see and track the targeted tumor during treatment and respond accordingly, personalizing therapy for each patient every time they are treated.

"This can increase the chance of better tumor control and less risk of damage to surrounding healthy tissue, especially for tumor sites which are hard to visualize with non-MR techniques," said Zahra Taheri-Kadkhoda, head of radiation treatment at Uppsala University Hospital. "The MR-Linac is also an inspiring project for broad and open collaborations between different medical disciplines and technical professionals with an ultimate goal to improve patient care."

There are currently 18 Elekta Unity systems in operation globally, of which eight are in Europe.

"Both Elekta and Uppsala University Hospital are renowned for their innovative approach to providing advanced cancer care. These synergies will benefit many of the more than 60,000 people diagnosed with cancer in Sweden each year," said Elekta president and CEO, Richard Hausmann.

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Q&A with Borja Ribed

CEO of APR Salud

Discussing the European service market for imaging equipment

By Gus Iversen

With the annual ECR meeting right around the corner, HealthCare Business News got in touch with Borja Ribed, CEO of APR Salud, a 20-year-old independent medical equipment service company based in Spain, to get some insights on what the European market is like for service companies.

HCB News: The independent service market in Europe has grown significantly in the last several years. What are some of the key factors facilitating that growth?

Borja Ribed: In recent years, the world economy has been opening up with few niches closed to competitiveness and efficiency. Historically, the maintenance of diagnostic imaging equipment had been one of those niches but, triggered in part by the 2007 crisis, Europe could not remain aloof to these changes.

HCB News: What factors work against the growth of independent service?

BR: On one hand, the movement of OEMs to reduce their service contract prices while they try to increase their service levels. On the other hand, the ability of independent companies to adapt their capabilities, processes and services to growing customer demand. These factors, an external market´s approach and an internal one of added value, are the pros and cons against the growth of independent services.

HCB News: APR Salud has been in business for 20 years, how have the needs of your hospital clients changed over that time?

BR: Healthcare institutions used to focus on results more than patients. Now, patients are in the middle of healthcare service so providers require a faster response time, 24/7 attendance, and greater flexibility. In addition, the pressure on prices has been increasing year over year. Last but not least, in 2014 VAT taxes increased in medical supplies from 10 percent to 21 percent, which directly impacted end users.

HCB News: Where does Spain stand in comparison to other European countries in terms of imaging technology and resources?

BR: Spain has deeply suffered the financial crisis of the last decade due to the weight that construction had and still has in Spain´s GDP. As a result, investment in imaging technology and related resources has been stopped for many years.

Regarding Spain´s obsolescence in medical devices, COCIR is the European Trade Association representing the medical imaging, radiotherapy, health ICT and electromedical industries. In 2003, COCIR drafted a set of prudent "Golden Rules", on the basis that an appropriate mix in the age profile of installed systems is essential for efficient and productive healthcare systems.

Unfortunately Spain is at the bottom of the list when compared to all European countries.

HCB News: Are European countries going to adopt the in-house service strategies that have gained popularity in the U.S.?

BR: In Europe, in-house doesn't make a lot of sense right now. In some countries, including Spain, any service company working with ionizing radiation equipment (such as CT and X-ray), must have all permissions of the Nuclear Security Council. Obtaining those permissions implies huge administrative work and monitoring and control of the highest quality standards, thus a significant barrier.

HCB News: When it comes to imaging equipment service, what can the U.S. learn from Europe, and vice-versa?

BR: U.S. has a better mix between OEMs and independent companies regarding maintenance services. I strongly believe that the best solution for the clients is to be able to choose between different service providers. Following the trend of the last years commented on before, I believe Europe will soon achieve the U.S. ratio.

On the other hand, in Europe, the coexistence of a bigger portfolio of multiple OEM companies offers a wider range of solutions. This affects directly independent companies when services are needed.

In the U.S., companies tend to be highly specialized and this is directly related to the size of the U.S. market. Europe is made of smaller national markets. Their smaller sizes do not allow such specialization, therefore companies like APR Salud need to offer not just high-quality maintenance services, but also new and refurbished systems, turnkey system removals and installations, and even deploy IT solutions like PACS, post-processing or dose management software, with a partner approach.

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Goldilocks and the three PACS

By Michael J. Cannavo

With better than 95 percent of all facilities in the U.S. having PACS, navigating the vendor pitches can be a challenge. The PACS market today almost exclusively deals with either a hardware and software upgrade of an existing vendor or an outright replacement or consolidation, where multiple PACS from different vendors are bundled into a single solution. These can be from either one of the incumbent PACS or an outside vendor. This excludes the inclusion of third party applications like AI (artificial intelligence), digital tomography, 3D reconstruction, and other areas.

Features and value propositions that make certain solutions a better fit than others are often determined by whose system the group is used to reading from and what other PACS they are familiar with. With the possible integration of artificial intelligence (AI) aside, most PACS simply try and emulate features that are found on other PACS that have been very well accepted. This makes the decision of a replacement PACS even more challenging. When you put several PACS side-by-side one system seems to morph into another. One vendor may provide a few extra features but often end users forget to ask how important these are in the day-to-day readying process and how they impact workflow. Three-dimensional (3D) reconstruction is used by many but how this is implemented impacts the individuals doing the reconstruction. Does the radiologist want to do the 3D themselves or have it sent over to them already processed? If they do it themselves they need to understand that it may slow down their reading process, costing them time and money. If the tech has to do the reconstruction it may lead to fewer studies being done over the course of a day and negatively impact both tech productivity and hospital profitability. The same can be said with just about any software application used. It's all about finding the right balance.

A radiologist using a PACS needs to be like a carpenter. The tools you use most frequently should be on your tool belt and available within reach at all times. Others need to be available in the truck and easily accessible. The last group, the ones used sporadically if at all, should be back at the shop where they can be selected as/when needed.

A PACS end-of-life is typically six to seven years after it is first put in service, although many systems are used longer. This is up from years past where five years was the norm when a PACS would be replaced. PACS need to last longer and provide more years of service because there often isn't money in the budget to replace an existing PACS. Sometimes a simple upgrade to the existing system will buy an extra year or two before a PACS can be fit into the budget. Additionally

Your facility (right) getting acquainted with three PACS offerings (left).

buying a new PACS isn't like buying a new car. Data and databases need to be migrated, networks may need to be upgraded, hardware and software may need to be replaced, and other areas need to be considered. This impacts not just the baseline PACS but also ancillary and third party applications that may be running concurrently on the workstation. We are seeing this now as Windows 7 hits its end-of-life (EOL) early next year, and the migration to Windows 10 requires upgrades for many of the other applications running on the workstations. Some of these simply require software updates and upgrades that may be done for free, while others have unanticipated costs attached to upgrading them. Using the car analogy, it's like budgeting $X for the car then finding out you need different tires and suspension and an options package that has options you probably will never use but it's the only way you can get the one application you had before and both liked and used extensively. Welcome to the world of PACS. Upgrades are the same way. For every one new feature you get, the chance that you will lose a feature you enjoyed is actually quite good. That is why few sites implement every software upgrade when it becomes available. Not only is the software often not completely stable despite all the testing it goes through before it is released, but you tend to lose things you really liked.

So what do you look for in a new PACS? it's sorta like Goldilocks and the Three Bears. The one you really like best is nice but you can't

afford it so it gets disqualified. Sadly none of the people selling it are creative enough to know how to overcome a price objection which is about the easiest objection to overcome if they are creative. This second PACS really doesn't meet all your needs other than being cheap enough, so you hesitate to buy it. Anyone who has bought on price alone knows that oats that have been through the horse once are a bit cheaper… And then you find your dream PACS — the one that is juuuust right. You are ecstatic until you finally get around to signing the contract and the company you chose has been sold to one of the big six vendors and put into limbo indefinitely until they can figure out just what to do with it.

