The health IT world will converge at HIMSS 2019

Exclusive Q&A with Christopher Ross, Chair of HIMSS North America Board of Directors

p. 70

Also in our AI issue

ARTIFICIAL INTELLIGENCE IS HERE, NOW WHAT?
• A look at the current landscape and future trajectory for artificial intelligence in healthcare. p 44

GETTING WHAT YOU NEED FROM RIS
• What will the right radiology information system (RIS) bring to your imaging department? p 56

PACS AND OPINIONS
• Upgrading imaging IT is a notoriously complicated process. We talk to analysts and providers to find out what tips they have for making the transition as smooth as possible, and what factors are driving the decision-making process. p 62

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EXCLUSIVE Q&As

22
Q&A with Dr. Daniel Mitchell
Discussing technology and culture with the medical director of diagnostic imaging at Vermont’s second largest hospital, Rutland Regional.

28
Q&A with Lorenzo Derchi
The president of the ESR shares insight on what to expect at this year’s European Congress of Radiology and what it means to bring harmony to imaging in Europe.

38
Q&A with Paul Schulz
We speak to the healthcare consulting manager at Eide Bailly to find out what it takes for a hospital to successfully implement an RTLS system.

42
Q&A with Ian Watts
Addressing into augmented reality’s potential in medicine with the University of Alberta computing science grad student and developer of ProjectDR.

51
Q&A with Dr. John Halamka
Demystifying the potential of blockchain to improve data management in healthcare by discussing it with one of the top leading experts.

52
Q&A with Dr. David Asch
The executive director of the Penn Medicine Center for Health Care Innovation talks about efforts to make EHRs a more seamless part of workflow.

70
Q&A with Christopher Ross
The chair of HIMSS North America Board of Directors discusses his background and some of the hot topics that will dominate conversation at the premier event in health IT.

FEATURES

40
Is medical 3D printing destined to become as commonplace as X-ray?
Dr. Beth Ripley draws comparisons between the advent of radiology and the arrival of 3D printing, and discusses how a diverse team approach may help unlock 3D printing’s full potential.

44
Artificial intelligence is here, now what?
A look at the current landscape and future trajectory for artificial intelligence in healthcare.

56
Getting what you need from RIS
What will the right radiology information system (RIS) bring to your imaging department?

62
PACS and opinions
Upgrading imaging IT is a notoriously complicated process. We talk to analysts and providers to find out what tips they have for making the transition as smooth as possible, and what factors are driving the decision-making process.

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  - Mobile Storage (Under Power)
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- Turnkey Projects

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COLUMNS & SECTIONS

8 Daily News Round-Up
Some of the top current events stories from our Daily News online

19 Upcoming Events
Mark your calendar for these medical industry conferences and meetings

20 Hospital Spotlight
Behind the scenes at Rutland Regional Medical Center

24 IT Matters
Discussing AI's evolving role in radiology with NYU Langone's Dr. Michael Recht

26 Cost Containment Corner
Who gets your vote for data governance? Insights from Rob Barras, VP of Healthcare for CTG

27 Purchasing Insights
The experts at MD Buyline share advice for providers entering the imaging IT marketplace

36 Current Events in European Radiology
A quick recap of some of the biggest imaging industry headlines from recent months

50 Clinical Workflow
Dr. Jamshid (Jim) Tehranzadeh and Nasser Hiekali discuss how AI and personalized medicine can raise the bar in radiology reporting

54 Forward Thinking
Mark Tomaino provides top level insights on the state of health IT and how integration will allow value-based care to take flight

60 Cybersecurity
How Moffitt Cancer Center secured its radiology systems by ditching anti-virus software

61 Sound Insights
The researchers at Reaction Data provide an update on the speech recognition market
Letter from the Editor

Of artificial intelligence and ’92 Buick LeSabres

The latest and most sophisticated technology is usually pretty far removed from the average patient’s medical experience. My own annual checkups often serve as a sobering reminder that smaller, local healthcare providers simply do not have money to invest in brand new, top-of-the-line solutions. As a journalist covering health tech it is sometimes easy to forget that although super-powerful MR magnets (to pick a random example) can raise the bar on our understanding of human anatomy, they don’t always have real world applications for people outside of the academic community.