So how do you start? Forget the PACS. Now I know you want to drug test me to see what I'm on but the PACS is the *least* important part of the system. I see the vendors stoking the very same fires that once took care of Joan of Arc, Basil the Physician and hundreds of others for heresy, but hear me out. The most painful part of the transition from the existing PACS to the new PACS isn't the implementation of a new system but the migration of the data from the existing proprietary archive that most have to a vendor-neutral archive (VNA). The cost of this VNA and the migration can easily equal at least half of the total cost of the new PACS, and sometimes doubles the projected cost. Because of this you really want to only do this once. It is painful? Beyond painful, very costly and typically abysmally slow as well. But once you have done it and have all your data in a VNA; in theory, all you need to do on your next PACS replacement is to disconnect the VNA from your current system and reconnect it to the new system. Now I say that it's "in theory" because it's never quite as simple as that but it's nowhere close to the agony (and cost) you go through migrating from the existing vendor-based archive to a vendor neutral archive. In the end the ecstasy of having data that can go anywhere and that you can do anything is definitely worth it.

Now what about the PACS? There are differences between all the vendors that go well beyond price. That said, nearly every vendor out there has a hammer, 2 screwdrivers (regular and Phillips-head), a pair of pliers, both electrical and duct tape, and other basics on their workstation. Most also have advanced software packages available like orthopedic templating, mammography packages, 3D reconstruction, artificial intelligence, and more. These add-on applications are the things you should look at closely after you evaluate the basic system operation, how easy it is to use, and how it addresses your existing workflow. You also need to look at things like a company's service and support reputation, which is crucial. When the system is up and fully operational things are great. When it is down you will wish you were on vacation on a cruise ship with no communications at all. How quickly a company can diagnose and rectify a problem WITHOUT POINTING FINGERS is one of the delineators that you need to look at closely.

I read a great article the other day about how the 2018 Winter Olympics in South Korea were victims of a cyberattack that was launched as soon as the games went live. The IT team running the show behind the scenes worked together to FIRST get everything up and running, and THEN tried to figure out what happened after. That is what vendors need to do with your PACS as well. Get it fixed then figure it all out later. Act like the whole world is watching because while the entire world isn't watching, your whole world is. And the circumstances can be as bad, if not worse, than the South Korean IT team would have faced had the Olympics been shut down.

A loss in confidence in a PACS is a loss of confidence in radiology and the hospital's IT department, so you need to go all-out to make sure PACS stays up. This doesn't mean that you run out and buy the first PACS that offers you the mythical 5-9's of uptime because no one can, has, or ever will hit anywhere close to that ideal number. It will also be fraught with exclusions that never let it come close to meeting that number anyway. Instead buy the one you feel most comfortable with.

My mantra in life is the same with PACS — think with your head, not your heart because as much as you might like a PACS for what it offers, what you don't know might truly break your heart.

About the author: Michael J. Cannavo has 30 years of experience in the evaluation, design and implementation of PACS and associated clinical systems, including RIS.

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A tale of two kinds of RIS solutions

Whether you're part of a health system or a smaller service provider, getting the right radiology information system requires understanding your unique needs.

By Don Dennison

Radiology information systems (RIS) have played an important role in the transformation of departmental operations from paper to digital. As with other applications, the market has evolved, and industry has adapted their solutions. Health providers today have options, but the market is increasingly being divided into two primary approaches — one for health systems, and one for groups, like radiologist reading groups, serving smaller health providers.

How we got here

The advent of RIS gave healthcare organizations, and specifically departmental leaders, insight and tools to effectively manage their operations. Predating picture archiving and communication systems (PACS), RIS managed human resources, patient records, finances, and other elements to provide significant productivity and quality improvements for hospitals, staff, and patients.

During a significant growth period that saw several mature solutions, installed independently of hospital information systems (HIS) and interfacing through HL7 messages, PACS, with its digital images, was introduced, leading to further benefits.

It wasn't long before the push began for a combined RIS-PACS solution. At the time, it made a lot of sense. Both systems have a patient and exam database table. Both have HL7 interfaces for patients, orders, and results. Both must manage users. And managing the complete life cycle of an imaging procedure in one system — from order placement, through scheduling, exam protocoling, image acquisition, exam quality control, reading, and results management — promised new opportunities for quality and productivity, with lower costs and less complexity.

Industry responded and companies providing independent RIS solutions were

acquired by PACS vendors. Other PACS vendors set out to develop a RIS-PACS solution themselves.

As this convergence was occurring and solutions emerging, something happened: the adoption of the EMR with an embedded RIS module.

RIS in today's consolidated healthcare enterprise

The rapid and widespread adoption of a shared EMR across a multi-hospital enterprise is often attributed to the incentives provided in the HITECH Act, at least in the U.S. But the operational and financial benefits of using one system to manage records and work tasks, and standardizing operations and measures across facilities, has led to adoption of this approach in other geographic markets as well.

The shift from an independently deployed RIS solution to one provided by the EMR has provided several benefits, with some tradeoffs. It has also resulted in a shift of control. Healthcare providers have reported advantages including:

- System maintenance, including updates, upgrades, backups, failover, hardware refresh, and other efforts, are shifted away from radiology IT staff to the EMR team, reporting into the CIO/CMIO.
- The interface from the HIS/EMR to the RIS system has been eliminated, as the RIS module shares the same database table as the EMR, improving reliability and reducing complexity.
- Access to patient information and reading worklists are available within the same application, simplifying desktop integration.

Radiology staff spend less time on the IT aspects of the system and more time on system configuration and operations. This can often require a shift in departmental staffing profiles and job descriptions.

On the flip side of the benefits, radiology staff report there are tradeoffs, such as:

- Overall planned system downtime, and the timing and scope of testing associated with an EMR upgrade, is decided by a team outside the department.
- Getting operational reports, while technically feasible, can often lag departmental expectations as they need to be developed by a central EMR team that is serving the entire enterprise. Radiology staff often cite a regression in insight into their departmental operations compared to when they had full and direct control of their data.
- System configuration changes, such as how the patient chart is presented, how worklists are configured, what data is stored in the system, and the list of procedures available to order, are all difficult to obtain in a timely fashion. This will vary based on the organization, their operating procedures for system changes, and the working relationship between radiology staff and the EMR team.

The shift from an independently deployed RIS solution to one provided by the EMR has provided several benefits, with some tradeoffs. It has also resulted in a shift of control.

Often, the decision to use the reading worklist provided by the EMR's RIS module, one provided by the PACS, or a stand-alone solution, is heavily debated. There are pros and cons to each, with the EMR-RIS option providing some operational and management benefits, and the PACS (depending on its capabilities) or stand-alone solution providing more flexible and sophisticated workflow orchestration, along with a superior user experience, in many cases.

Additionally, the EMR RIS is typically optimized to provide services for imaging exams performed within the enterprise (which relies upon staff accepting standardized workflows to gain the benefit). In many cases, the EMR RIS only allows orders entered directly and not orders placed by an external system, resulting in added data entry and delays. Radiology staff often have difficulty reading exams that were performed outside the enterprise or accepting orders from outside the enterprise and sending the results back to the system managed by an external organization, such as a referring physician group.

EMR-based solutions often have longer patient registration times due to the number of required fields to be entered. Where imaging center RIS are designed to allow quick registration — for example, an unscheduled patient seeking an X-ray over their lunch hour — EMR are often optimized for inpatient operations and can require extra effort to provide rapid patient registration in outpatient imaging settings.

This can result in so-called exam volume "leakage", as referring physician groups send patients to organizations, such as independent outpatient imaging centers, that can provide this type of exchange of orders and results between systems. This can be hard to detect due to insufficient data reporting.

Capabilities to reduce appointment no-shows and enhance the patient experience, like text message reminders and exam instructions, often depend on third-party applications to be integrated and managed.

For healthcare provider organizations, the benefits of the EMR RIS and standardized operations often compete with the flexibility of an independent RIS solution.

The market for independent RIS

As enterprises get larger through acquisition, and more facilities converge on a shared EMR RIS solution, there are fewer opportunities for independent RIS in markets like the U.S. and others. However, many healthcare provider facilities still rely

on the reading services of contracted radiologist groups. These groups serve multiple healthcare provider organizations, so they need systems that can receive patient information, orders, imaging exams, and prior reports, from external systems to operate with efficient, automated workflow.

If these organizations operate outpatient imaging centers, they may also need to provide a portal for referring physicians to place orders, access results, and perhaps even view images or chat with a radiologist. In some cases, a patient portal is also provided.

As healthcare provider organizations consolidate, so do large reading groups, which merge with local and regional groups and transition to a managed information and imaging platform.

In addition to reading groups, smaller healthcare provider enterprises that do not have a capable RIS module in their EMR may deploy and interface with an independent RIS solution to provide the desired departmental operations. For smaller organizations, it can be more efficient to have a single RIS solution that can manage both operations and billing.

These groups of buyers may or may not need support for academic workflows, like resident-attending read-out or teaching files, common at large enterprises.

The capability to exchange information with the healthcare provider organizations they serve, and provide tools to imaging centers they support, is critical for them. Now, more than ever, they need platforms that can provide interfaces and integrations for interoperability of data. And they need to be able to develop solutions themselves, without relying on a centralized (and often bureaucratic) IT team or a vendor professional services engagement.

Non-EMR RIS solutions include independent applications, as well as ones provided by traditional PACS vendors. These may be developed in-house, added through acquisition, or licensed through a partnership (sometimes varying by region). In some cases, only specific modules, like critical results management or external order exchange apps, are provided. In other cases, the solution is made up of several integrated third-party applications.

For reading groups covering multiple healthcare provider organizations, RIS or RIS-module solutions that can orchestrate the movement of DICOM data from one system to another can be of high value. For example, using order information to move current and relevant prior imaging exam data from one or more PACS into the PACS used for reading.

While there are solutions for this non-healthcare provider enterprise market, organizations often report that their healthcare provider client is unwilling to provide the necessary information through interfaces. Instead, they sometimes insist that the radiologist use the healthcare provider's PACS, reporting solution, and EMR to do their work. This can result in the radiologist having to use (and be productive with) several different systems. The logistics of putting a different workstation for each client in a reading room is often not practical. Not to mention the cost and effort to establish secure network connections (that meet all organizations' information security policies) across enterprises.

The imminent mandate to use clinical decision support (CDS) for some procedures, and the risk to revenue — for organizations that perform the exam and to income for physicians who read exams without providing evidence that a qualified CDS system was used — adds even more complexity. Organizations that provide solutions that put the least amount of impact and disruption on referring physicians may get additional outpatient exam volumes.

For independent reading groups, and even some enterprises, the use of cloud-based RIS, or specific functional modules of a RIS, like external order and results exchange, is likely to become more prevalent.

Where to next?

Radiology is a complex operation and will always require some software application to manage it. But what is likely to change in the near future?

Reading worklists will probably continue to become increasingly sophisticated to squeeze even more productivity out of radiologists. They will incorporate new information, like upcoming clinical appointments and clinical data, to prioritize which exams get read first. Emerging technology like artificial intelligence (AI) may play a large role here.

Direct reporting into the EMR, instead of a reporting solution, is already happening in some cases — for example, for breast imaging and cardiology. While the current state-of-the-art in EMR-based reporting may be less desirable than traditional solutions, the benefit of eliminating an application and the structured nature of EMR-captured results (for clarity, data analysis, and AI applications) hold promise. This transition will take time and effort to provide a good user experience.

For independent reading groups, and even some enterprises, the use of cloud-based RIS, or specific functional modules of a RIS, like external order and results exchange, is likely to become more prevalent. Using a cloud solution provider for all the IT infrastructure and application management, combined with a pricing model that aligns with actual usage, reduces the capital expense requirements on the organization.

Regardless of the form that RIS takes (if we even use that term in the future), the need for solutions that provide highly efficient workflow for radiology is not going anywhere anytime soon.

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Q&A with Dr. Eric Brian Friedberg

The rise of teleradiology

By Gus Iversen

Dr. Eric Brian Friedberg and his colleagues in ACR's Commission on General, Small, Emergency and/or Rural Practices spend a lot of time thinking about ways to improve access to imaging in underserved regions. Teleradiology holds a lot of potential for that, so they asked the question: *to what extent is it actually being used?*

To get their answer they sent a survey to ACR members and received almost 1,000 responses. Over 85 percent of the radiologists surveyed, (and these were all radiologists who did *not* identify primarily as "teleradiologists") had some experience over the last decade with practicing teleradiology. HealthCare Business News spoke to Friedberg, who is the vice chair of the commission, about what those findings tell us about the evolution of teleradiology, and what it could mean for the future of imaging.

HCB News: We sometimes think of teleradiology as a niche segment of radiology but your findings seem to contradict that view. Were you surprised that such a high percentage of respondents were using teleradiology?

Dr. Eric Brian Friedberg: Not at all. We all appreciate the value of this tool. Being able to bring together a diverse group of skill sets through an integrated platform means you don't need all these bodies physically adjacent to one another. It allows for a lot of cross fertilization, but on an even more fundamental level it allows for reading exams for sites that you're remote to. So when you think of 24/7 coverage and holidays, sometimes it's hard to maintain that on-site presence when you have smaller numbers of physicians in the loop.

HCB News: You mention in your study that it's difficult to compare your findings to those of prior U.S.-based research, and cite "differences in the definition of teleradiology, and an emphasis on practices rather than individuals" — how did you define teleradiology and how is that different from other previous researchers?

EBF: We defined it as "anybody who is reading remote from the site where they're practicing," rather than folks who have a core business in teleradiology — which would mean their services are specifically focused on supporting other groups; they're providing over-reads, doing the nitehawking and dayhawking to provide preliminary reads. What's interesting is that the industry has evolved extraordinarily over the last decade, where now teleradiology is used to provide final reads — meaning you see the study, you read it, and that's the final report.

You're no longer necessarily giving a preliminary read for management needs, you're providing a report that is inclusive of all the findings and all the issues that need to be addressed over a much longer term, issues relating to chronic challenges that may not need to be immediately addressed.

HCB News: Would you say that teleradiology has become a fundamental part of being a radiologist?

EBF: It's a statement of fact. The ability to perform readings remotely is just like how we use the internet: buying things or talking to Siri, or applications for AI that we use in our lives without even thinking about it. Any time you have more people who can freely communicate and review information in a collegial collaborative manner, it makes us stronger and enhances our ability to deliver quality care.

HCB News: We often hear that AI may replace radiologists in the near future. We also hear AI is providing an invitation for radiologists to step out from behind the screen and interface more with patients. Does an increase in teleradiology complement that vision or compromise it?

EBF: There's an idea that has circulated for a few years now, that AI could replace radiologists. Well, if AI can replace radiologists it will replace paralegals and engineers and many others, it will be so disruptive to our economy and entire economic structure. Things have got to work together.

AI is the capability for software programs to have self learning capabilities and higher levels or processing data that allow for better assisting humans in doing tasks that historically only a human could do, such as troll medical records for salient past medical history and other relevant clinical findings that are pertinent to developing and interpreting information at hand.

Teleradiology and AI complement one another; teleradiology is the ability to transmit

"Any time you have more people who can freely communicate and review information in a collegial collaborative manner, it makes us stronger and enhances our ability to deliver quality care."

data electronically and review it anywhere. For most of us teleradiology is a tool that allows us to review studies and report on those findings with other software packages, such as voice recognition, and you can have different ways of handling the data, the reporting. Having AI running in the background should make everything more efficient.

HCB News: One-third of your respondents noted "technical interpretation standards" as being a key to improving teleradiology. What might those standards look like?

EBF: We need standards just like in other industries. As you come up with a mission critical technology you want the ability for it to be utilized and adapted for different environments and this is what we want for teleradiology. Right now we have all these different platforms and they need to interface, and as folks get out in front they develop proprietary technology. This can lead to certain innovations that some providers can't utilize due to compatibility issues, and the cost to solving those challenges is prohibitive.

You want standards generated in a manner where these kinds of innovations become more accessible and the ability to integrate them into the EHR has a lower barrier to entry. That's the goal — but how you do it is very complicated. From a business perspective and a care perspective, you're seeking commonalities and opportunities that will be helpful to all.

HCB News: Does your research change the overall understanding of teleradiology in any way?

EBF: People should understand that teleradiology is an important tool. When it first came into healthcare there were a lot of concerns about how that tool might be utilized. Many saw it as potentially providing a way for large entities to hurt practices in a way that had not been seen before, but that's not the way, in general, this has played out at all.

Teleradiology has been very useful in helping smaller groups where they may have a unique need, and to fill that gap in a way that is economically feasible. Larger providers have worked hard to fill a niche that is all about quality of care, and business should follow, and it's been synergistic with private practice groups that are on the ground. It has been an overwhelmingly symbiotic relationship.