If value-based care is anything, it is a reminder for hospitals to be frugal and invest their money in things that will yield measurable results. Maybe that is why artificial intelligence seems different from everything else… there is something democratizing about tools that process large pools of data for better decision-making… or at least there should be. To make a sort of half-hearted analogy, AI is less like a luxury automobile and more like GPS. Whether you drive a brand new BMW or a 1992 Buick LeSabre with manual windows, GPS has probably changed the way you get around.

Of course, technology in the medical industry faces unique challenges. Cris Ross, chairman of HIMSS, sums it up in his interview on page 70. “Given the complexity of our industry, for most of us, it’s a constant is that it has always benefited from a close relationship between technology and the human knowledge and expertise, and I am convinced that this will not change in the future,” he said.

On that note, I hope you enjoy this first ever AI-themed issue of HealthCare Business News magazine. Thanks for reading.

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Merry X-Ray acquires Conquest Imaging

Merry X-Ray (MXR) has been acquiring its competition steadily over the last few years and it is now adding California-based Conquest Imaging to the fold.

Conquest Imaging is an ISO 9001:2015 certified ultrasound repair company that was founded in 2000 by Mark and Jean Conrad, to provide high-quality third-party service in the western U.S. When the company started, Mark already had 15 years of experience on Acuson/Siemens ultrasound systems and that expertise served the company and helped it grow.

“We are thrilled to add Conquest’s capabilities to our portfolio of products,” Ted Sloan, president of Merry X-Ray, said in a statement. “This continues our momentum in offering top level service and support for all diagnostic imaging systems.”

Conquest Imaging released its own statement, stressing that the acquisition would not negatively impact their existing customer base. Service customers will still call the same number for service, parts, probes and parts. The difference is that Conquest Imaging will now be able to offer hospitals MXR’s vast products and capabilities.

“I am excited to join Merry X-Ray’s collection of medical device companies,” stated Mark Conrad, co-founder of Conquest Imaging, who will remain with the newly expanded company. “I can finally realize my dream of entering into multiple modalities and providing nationwide service.”

Over the last several years MXR has absorbed the talents and assets of numerous third-party parts and service companies, including Medical Digital Imaging of Texas, Integrated X-Ray, Wolverine X-Ray, Lupica Medical Systems and All Stay X-Ray just to name a few.

The addition of Conquest Imaging is expected to allow MXR to further increase savings for healthcare facilities by decreasing parts and service costs.

In October of 2017, the company acquired Consensys Imaging Service in an agreement that expanded its presence in CT, MR and other imaging modality markets. It also provided cost-saving measures, such as Consensys’ scalable service model, which can absorb existing service needs.

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Corrections to our previous issue
We have been made aware of three incorrect statements in our Nov/Dec print issue:

On page 32, in our Q&A with Patrick Flaherty, vice president of operations for BioTronics at UPMC, we incorrectly quoted him as saying “we think it’s a better plan for IT to be under supply chain” when in fact he said “we think it’s a better plan for BioTronics to be under supply chain.”

On page 42, in the article “From the frontlines to the frontier: CT trends and innovations” we wrote that the photoacoustic CT developed by Lihong Wang and fellow researchers at Caltech could locate breast tumors in as little as 15 minutes when in fact it can do this in 15 seconds.

On page 51, in the article “Implants, gadolinium and AI: changing perceptions in MR” we wrote that the Columbia MR Research Center was at Columbia University’s Zuckerman Institute. It is actually a multi-site center that includes the Zuckerman Institute as one of its locations.

We regret any confusion these errors may have caused and have corrected them in all digital versions of the magazine.