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Infusion pumps get smarter and safer in the quest to eliminate dosing errors

By John W. Mitchell


Eric Sato


Shaul Eitan


Matthew Hutchings


Jonathan Stapley

What do 90 percent of hospital patients have in common? They all receive intravenous medications (IV) in precisely controlled amounts as part of their care, according to the journal Nursing Management. This includes treatment requiring a wide range of medications, from insulin and antibiotics to chemotherapy drugs and pain relievers. Most of these fluids are delivered using an infusion pump.

Since coming under FDA scrutiny nearly a decade ago for "persistent safety problems," the common bedside infusion pump has evolved to be safer and smarter. A longtime goal has been reducing medication dosing errors, but an emerging driver is cutting down costs and improving outcomes.

"Around the world, clinicians are being asked to do more with less. Therefore, it is increasingly important that new technology includes built-in drug dose limit ranges that help protect patient safety while increasing ease of use for clinicians," **Eric Sato**, vice president of infusion technologies at Baxter International Inc., told HCB News.

The importance of system design

Infusion pump operation, especially dosing errors, remains a concern. The ECRI Institute listed infusion pumps in its *2019 list of Top 10 Health Technology Hazards*, citing "confusing" dose and flow rates as the core of the challenge.

Manufacturers are taking these concerns seriously. The Plum 360 Infusion System from ICU Medical, for example, uses a unique cassette technology to enhance confidence, safety, and efficiency in the delivery of IV medications. With direct primary and secondary connections to the infusion system's cassette, the pump ensures that every infusion is delivered as prescribed.

"Common errors that have been shown to occur in 48 percent of secondary deliveries are eliminated by the direct connection to the Plum 360 cassette," **Matthew Hutchings**, vice president of global marketing and innovation at ICU Medical told HCB News. "Clinicians and patients can feel confident that the entire secondary medication is being delivered, accurately and on time."

Infusions on the system are not dependent on complex manual workflows, such as head height dependency (differences in pressures within an IV fluid chamber), ensuring accurate delivery that aligns with recommendations from the Institute for Safe Medication Practices (ISMP).

The unique cassette technology allows for simplified, automated air removal, helping to keep the system closed, which is important for reducing the likelihood of infection. Plum 360 also includes an air trap chamber that captures up to 1 mL of air before setting off the alarm, reducing unnecessary alarms.

Baxter recently launched the Spectrum IQ Infusion System with Dose IQ safety software, which is intended to make the creation and maintenance of drug libraries easier. The pump automatically defaults to the drug library at power-on. It requires fewer steps to start an infusion, displays the drug name along with soft and hard delivery safety limits at the bedside, and enables easy, wireless drug library updates to ensure up-to-date programming.

"The Spectrum IQ system was designed to simplify bidirectional EMR integration with auto-programming, auto-documentation, and on-screen bar codes to simplify workflow," Sato said. "And ours are the only infusion pumps with a built-in dose/rate change alert to help clinicians protect high-risk infusions during titrations by intercepting dose changes that could be inaccurate or even harmful."

Infusion pumps beyond the inpatient setting

New solutions are bringing sophisticated pump technology to different environments, meaning they are no longer strictly for hospital use. B. Braun recently rolled out the Perfusor Space Syringe Pump, which it said is the first mobile syringe pump for use in a transport situation.

"We've introduced a wireless syringe pump…as an alternative in the market," said **Jonathan Stapley**, director of marketing - infusion systems at B. Braun Medical Inc. "Now, customers can standardize use on identical platforms for a large volume [hospital] and syringe pumps. The user interface, the drug library software, and the infusions analytics software —the entire user integration — is now the same for the first time."

The company developed the new pump based on customer feedback. For example, B. Braun discovered that none of the major pump makers offered a solution for an infusion pump that can be used in diagnostic CT or MRI. The Perfusor Space Syringe Pump, he said, can remain hooked up to a patient during a CT or MR exam without long trailing tubes, so that medication administration is not interrupted during imaging. The same applications are also designed for use in adult, pediatric and neonates in air and road medical transport.

Avoset Health plans to release an infusion pump in the European market for patient use at home. The AvosetGo will allow for excellent data collection and analytics, which fosters cost-effectiveness, and it's easy for patients to use in their homes, according to **Shaul Eitan**, CEO at Avoset Health. The pump can be programmed online and connected through a smartphone.

Avoset is part of a group of companies that specializes in the electronic delivery of drugs and medications and has more than 100,000 infusion pumps in use in 26 countries. The company's workhorse infusion pump system, Sapphire, is for in-hospital use and for long-term ambulatory applications.

"[Sapphire] is the perfect design for ambulatory care. It can be connected via Bluetooth through a phone. Caregivers can better help the patient at home, especially chronically ill patients," said Eitan. "It can also be used both for subcutaneous or IV applications using a syringe, a bag, and in some cases, a vial."

The home infusion pump market is growing nine to twelve percent globally per year, according to Eitan, who noted that the AvosetGo has an entry price point of about 70 percent less than other options. Preventive maintenance is also simplified, as diagnostic and correcting software for the AvosetGo is downloaded from the internet.

"The online app has a lot of information on what the pump is doing," Eitan explained. "We can look at patient compliance — are they getting their drug? If we see a trend in the pressure for chronic TPN patients, we believe we will be able to see the beginning of an occlusion."

Integrated, smart and secure

As hackers continue to ramp up their interest in healthcare organizations, cybersecurity has become a top of mind concern among pump manufacturers.

"An event of note is the annual DEF CON Bio-Hacking Village Conference," Hutchings said. "This has proved to be a very helpful industry event where we have brought our products to be assessed by white hat hackers looking to find a way into the network connectivity of our infusion pumps. The lessons learned and industry insights we've brought back each year have only made our products and team better."

The manufacturers also report they are looking more to integration and connectivity. Not just for efficiency on the patient care side, but also for system maintenance and PM protocols.

According to Sato, some hospitals (particularly in the U.S.) are demanding that new infusion pump systems include bidirectional EMR integration capabilities.

"Such a level of automation can help also reduce the chance of manual programming keystroke errors, help improve documentation, and streamline pharmacy and nursing efficiency so they can focus on direct patient care," he said.

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Are drone-delivered AEDs the future of out-of-hospital cardiac arrest survival?

By Vivian Nguyen

According to 2018 statistics from the American Heart Association (AHA), the incidence of out-of-hospital cardiac events (OHCA) assessed by emergency medical services (EMS) personnel is only 141 people per 100,000 population. Nationwide, between 180,000 and 400,000 deaths caused by cardiovascular disease overall are sudden, unpredictable cardiac deaths — many of which occur outside of the hospital and potentially are not assessed by EMS personnel at all.

Further research published in the journal *Circulation* confirmed automatic external defibrillators (AEDs) significantly improve survival after cardiac arrest episodes. For over 50 years, research has shown return of spontaneous circulation (ROSC) is not likely achieved via a defibrillator if the shock was delivered more than three minutes after pulseless, shockable rhythm onset. However, many organizations, including the AHA, have adopted the eight-minute standard, which is the target time from the dispatcher receiving the emergency call to arrival of a defibrillator on scene. Researchers tested this eight-minute standard and discovered that a mere reduction of one minute can save an additional 23 lives per year, and a reduction of two minutes saves up to 51 more lives per year. So why set the bar at eight minutes?

Traditionally, patients who need emergency defibrillation have two methods of obtaining a shock via AED: 1) a bystander who finds and accesses a static AED in a public location or 2) provided by EMS who arrive on scene. Time required for AED arrival is heavily impacted by AED accessibility and EMS coverage, especially in rural, less accessible regions, compared to urban areas.

Research examining AED accessibility and its effects on AED coverage over 17 years found that 61.8 percent of all cardiac arrests occurred in public locations. However, AED coverage in public locations decreased significantly by 53.4 percent outside of normal business hours such as evenings and weekends. Rural areas have even more difficulty accessing timely lifesaving treatment, due to far distances from a dispatch center in conjunction with decreased volume of public AEDs overall.

Drones are already being used worldwide after major natural disasters, including the Haiti earthquake in 2010, hurricane Sandy in 2012, and the Nepal earthquake in 2015, delivering small aid packages across terrain that was unsafe via land travel. Since then, the uses of drones to assist in efficient, cost-effective delivery of healthcare have been countless. Previous studies have already proved that drones are a safe and feasible alternative for providing delivery of blood products, vaccines, and testing kits, especially to communities with poor road systems, disease endemic areas, or that have limited healthcare provider availability. Theoretically, if drones can deliver AEDs faster than traditional EMS response times to provide timely shocks, then OHCA mortality could decrease significantly. Are drones the future's answer to saving lives?

Upon further research, three studies were found to have conducted the most extensive analysis on how influential AED drones could be in increasing survival rates. One study conducted in Sweden found that AED-equipped drones were predicted to arrive before EMS responders 93 percent of the time in rural OHCA cases, which saved an average of 19 minutes in travel time. Another study in Salt Lake City, Utah found using preexisting EMS infrastructure in addition to establishment of new drone launch sites provided 90.3 percent coverage of the intended area within a 1-minute time frame. Finally, a study in Toronto assessed a region-specific network, which revealed that AED-equipped drones arrived before emergency responders in 94.6 percent of cases for the three-minute response reduction goal.

All of these studies theoretically concluded that a drone network equipped with AEDs has great potential to speed up arrival time to an OHCA. This preliminary research illustrates that drones can help save cardiac arrest patients in not only rural settings, but also in high building locations, mountainous areas, or other settings lacking rapid AED access.

Drones can provide 24/7 AED availability to both public and private locations and provide life-saving support to the bystander and the OHCA victim. Drones can be equipped with video, voice, and speaker capabilities the dispatcher can use to help guide the bystander through pre-hospital care including high-quality CPR before EMS arrival. The dispatcher can also assess situational safety for both the patient and bystander simultaneously to prevent further adverse events for all parties.

Because the studies used mathematical models to simulate drone deliveries, they did not account for possible adverse weather conditions, operational error, or technical malfunctions of the AED devices, which are all very realistic limitations to drone deliveries of any kind. Studies that control for the aforementioned factors should be performed in the future to properly assess the efficacy of drone-delivered AEDs on OHCA mortality rate specifically.

The likelihood of a layperson to use an AED is yet another challenge to face. Though AEDs provide clear instructions, many people are either unfamiliar with an AED and its functions or are uncomfortable utilizing it when needed. However, delivery of AEDs to bystanders gives them a chance at administering a shock to a cardiac arrest patient as opposed to not having AED access at all.

Further research also shows that bystanders' experiences with retrieving AEDs via drones felt safe and overall provided a sense of helpfulness and relief. Integrating a drone network into society's daily life may increase comfort and public acceptance overall in order to successfully deliver AEDs via drone. Overall, AED-equipped drones would add another link that must be worked seamlessly into the chain of survival.

Agencies such as the Federal Aviation Administration (FAA) and other governmental entities would require policy and guideline changes specifically addressing medical drones and flight restrictions. Security of patient information in compliance with HIPAA would need to be carefully considered as well. Production and maintenance costs of adding drones into the chain of command in addition to existing EMS infrastructure is another avenue that should be explored.

Beginning in 2017, the Unmanned Aircraft System (UAS) Integrative Pilot Program (IPP) in partnership with the U.S. Department of Transportation (USDOT) and the FAA have made significant advancements toward safe drone integration at both local and national levels. The City of Reno, Nevada was chosen as an IPP Lead Participant site and chose Flirtey as their partner, a Reno-based drone delivery company established in 2013 as the first drone delivery service in the world. The project focuses on drones to deliver AEDs to decrease OHCA mortality.

These partners have been granted ability to fly drones beyond a pilot's visual line of sight, conduct night operations, and fly over people, all of which were significant barriers previously to integration of drone networks. This program will integrate established EMS infrastructure that will provide opportunity for an AED-equipped drone to be dispatched at the same time EMS responders are deployed. The project is set to officially launch in 2020.

About the author: Vivian Nguyen, PA-C was born and raised in Albuquerque, NM. She received her Bachelor of Science in Exercise Science from the University of New Mexico. She recently graduated with her Master of Physician Assistant Studies from Pacific University in Hillsboro, OR where she completed her capstone project researching drone-delivered AEDs and their possible impacts on survival rates. She currently practices as a certified physician assistant in Emergency Medicine in western Colorado.

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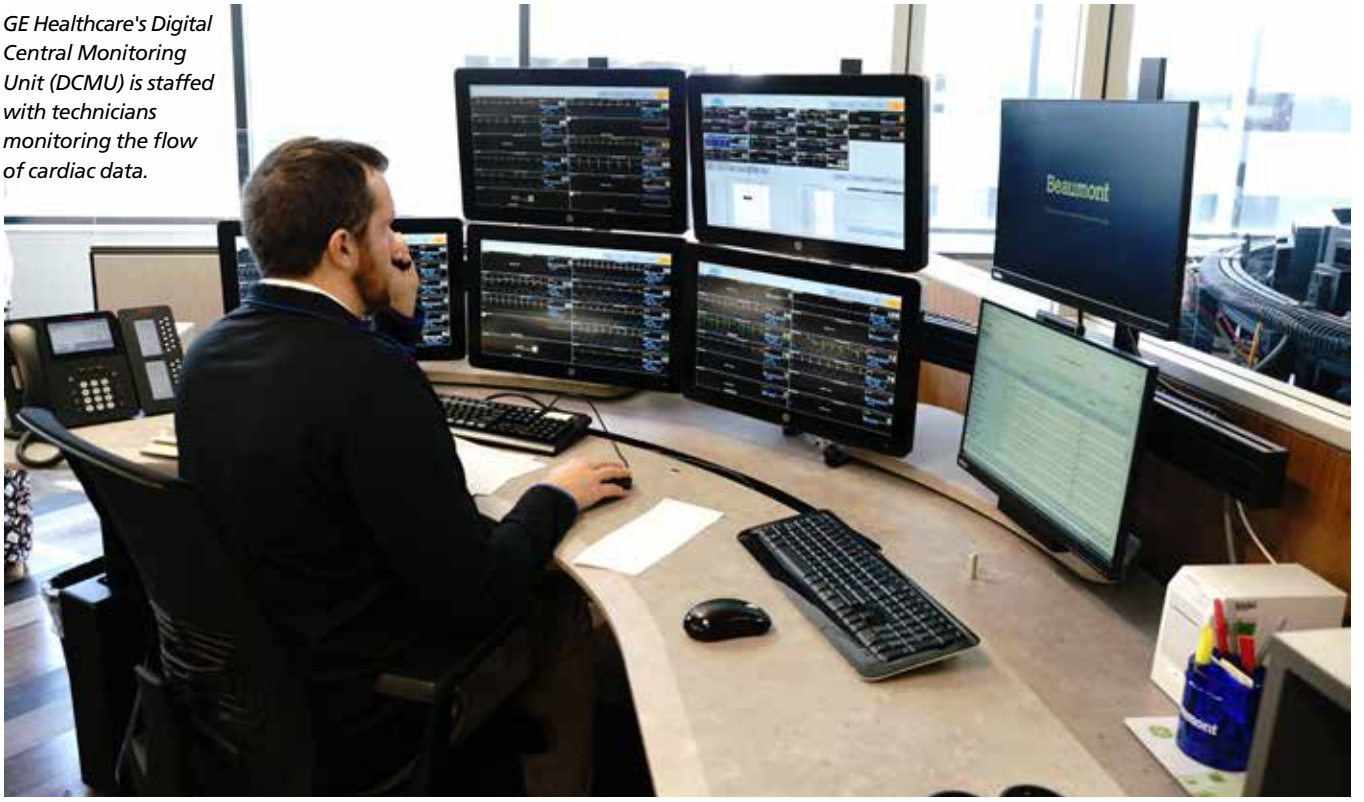
From alarm management to AI, patient monitoring gets a facelift

By Lauren Dubinsky



GE Healthcare's Digital Central Monitoring Unit (DCMU) is staffed with technicians monitoring the flow of cardiac data.

The hazards of alarm fatigue are well documented in healthcare. For almost a decade, ECRI Institute has considered alarm fatigue a major health technology hazard, and although progress is being made, perfecting alarm management remains a work in progress.

Historically, patient monitoring systems have been toward the top of the list when it came to technology causing fatigue due to unnecessary alarms. Today, some patient monitoring companies are offering features that allow for customizable alarm limits based on the patient's baseline reading. Innovations like this allow clinicians to tailor notifications based on a given patient's specific condition instead of using default limits that may be too wide or narrow for the individual.