Top trending headlines as we went to print:

   dotmed.com/news/45742

2. The biggest proton therapy stories of 2018
   dotmed.com/news/45743

3. New MR to perform hi-res brain scans in 15 minutes or less
   dotmed.com/news/45777

4. Philips kicks off new year with realigned business segments
   dotmed.com/news/45862

5. Top molecular imaging stories of 2018
   dotmed.com/news/45744

6. Bayer closing Pittsburgh operations to consolidate company
   dotmed.com/news/45910

7. Cross-matching mammo exams with treatment data sets yields large-scale insight
   dotmed.com/news/45780

8. FDA clears United Imaging’s total-body PET scanner
   dotmed.com/news/45978

9. Siemens Healthineers and CLS ink deal to connect products
   dotmed.com/news/45832

10. New ultrasound sensor 100 times more sensitive than conventional ones
    dotmed.com/news/45912

11. Three healthcare IT trends to watch in 2019
    dotmed.com/news/45847

12. Healthcare investment booming in Richmond, Virginia area
    dotmed.com/news/45879

13. FDA extends deadline for device servicing docket comments
    dotmed.com/news/45940

14. Shimadzu Medical Systems USA acquires Core Medical Imaging
    dotmed.com/news/45795

15. Olympus promotes U.S.-Based leaders to global roles
    dotmed.com/news/45865

Visit HCB Daily News online for breaking stories every day.
**Absolute Medical Imaging: A new name in imaging but no shortage of experience**

*Posted online December 20, 2018 by Gus Iversen*

With a focus on mobile imaging, refurbished imaging equipment and engineering services, a new company called Absolute Medical Imaging is setting out to stake its claim in the market. The three business partners – Jordan Brinker, Will Hengemuhle and John Vartanian – believe they are uniquely qualified to succeed in the industry.

Vartanian, who used his background in engineering to build Medical Imaging Resources (MIR), which he owned and operated for 23 years prior to selling it in 2015, says the team’s diverse backgrounds will be an asset to delivering quality and affordability to their customers.

Brinker also comes from MIR, where he ran the mobile MR/CT division while gaining customers throughout the entire U.S. over the last 15 years. Hengemuhle has an entrepreneurial background and grew a business in the southeast that concentrated on end-user radiology equipment and MR/CT sales.

“There is a huge technology deficit in the mobile imaging portion of our industry,” said Brinker. “Healthcare providers are always looking for value, some through technology, and others through price points. Absolute Medical Imaging stands ready to meet all the needs whether it’s price, technology, or our outstanding service and expertise.”

According to Hengemuhle, attention to customers is what will ultimately set Absolute Medical Imaging apart from the rest. “We make sure not to cut corners in anything that we do, from building a mobile to managing fixed-site projects, to dispatching service to our customers,” he said.

The company put similar attention to detail into the building of their team. “Our engineers certainly have specialties, and we have made sure to diversify our knowledge-base across manufactures and modalities,” said Hengemuhle, “but they are also cross-trained on multiple manufactures and modalities in order to provide efficiency and savings to our customers.”

Absolute Medical Imaging operates nationwide for mobile imaging and fixed site equipment sales, and has maintenance service clusters from Texas to the East Coast, added Brinker.

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**FDA greenlights EhmetDx software for use at Michigan proton therapy facility**

*Posted online December 17, 2018 by John R. Fischer*

Treatments at the McLaren Proton Therapy Center in Flint, Michigan are expected to be more precise following the FDA’s clearance of a 3D CBCT positioning software produced by EhmetDx for use at the facility.

The system is designed to sharply guide the position of proton beams during treatments, which are set to begin at the Michigan facility this month.

“We look forward toward patient treatment using our software for positioning now that the FDA concluded that our X-ray positioning system has met the requirements needed for 510(k),” Michael Teicher, founder and CEO of EhmetDx, said in a statement.

The FDA’s approval will also allow EhmetDx to focus more on the commercialization of its Mammoknife, the first self-shielded, linac-based breast cancer radiotherapy device.

The system is expected to raise the standard of treatment for women and bring care to a broader range of patients based on its ability to be housed in any treatment center or medical office without the need for additional and expensive shielding or bunkers.