"As part of our evaluations we spoke with hospitals that use these monitoring systems," **Priyanka Shah,** senior project engineer of health devices at ECRI, told HCB News. "The common theme is that these data are very helpful for them to make a case, to modify alarm limits or to change the priority of certain alarms."

Another way to curb unnecessary patient monitor alarms is to visualize the data and discover patterns. Nihon Kohden created a platform called Aware Alarm Management that gives clinicians a report listing the times that each device set off an alarm. It shows all the different alarm incidents, enabling the hospital to quantify how well their alarm management strategies are working.

"Over one week they could assess all of the alarms that are happening on a particular unit and then implement a new strategy, such as replacing ECG leads every 24 hours," said **Elias Bitar**, director of patient monitoring, marketing and business development at Nihon Kohden. "Then, over the next week, they can actually track to see how effective that policy has been at reducing alarm fatigue."

ECG leads are commonly considered a nuisance alarm since they often occur when there is not a cardiac event, according to Shah. Still, failing to recognize and address a leads-off alarm may cause higher-priority alarms to not sound despite a serious cardiac event.

GE Healthcare takes a command center approach to addressing alarm fatigue. Its Digital Central Monitoring Unit (DCMU) is staffed with dozens of trained technicians that constantly monitor the flow of patients' cardiac data. For instance, if a lead wire has

been off for too long or a patient's heart rate is too high or low, the technician will send a broadcast alert to a specific care team in the form of a text message or phone call.

Beaumont Health in Michigan leverages DCMU for several of its facilities. Each technician, including the DCMU staff, is equipped with a comprehensive communications platform called Mobile Heartbeat that enables technicians, nurses and doctors to collaborate via either a mobile device or desktop app.

"The overall theme is that if we bring together as much data on the patient as possible, clinicians can make better decisions," said **Ajay Parkhe**, general manager GE Healthcare Monitoring Solutions. "EMRs are still focused on documentation and legal coverage, less on clinician decision support. In the future, data liquidity will improve, and the focus will be on better decision making."

For Philips, addressing alarm management means working with hospitals and clinics to understand workflow and processes that help define the right staff responses to these alerts.

"We support clinical change management with our professional services and enable staff with data by leveraging alarm data, analytics and audit logs exported from our systems," said **Peter Ziese**, business leader of monitoring analytics at Philips.

The company offers a clinical decision support tool called Alarm Advisor that provides feedback on how clinicians are responding to each alarm. By tracking silencing behavior, it can alert the clinician when a patient's warning system is too sensitive because their threat threshold might not be set properly.

Integrating patient monitors with the EHR

Interoperability has emerged as a holy grail in healthcare. Getting disparate systems to communicate and play nice with each other is a departure from how solutions were historically developed, but manufacturers have heard the call. Ultimately, interoperability breaks down antiquated silos and allows providers to get patient data from one place to another in a way that fits their workflow.

Last year, Nihon Kohden released NK-HiQ Enterprise Gateway as an interoperability platform for their entire ecosystem. It features different applications based on what the facility wants to connect to — with the electronic health record being a common choice.

Philips is working with industry partners to make it easier to share information between systems. The company envisions a future in which the complete patient record, including patient physiological data, can be used to guide decision-making at the bedside, a central station or a mobile device.

"Developing technologies will be complementary to the EHR — as opposed to an out-and-out replacement — since the EHR was designed in response to Meaningful Use," said Ziese. "The EHR will play a supporting role in the more exciting technologies related to predictive algorithms etc., and the 'platformization' of healthcare."

In terms of which facilities are making the most inroads with EHR integration of patient monitors, ECRI Institute has found it's more prevalent in higher-acuity care settings such as the intensive care unit. Although adoption is growing in the lower acuity care areas where spot check monitors are traditionally used, the demand is greater where patients are continuously monitored.

"EHR integration is complex and expensive, which has led to slower adoption on the lower acuity care settings," said Shah. "For hospitals, it makes more sense right now to integrate it with the higher acuity patient monitors."

The next generation of patient monitors

AI requires a repository of good (patient de-identified) data that provides an actionable outcome. While progress has been made in recent years, Shah said more work needs to be done before patient monitors are truly tapping into these sophisticated algorithms on the clinical level.

"When patient monitoring vendors tell us they have new features that use AI, we want to dissect what they really mean by AI because it has many different interpretations," she said. "From our experience, vendors use the term AI and machine learning but when we ask in-depth questions, we don't get the responses that would convince us completely."

Although smart algorithms for patient monitoring may not be making the same kind of progress that's being seen with imaging, for example, there is plenty of reason to believe that big data will play a bigger and more important role as new technology rolls out.

"Today, patient monitors provide excellent surveillance over patients, especially continuous monitors used for the critically ill," said Ziese. "In line with what we're seeing in other industries where technology is becoming more predictive, patient monitors will move from displaying patient data to predicating patient status, helping to guide personalized decisions in treatment for each member of the care team."

He believes that the patient monitors of tomorrow will be able to assess changes in response to therapy, simultaneously navigating multiple conditions and sharing changes in patient management plans in real-time with the appropriate care providers.

Although strides have been made with regard to wireless patient monitoring, there are still a lot of wires near the patient. GE's Parkhe predicts that as many parameters become wireless disposable and allow early ambulation and patient comfort, the company will become more of a software business.

Nihon Kohden uses a hospital's existing Wi-Fi infrastructure to deploy telemetry devices instead of installing a traditional antennae network. This allows for telemetry transport in more areas of the hospital at a much lower cost. Expanding on its work with Wi-Fi connectivity, the company partnered with AT&T last February to incorporate 4G and eventually 5G, so that patient data can be shared and sent to the cloud regardless of where the patient is.

"If a patient comes from their home to the hospital then you would have access to all of the data that was measured on the patient at home," said Bitar. "There will be infrastructure in place where all the systems can connect."

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Medical equipment testing in the value-based era

By John R. Fischer

For many years, a transesophageal echocardiogram simply involved the insertion of an endoscope through the mouth and down the esophagus where the head of the device would rest, right behind the heart. While providing clinicians with clearer views of the heart compared to transthoracic ultrasound, the procedure carried additional risks.

If the TEE probe had a bite hole, an electrical leakage could occur. The onset of an incident like this so close to the heart put the patient's life in danger. To prevent this from happening, the Intersocietal Accreditation Commission issued a new standard in 2015 concerning adult transesophageal echocardiography (TEE) testing, whereby the structural and electrical integrity of the transducer must be verified between each use with an ultrasound transducer leakage tester.

"The IAC came out and said you cannot use that probe until it's been electrically tested and proved to pose no harm to the next patient," **Ken O'Day**, vice president of sales and marketing for BC Group International Incorporated, a company that designs an electrical leakage tester for this purpose, told HCB News. "That's moved leakage testing from its traditional place in the biomed arena into the ultrasound and cardiac departments or, depending on the hospitals, anyone else who is actually cleaning the TEE probes between tests. "

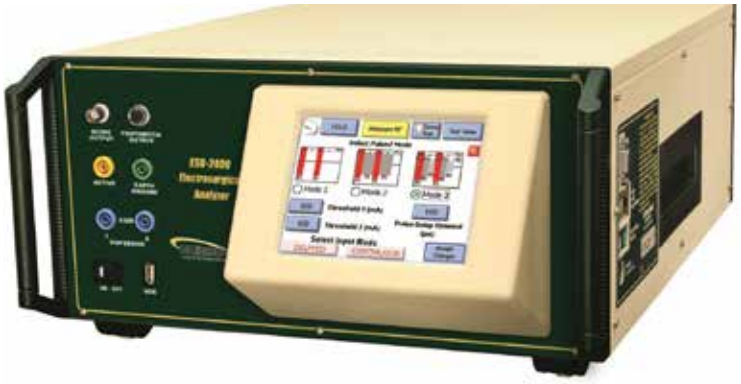
The IAC mandate illustrates how the development and use of testing equipment — just like medical devices themselves — are continuously changing. Also like medical systems, such equipment is subject to various standards and regulations from formal agencies, manufacturers, providers, hospital biomed groups, government inspectors, and medical physicists.

More sophistication calls for new test solutions

As X-ray systems have grown more complex, so too has the test equipment used to validate them. One such evolution has been the development of solid-state multi-sensors for measuring X-ray beam properties.

"In the past, there would be a single sensor placed in the beam, and you would measure the strength of its response," said **Curt Harkless**, president and CEO of Radcal Corporation. "You would manually insert filters into the beam at increasing levels of thickness so that you could characterize the X-ray spectrum. Now, solid-state multi-sensors have multiple sensors with filters in between them so that with a single exposure, you can fully characterize the X-ray beam."

Improvements have also been seen in electrical surgical units that use sophisticated pulsed waveforms that first and second generation ESU analyzers cannot read. As a result, many require a one percent accurate instrument for generator testing, which has led to equipment six years and over that can measure at rates of 5-15 percent accuracy becoming obsolete, according to O'Day.



The evolution of equipment such as electrical surgical units has led to more sophisticated models of test devices such as ESU analyzers to continue to accurately assess functionality. Photo courtesy of BC Group

"Devices have become smaller in size, increasing portability," says **Brittany Schmidke**, national business development manager at Rigel Medical. "There is also connectivity with CMMS programs and between the testing equipment and the device being tested. Prices of the devices have actually come down. Touch screen is ever-evolving, and there are now color screens."

Harkless notes that changes in test equipment, especially within X-ray testing, stem from greater pressure on quality assurance specialists "to get in, get the job done, and get out." Adding that, "anything that saves time is a premium in the industry right now."

While most devices have evolved to the point that older test equipment can no longer provide the functions or accuracy necessary to test these more advanced devices, some types of solutions can still be sufficiently tested with equipment going back decades.

"I used to sell EKG simulators 35-40 years ago," said O'Day. "That simulator back then will still simulate an EKG complex today just fine, but ESU generators, anesthesia monitors, defibrillators and other medical devices have evolved beyond the capabilities of older test devices."

Different paths toward equipment validation

The guiding principle for development and efficient use of test equipment is the ability to test and repair whatever the medical device industry creates, says **Gerald "Jerry" Zion**, global training manager for Fluke Biomedical. For patient monitors this means sending patient-like signals into the medical device just the same as a patient's real vital signs would come in during clinical use. These are called simulations or functional test information.

Increasingly, many facilities are opting to construct biomed teams to assess equipment in-house. While this requires an investment in tools and training, it removes the expense and wait-time that can be associated with depending on manufacturers for testing and repairing equipment.

"Testing and databasing test results day-by-day and year-over-year enable department staff to get a feel for the medical devices in the inventory of the medical facility and for identifying when failure rates rise. As a result, they can find problems earlier, while they are less expensive and easier to repair," said Zion. "That makes sure that critical medical devices — especially those of which are small in numbers — are available and ready to use. Otherwise, the hospital loses money and the patient can sometimes become sicker or lose their life due to the device being broken or unavailable to provide them with treatment."

But constructing such in-house groups can be costly. For some providers, particularly smaller ones, having the OEMs conduct testing makes more sense. **Göran Zelander**, senior product manager for RaySafe's diagnostic X-ray portfolio, says the right choice on who conducts testing has a lot to do with the type and complexity of the device.

"If you look at more expensive X-ray environments, like computed mammography labs or interventional suites, it's going to be almost entirely service contracts handled by the manufacturer because of the complication level and how complex the equipment is, and the knowledge required to test it," he said. "Traditional X-ray and mobile machines, which you have more of, can sometimes be serviced more by in-house engineers."

Karl Ruiter, president of Pronk Technologies, says the decision to test equipment in-house versus having the manufacturer do it can be based on a wide range of factors.

"Maybe the learning curve on a particular device is just very steep, or there may be expensive specialized tools, or the manufacturer does not supply parts or the necessary information for local service," he said. "Possibly the biomed shop is just looking to outsource some work so it does not have to grow its team. Also, anytime there is a warranty repair required, it makes sense to look at having the manufacturer take care of it. It's also true that knowledgeable biomedical engineers, on-site, who are seen as part of the team, can bring a lot to the table."

Abiding by standards

From hospital specifications to ISO guidelines, testing equipment must adhere to a number of standards. Some are required by law while others are not mandatory but strongly encouraged. These guidelines change as technology becomes more sophisticated, with automation, cybersecurity and AI bringing about new advantages and considerations to entire segments of the equipment market. More broadly, regulation is guided by quality of care, user experience, and the diversity of medical equipment needs worldwide.

"If you look at a global level, there will be a lot of testing needs in developing countries such as Brazil and India," said Zelander. "China is well developed, but from an X-ray equipment viewpoint, it's very limited in the number of tests per X-ray machine, compared to the U.S. or Western Europe."

According to Harkless, cost and efficiency demands will lead to more integrated quality assurance processes. Over the next five or ten years, that means testing equipment will move away from the larger instrument models we see today and toward smaller, less expensive solutions.

Manufacturers of testing equipment can help providers keep up with the changing regulatory environment by developing test solutions that can adapt to the new medical developments.

"What we try to do with the testing equipment we build today, is include some kind of an upgrade path, so that as new medical equipment and requirements are introduced, the existing test device can be upgraded to meet the new demands," said O'Day. "This saves the end user from having to purchase a completely new test device to stay compliant."

Zion notes that commercial technologies are influencing standardization around testing equipment, especially around the transmission of information to the cloud. Despite these big-picture changes, the objective behind testing equipment remains the same.

"Our aim is to help reduce risk of injury or death to the patient through our everyday heroes, who are biomedical engineers and technicians that work in hospitals, manufacturing, design of medical devices and in field service," he said. "Detect problems early instead of letting failures happen during clinical use."

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Saving time and money with RTLS

By Sean Ruck


Judy Travis

Judy Travis is the senior director of support services at Texas Health Presbyterian Hospital Dallas, part of the Texas Health Resources system. She's also a Lean Six Sigma Black Belt, which means when a department's not working well, Travis often gets called in to fix it.

That was the case in 2017 when she was tapped to assess the RTLS (real time locator system) that was initially deployed in 2009. Six years had passed between its initial deployment and Travis being put in charge of looking into the system's use and efficacy. The system was intended to save the organization money by optimizing the use of rental equipment and minimizing redundant rentals as well as helping to decrease the need for new equipment purchases. Use of the RTLS system allowed staff to save considerable time spent in searching for critical equipment. At the outset, the RTLS deploy was deemed very successful. It played the usual role of an RTLS, giving staff the ability to know what equipment was on campus, what was in use and what was available.

The system's early success led to too much of a good thing and scope creep occurred without the requisite "feed and watering" as Travis terms it. The individuals who were part of the initial deployment left for other facilities within Texas Health Resources. The RTLS was handed over to another group who expanded its use to include patient tagging.

By the time Travis was asked to take a look, there was about $300K being spent on the system, but it was largely wasted funds as the system was barely being used and that raised big questions. "I was asked to determine if we keep it, discontinue it, or use it in another fashion," Travis says.

Travis set about gathering information. She also gathered a few allies for the task. "I pulled in a finance person and another young lady who works very close with me who's very good at building relationships and seeing the big picture," she recalls.

She also used tools from her Lean Six Sigma training, with the biggest being brainstorming. To that end, she gathered the house supervisors, who according to Travis, are the nurses basically running everything in the hospital as far as bed and patient movement. She also recruited nurse managers and housekeeping to find out who — if any of them — was using the RTLS and how they were using it. If they weren't using it, she wanted to find out why they weren't. Once everyone was gathered for brainstorming and feedback, it was clear there was value in the system. It just needed that feeding and watering.

That meant it had to be looked at to make sure it was working correctly and that its utilization was valid. The investigation was eye-opening. Tags had dead batteries, monitors had dead batteries, meaning those items were offline and had to be found without the help of the system they're supposed to fuel. In some cases, equipment was mislabeled by tag, meaning the system would indicate one type of asset assigned to a tag, but when a staff member located that asset, it would be something other than what was inventoried. Still other tags were just being put to poor use. Travis gave the example of finding a tag on a television bolted to a wall. And finally, tags were walking out the door — to the tune of $30K over the course of two months — on the wrists of patients.

According to Travis' research, there were eight or nine thousand tags around the facility with no one going into the system to make use of them. Pushing forward, she developed her plan. It not only required changing of batteries, but also changing of habits and processes.