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**New technique could reduce dose exposure during 3D X-ray exams**

*Posted online December 18, 2018 by John R. Fischer*

A collaboration spanning both hemispheres has uncovered a new way to reduce the amount of exposure that patients are subjected to under 3D X-ray medical scanning.

Working alongside the European Synchrotron Radiation Facility, researchers at Australian National University and Monash University found that using a technique called ghost imaging could enable scientists to retrieve 3D X-ray images of the interior of objects that are opaque to visible light, with only the total X-ray transmission measured by a single sensor. The teams say that a variation of the approach could require only a sensor rather an X-ray camera.

“Because of the potential for significantly lower doses of X-rays with 3D ghost imaging, this approach could revolutionize medical imaging by making X-ray screening for early signs of disease much cheaper, more readily available, and able to be undertaken much more often,” Dr. David Paganin, a physicist at Monash University in Australia and the senior author of the research paper behind the finding, said in a statement. “This would greatly improve early detection of diseases, including cancers.”

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Objects in MR room responsible for a quarter of MR screening events, says study

Posted online December 27, 2018 by John R. Fischer

More than a quarter of MR screening events – scenarios with the potential for setting off adverse events – are caused by the presence of external and internal objects or devices inside the scanner room.

That’s the finding made by the Pennsylvania Patient Safety Authority which identified more than 1,100 such events submitted to the Pennsylvania Patient Safety Reporting System between 2009 and 2017.

“With the advancement of medical technology, the number of patients with external or internal medical devices is increasing, and care within the MR environment is changing,” Cynthia Field, senior patient safety analyst for the Pennsylvania Patient Safety Authority, told HCB News. “More complex procedures are being done with MR guidance, often requiring more equipment to support the patient. These changes increase the potential risk for ferromagnetic devices entering the MR suite and highlight the need for continued awareness and focus on MR screening.”

Screening events refer to scenarios in which patients were not harmed during scans despite the presence of risk factors, such as ferromagnetic devices, in the MR system. Such events signify a lack of understanding of the potential risks and protocols necessary for safety during exams.

In their initial assessment, researchers identified 1,448 events that consisted of errors related to the procedure/treatment/test, but excluded 340 related to factors such as adverse reactions to contrast; wrong site and scheduling issues; exams outside of MR; changes in patient’s clinical status; intravenous infiltrations and extravasations; incorrect results; patient injury caused by unintended physical contact with MR equipment; and the inability to complete a study due to specific patient factors.

Of the remaining 1,108 events identified, 607 involved the presence of internal medical devices, the most common of which were pacemakers at 353, while 187 were due to external solutions. One hundred and one events involved internal non-medical objects such as metal artifacts or tattoos, and 198 were external non-medical objects.

The findings were published in the journal Advisory.

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Elekta Unity MR-linac gains FDA 510(k) clearance

Posted online December 06, 2018 by Thomas Dworetzky

The Elekta Unity magnetic resonance radiation therapy (MR/RT) system has gotten its FDA 510(k) premarket notification and is now ready for sale and clinical use in the U.S.

“Since receiving CE mark in June 2018, Elekta Unity has been transforming the care of cancer patients in Europe, and we are excited that this cutting-edge technology is now commercially available to U.S. patients,” Elekta president and CEO Richard Hausmann said in a statement, adding that the Unity will make possible the development of personalized, precision radiation therapy regimens optimized for safety and efficacy.

Hausmann also acknowledged the researchers involved in the MR-linac consortium and MR technology partner, Royal Philips.

“Unity is a tremendous leap forward in our ability to tailor radiation therapy to each patient’s tumor and anatomy, and to adapt treatment in real time as the tumor changes shape and position relative to organs at risk,” said Dr. Christopher Schultz, chair of the Elekta MR-linac Consortium.

He called the new technology “fundamentally” transformational in terms of the development and implementation of therapy regimens.

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Penn Medicine launches brain tumor telemedicine program

Posted online December 26, 2018 by John R. Fischer

Penn Medicine is opening the virtual doors to its expertise for brain tumor assessment with the launch of a new telemedicine program.