Travis realized one of the key hurdles was to get everyone on board with using the system right and also making smarter use of tags. The brainstorming and input from potential user groups spanned about seven months. Presentations were made to the CEO, CFO and CNO two or three times, to explain the opportunities for savings that the system could provide if it was made efficient. An inventorying was done. Tag usage was reduced from that 8,000 or 9,000 to about 5,000. And a new department, dubbed the "Mission Control" team, was created. Staffed by eight to 10 full-time employees, the Mission Control team serves as the operational support for an RTLS system. Daily, this team uses the RTLS system to maintain par levels of equipment on each nursing unit, cleaning equipment as necessary.

Travis also made sure that the company behind the organization's RTLS was aware that they needed to be a partner, not just a provider. Patient tagging was removed and the system was redeployed with asset and staff tagging only. A formal RTLS committee was developed to approve or deny all items tagged. Any new use of tags had to be discussed and justified and then maintained so that the system continued to be streamlined and efficient.

The results of Travis' work will continue to emerge over the years, but the numbers are promising already. "After we redeployed, we had the finance manager go over the numbers. We were able to have a contribution margin of over $400K. That's the cost of the system, full-time employee salaries and benefits. That's our hard savings," says Travis.

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Top takeaways from RSNA 2019

By Gus Iversen

In December the radiology world converged on McCormick Place in Chicago for the annual meeting of the Radiological Society of North America (RSNA). As one might have expected, AI was a dominant topic. There was even an entire exhibit hall dedicated to it.

And yet, in many ways, the human aspect of radiology was even more prominent.

It felt almost as if, after all these years of asking rhetorical questions about computers replacing humans, the industry is finally getting comfortable with the concept of AI and can consider it in nuanced, practical terms. This, the editorial team at HealthCare Business News agrees, is good news for everyone.

AI marketplaces and workflow integration

From Philips' work-in-progress IntelliSpace AI Workflow Suite to IBM›s Imaging AI Marketplace, it felt like every big company debuted an AI "App Store" or platform to integrate curated AI algorithms into the radiology workflow.

"The key to the game is going to be really translating that directly into the clinical workflow, finding ways to be able to really put that in, so that it's not just something that's adjacent or added, so customers don't have to contract with a million different vendors," Kevin Lev, the AI solutions marketing lead at Philips, told HCB News during an interview.

Overcoming bias and encouraging diversity

In a session on the ethical challenges of AI, Judy Gichoya, assistant professor of IR Informatics at Emory University School of medicine, spoke about how racial bias was embedded in a widely-used commercial risk algorithm used to manage population health.

There was also much discussion about bias in recruitment and hiring of female radiologists and physicians of color. During one session on diversity and inclusion in radiology, it was noted that about 50 percent of medical school graduates are women, but only 27 percent become radiology residents, and only 15 percent of medical school graduates who identify as underrepresented minorities pursue careers in radiation oncology and diagnostic radiology.

Addressing burnout

There were at least 10 education sessions devoted to quality of life in the workplace and addressing physician burnout. Experts encouraged wellness and mentoring programs and team-building exercises, and forming committees devoted to ensuring work/life balance.

The conference also featured a Wellness Lounge that offered yoga sessions, and there was chair yoga offered at the end of the day in the Discovery Theater.

Bringing imaging to the bedside

While the biggest news in radiology has been on the software side for a few years now, there was a notable uptick in compact portable hardware for bringing diagnostics to patients who cannot be transferred to the imaging department.

One of the biggest crowd pleasers at the show was Hyperfine, which performed MR scans (of fruit) on site. It was the first time ever that MR scans had been performed at an RSNA meeting. The system requires no shielding and its safety zone on the show floor merely consisted of four stanchions surrounding the bore of the scanner.

Radiology is expanding into new areas

Whether it's evaluating new health hazards or making inroads against dementia, research highlighted at this year's meeting illustrated the growing importance of radiology in a changing society.

A pathologist and laboratory expert on a panel that discussed lung injury related to vaping, told HCB News that radiologists have an essential role in identifying vaping illness. The message was clear: radiologists need to ask direct questions about e-cigarette use, just as they would about tobacco.

Another team of researchers discussed the potential for low-intensity focused ultrasound (LIFU) to play a critical role in treating Alzheimer's disease. The team combined LIFU with MR to open the blood-brain barrier on three patients; a hurdle in the way of providing treatment to the disease.

Simplifying digital breast tomosynthesis reading

While digital breast tomosynthesis (3D mammography) can provide a wealth of diagnostic information unavailable in a 2D mammogram, the scans can yield an overwhelming amount of data. This year at RSNA there were several companies offering software solutions to simplify the reading process.

ScreenPoint medical debuted Transpara 1.6, which ranks mammograms on a 10-point scale indicating the short term risk that cancer is present. Currently, it is FDA-cleared for 2D mammography in the U.S. and is pending clearance for 3D exams.

Hologic introduced its FDA-cleared, AI-powered 3DQuorum technology, which reduces tomosynthesis image volume for radiologists by two thirds, saving an average of one hour per eight hours of daily image interpretation time, according to the company.

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ADVERTISER INDEX

AR/VR is the future of clinical device service

By Art Larson

A CT scanner is down; patients are waiting. The hospital's regular CT service engineer is hours away, but Rachel, another trained service engineer with less CT experience, is on-site.

Rachel connects online with a remote CT service engineer, describes the issue, and slips on an augmented reality headset. With it she can see a virtual overlay on top of the actual hardware in question as the remote engineer guides her to the likely source of the issue. She listens while watching as the engineer's virtual hands demonstrate exactly what she needs to do. In minutes she makes a simple adjustment, and the scanner is back in service.

This scenario is not as futuristic as it might seem. Clinical service engineering is on the cusp of a revolution in virtual reality (VR) and augmented reality (AR) as tools for field engineer training and field service support. It's a revolution as valuable as it is necessary.

Clinical service is changing dramatically. Healthcare providers' demands for efficient, affordable, high-value service are ever-increasing. Meanwhile, the baby boomer generation of service professionals is retiring in significant number. There's a critical need to train a new generation of engineers quickly, and to help those already in the field to be more proficient, versatile and productive. VR and AR are keys to the solution.

VR is an invaluable complement to hands-on training. It lets engineers morph into an environment where they can interact with devices in ways not possible in the physical world. They can explore deep inside a machine and see every component while listening to an instructor. They can quickly learn and practice complex procedures, like changing a CT tube, fixing an MRI chiller or replacing a delicate detector module. They can do procedures in minutes that in the real world would take hours, and can make mistakes without risk of injury or equipment damage.

AR is where the rubber hits the road in clinical service practice. It's a toolkit that can help field engineers perform at a higher level. For example, it can help them service multiple products across modalities in addition to gaining deeper knowledge in their primary modality.

Engineers can view AR images superimposed on the device being serviced, not just through special glasses but through a tablet, smart phone or nearly any mobile device with a camera. An AR application then can act as a mentor, visually and orally guiding the engineer through each step of a procedure so that everything is done correctly and completely.

An AR application can "explode" the device into its components, making visible items that are covered in the real world. An engineer and remote specialist can view the images simultaneously and interact as if in the room together, helping the engineer recall and review procedures learned previously in training.

VR and AR technology will advance rapidly in the next few years. Already, device manufacturers use VR as part of service training at customer sites for telemetry and use AR during hands-on training to enhance the learning experience. Furthermore, AR training applications allow engineers to review and practice techniques in their homes before performing actual repairs.

Eventually, VR and AR could replace training documentation as we know it today, and for a fraction of the cost, build effective and interactive guides.

The integration of VR and AR, along with advances in artificial intelligence, have the potential to transform clinical service and other roles in healthcare. VR and AR can radically enhance service quality and efficiency for manufacturer and in-house personnel. They can help drive excellence from installation, to repairs, to clinical practice. Care providers and device suppliers who embrace these tools stand to benefit greatly.

About the author: Art Larson is general manager of Global Services Education with GE Healthcare.

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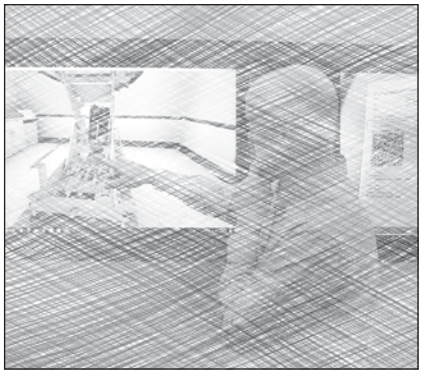

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