Deeming the initiative a “second opinion program,” the Penn Brain Tumor Center is offering up its team of physicians as a source of review focused solely on the diagnosis and treatment of benign and malignant brain tumors, as part of the first phase of the program.

“Receiving a brain tumor diagnosis is a life-changing event and it can be particularly difficult when facing multiple treatment choices,” Steven Brem, co-director of the Brain Tumor Center and director of Neurosurgical Oncology, said in a statement. “Thanks to the power of telemedicine, we can provide second opinions to eligible patients, without travel, helping patients and caregivers understand their diagnosis and make the right choice for a treatment plan that’s best for them.”

The program will be rolled out in phases, and will initially be offered to patients in Florida, Georgia, Maryland, North Carolina, Pennsylvania, South Carolina, Virginia and Washington, D.C., with the Penn hoping to expand its reach throughout the next year.

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Researchers aim to improve flash therapy

Posted online December 13, 2018 by Thomas Dworetzky

Dramatic cuts to cancer treatment times – and making treatment technology more compact – got a boost from new funding for two accelerator-based projects; one using X-rays, the other using protons, now in the works by the Department of Energy’s SLAC National Accelerator Laboratory and Stanford University.

The PHASER X-ray project uses “rapidly scanned beams from many directions through electromagnetic steering with no mechanical moving parts, and is referred to as pluridirectional high-energy agile scanning electron radiotherapy,” according to a Stanford report on the work. It is designed to create a flash delivery system able to slash radiation times to under a second from minutes, as well as devising compact technology that can make advanced radiation therapy available more widely.

The new funding includes a $1.7 million grant from the DOE Office of Science Accelerator Stewardship program to develop the technology over the next three years. In addition, the Stanford Department of Radiation Oncology is putting in approximately $1 million over the next year to support the work. Along with the School of Medicine, it has also set up the Radiation Science Center, of which the PHASER project is a division.

“Delivering the radiation dose of an entire therapy session with a single flash lasting less than a second would be the ultimate way of managing the constant motion of organs and tissues, and a major advance compared with methods we’re using today,” said Billy Loo, an associate professor of radiation oncology at the Stanford School of Medicine.

To deliver such high-intensity radiation this efficiently, noted chief scientist for the RF Accelerator Research Division in SLAC’s Technology Innovation Directorate, Sami Tantawi, “we need accelerator structures that are hundreds of times more powerful than today’s technology.”

Another goal of the researchers is to devise innovative ways to manipulate proton beams that will make future devices simpler, more compact and much faster, according to SLAC staff scientist Emilio Nanni, who leads the project with Tantawi and Loo, adding that thanks to the DOE grant, “we can now move forward with designing, fabricating and testing an accelerator structure, similar to the one in the PHASER project, that will be capable of steering the proton beam, tuning its energy and delivering high radiation doses practically instantaneously.”

The hope is that the PHASER work could then lead to proton devices able to fit into a standard shipping container – allowing the approach to be used more widely around the globe.

Share this story: dotmed.com/news/45629
GE files confidentially for healthcare IPO: report

GE has filed confidentially for an initial public offering of its healthcare unit, according to new reports citing unnamed sources.

Goldman Sachs Group Inc., Bank of America Corp., Citigroup Inc., JPMorgan Chase & Co., and Morgan Stanley are all working with GE on the planned listing, said the people, who asked not to be identified as the details aren’t public, according to Bloomberg, which broke the news.

A public filing is likely next spring, the sources said.

When reached for comment, GE Healthcare stressed that it was not confirming details at this time.

“As we announced in June, GE intends to separate its Healthcare business, but we have not confirmed the form or timing,” a spokesperson told HCB News. “As an independent global healthcare business, GE Healthcare will have greater flexibility to pursue future growth opportunities, react quickly to changes in the industry, and invest in innovation.”

Shares surged on Wednesday by more than 8 percent and analysts warned to General Electric after what has been a turbulent year for the company.

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Olympus Medical Systems takes guilty plea deal in scope case

Olympus Corporation subsidiary Olympus Medical Systems has reached a final plea deal with the U.S. Department of Justice over its errors filing and supplementing Medical Device Reports for its TJF-Q180V duodenoscopes concerning infections linked to the device, and to selling the device during that period.

The company, in a statement, “acknowledged that it failed to submit two required supplemental MDRs and one initial MDR” to the FDA over the problems with the devices that led to a rash of patient illnesses from 2012 to 2014, some of which proved fatal.

Olympus Medical has pleaded guilty to three criminal misdemeanors and will pay $80 million in fines and $5 million in forfeitures. In addition it will enhance how it handles regulatory affairs processes and procedures, and will make regular certifications that the company is living up to the settlement deal.

The company also stated that the investigation did not uncover “any direct harm to patients as a result of the disclosure failures,” it stated, while admitting to failure to meet federal reporting requirements.

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NYU releases biggest ever MR data set in AI Facebook collaboration

MR scans could soon be done 10 times faster, thanks to a a large-scale MR dataset just released to the public from fastMRI, a collaboration between Facebook AI Research and NYU Langone’s Department of Radiology.

“We hope that the release of this landmark data set, the largest-ever collection of fully-sampled MR raw data, will provide researchers with the tools necessary to overcome the challenges inherent in accelerating MR imaging,” Dr. Michael P. Recht, chair and the Louis Marx Professor of Radiology at NYU Langone said in a statement following his announcement of the news in a plenary address at the 2018 annual meeting of the Radiological Society of North America (RSNA).

Recht also shared baseline results from the collaboration, made up of 1.5 million MR images of the knee from 10,000 scans, plus raw measurement data from almost 1,600 scans. The collaboration demonstrates that acceleration of MR imaging by a factor of four “is already possible”.

The data set is fully anonymized, HIPAA-compliant information from NYU’s medical school – and no Facebook data. Future releases will add data from liver and brain scans.

In addition, the open source tool is expected to boost the development of AI systems that are capable of deciphering MR scans, boost research reproducibility, and open the door for more consistent evaluation methods. Plans call for the collaboration to develop a suite of tools and baseline metrics to compare results in an organized challenge that will be announced “in the near future,” according to the NYU report.

“This collaboration focuses on applying the strengths of machine learning to reconstruct high-value images in new ways. Rather than using existing images to train AI algorithms, we will radically change the way medical images are acquired in the first place,” Dr. Daniel K. Sodickson, director of NYU’s Center for Advanced Imaging Innovation and Research, added in a statement. “Our aim is not merely to enhance data mining with AI, but rather create new capabilities for medical visualization, to benefit human health.”

Share this story: dotmed.com/news/45521
Spectrum Dynamics files lawsuit against GE

Posted online December 06, 2018 by John R. Fischer

Spectrum Dynamics is taking GE to court over allegations of theft and misappropriation of trade secrets and intellectual property, related to the development of proprietary technology for SPECT imaging.

Filed in the U.S. District Court for the Southern District of New York, the suit accuses the tech giant of stealing and using Spectrum Dynamics’ trade secrets to develop and file a patent related to technology and design of what would become its VERITON/VERITON-CT, the first multi-purpose, 12-detector SPECT system that delivers 360-degree, full-body contour scanning to produce 3D coronary, bone and neuro images.

“By stealing Spectrum Dynamics’ inventions, GE avoided years of its own R&D efforts and considerable expense in an effort to hasten the development of its own directly competing device,” Michael Joos, president and CEO of Spectrum Dynamics, said in a statement. “GE sought a shortcut to a technology that its own engineers were unable to develop. GE had no right to patent and produce technology it stole and should be prevented from going to market with it.”

Launched in June at SNMMI, Spectrum Dynamic’s 12-detector scanner is the first and only technically optimized solution that enables broad-based transition from analog to digital within the SPECT imaging equipment market. It is predicted to offer an assortment of benefits, including improved clinical patient outcomes and reduced costs for hospitals and healthcare systems.

With its lawsuit, Spectrum Dynamics hopes to block GE from developing, commercializing and using in any other way the trade secrets and ideas it is alleged to have stolen.

The company is also claiming unfair competition and seeking corrections to “inventorship” on GE patents that lay claim to Spectrum Dynamics inventions, as well as constructive ownership of the GE patents. Additionally, it seeks preliminary and permanent injunctive relief to prevent GE from continuing to exploit its intellectual property.

“The technology and knowledge that Spectrum Dynamics pioneered are incredibly valuable, as they bring the benefits of broad digital adoption to SPECT imaging, driving improved clinical patient outcomes and reduced costs for hospitals,” said Joos in his statement. “While it is regrettable that we are forced to file a lawsuit against GE, we were left with no choice. As a pioneer in full-body digital nuclear imaging systems, we will aggressively defend our inventions against these illegal actions by GE.”

In response, GE told HCB News that it “observes and respects intellectual property rights, and denies these allegations.”

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US Radiology Specialists partners with Touchstone Medical Imaging

Posted online December 28, 2018 by John R. Fischer

US Radiology Specialists expanded its reach earlier this month by partnering with Touchstone Medical Imaging, an outpatient imaging provider that offers services in MR, CT, ultrasound, X-ray and women’s imaging.

The collaboration opens up opportunities for the physician-owned radiology group, providing it access to resources from Touchstone’s 1,000 employees at its 60 outpatient imaging centers across Texas, Colorado, Oklahoma, Florida, Nebraska, Arkansas and Montana.

“We are excited that Touchstone has decided to join the US Radiology team,” US Radiology CEO John Perkins said in a statement. “We share the same commitment to providing the highest level of care to patients in the outpatient setting by partnering with top-notch subspecialized radiologists and leading health systems partners.”

Formed back in April through a partnership between Charlotte Radiology and Welsh, Carson, Anderson & Stowe, US Radiology has experienced a 300 percent growth rate in less than a year, building up an organization comprising 200 subspecialized radiology and physician assistants who conduct over 3.5 million annual reads and scans across 30 hospitals and 80 outpatient imaging centers in nine states.

Share this story: dotmed.com/news/45725
Many outpatient imaging providers unprepared for new AU rules launching in a year

Posted online December 04, 2018 by John W. Mitchell

CMS published new rules for Appropriate Use (AU) measures that will target the top five percent of physicians ordering imaging tests without citing proper criteria.

Most outpatient imaging centers have done very little to prepare for the change going into effect January 1, 2020, according to survey results presented by Melody Mulaik, president of Coding Strategies Inc. (CSI), a company that specializes in multispecialty coding and compliance education. She shared the information at an RSNA session in Chicago.

While Mulaik said the first year would serve as a grace period for physicians to adjust to citing CMS approved AU criteria sources, the top five percent identified in the data can expect oversight measures going into the second year. The goal of the rules is to better control CMS spending for advanced outpatient imaging modalities such as CT, MR, and nuclear medicine (including PET).

Mulaik conducted a quick online survey among the RSNA audience. It revealed that 38 percent of the audience, comprising about 40 percent of administrators, have done nothing to prepare for the new AU rule. Further, 42 percent had just started working and expect the effort to take at least nine months. Only eight percent of the respondents said their operational changes were fully implemented.

These RSNA results were also reflected in a survey conducted by the Association for Medical Imaging Management earlier this year. Of nearly 300 respondents, 66 percent reported that no AU implementation had occurred.

Mulaik cautioned that the new AU documentation could be troublesome. This is because the measures must be incorporated into the existing workflow. Further, linking the change to the chargemaster is not the best option. Such a link could result in a facility having as many as four separate billing codes for the same procedure. Also, the fact that many outpatient operations still rely heavily on paper orders could set the stage for AU confusion and noncompliance.

“When you talk to the government,” said Mulaik. “They don’t understand all the moving parts.”

Digital mammo increases cancer detection with no change in recall rates

Posted online December 18, 2018 by Lisa Chamoff

A retrospective study out of the U.K. has found that digital mammography increased overall cancer detection rate by 14 percent with no change in recall rates.

The study, posted online this month in the journal Radiology, also found a “substantially higher” detection of grade 1 and 2 early-stage, invasive cancers, including both ductal and lobular cancers, with digital mammography.

The researchers analyzed annual screening data from the 80 facilities involved in the English National Health Service Breast Cancer Screening Program – which has been running for nearly 30 years and is now fully digital – combined with estimates of digital mammography usage. Overall, they were able to look at 11.3 million screening exams performed on women between the ages of 45 and 70.

“It was from this data set that the change with digital became apparent, and we decided to publish it, as it is such robust data and not confounded by other factors changing over the time period of the study,” Dr. Rosalind Given-Wilson, a radiologist at St. Georges University Hospitals NHS Foundation Trust in London and a co-author, told HCB News.

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Chinese researchers to develop 14 Tesla MR scanner for brain

Posted online December 24, 2018 by John R. Fischer

Researchers in China are mapping out a plan to construct a 14-Tesla MR scanner dedicated to the study of the brain.

The aim is to build a scanner capable of exerting a magnetic field strong enough to show for the first time the structure and activities of every neuron in a living human brain, enabling clinicians to assess the consciousness and brain-related diseases.

“It will show us a different world with phenomenon unseen before ... maybe even the soul,” a senior scientist told the South China Morning Post, using the term “soul” to refer to the theoretical human consciousness, the existence of which has long been debated within the scientific community.

Typical medical MR scanners generate 1.5 or 3.0 Tesla, though ones that generate up to 7 Tesla have also been cleared for use. A system as powerful as 10.5 Tesla was used back in March at the University of Minnesota to perform human scans. These systems can only resonate hydrogen nuclei.

The development of a 14 Tesla scanner, however, would be able to exert a magnetic field strong enough to stimulate the nuclei of heavier elements, with researchers envisioning the billion-yuan device to be able to track various types of chemical agents including sodium, phosphorus and potassium, all of which pass critical signals along neural fiber networks that are indicative of activities associated with the consciousness and the impact of conditions such as Parkinson’s and Alzheimer’s.

“If we can make these elements resonate in the same manner as the hydrogen, the information we obtain will increase like ‘boom, boom, boom’,” said a Beijing-based physicist involved in the project. “We may, for the first time, capture a full picture of human consciousness or even the essence of life itself. Then we can define them and explain how they work in precise physical terms – just like Newton and Einstein defined and explained the universe.”

The project is based in the city of Shenzhen in Guangdong province.

IBA to install Proteus ONE compact proton system in Belgium

Posted online December 31, 2018 by John R. Fischer

Proton therapy manufacturer Ion Beam Applications S.A. is set to install a new proton therapy solution for a contract estimated to be worth between $28,616,400 (€25 million) and $34,339,680 (€30 million).

Under orders from the Free University of Brussels, the University of Liège, the University of Mons and the University of Namur, the Belgian-based provider will begin the installation process of its Proteus ONE compact proton therapy solution in Charleroi, located in the Wallonia Region of Belgium. The Walloon Government confirmed its obtainment of financing for the project earlier this month, with a full down payment expected to be delivered to IBA soon.

IBA was selected as the preferred vendor in February 2017 following a comprehensive European public tender process. The agreement includes the supply of equipment and a service contract with IBA, as well as research program collaborations with the four universities. In addition, the Catholic University of Louvain will participate in complementary research programs with the four too.

The installation of the compact single-room solution will be the second carried out by IBA in Belgium and its 25th overall.

Share this story: dotmed.com/news/45727
New VR app may ease MR anxiety

Posted online December 10, 2018 by Thomas Dworetzky

MR is a great tool, but the need to stay still in a tight space for a relatively long time can make it a challenge for some patients.

Now, a new virtual reality application developed by the University of Michigan’s department of radiology and the Duderstadt Center’s Emerging Technologies Group lets those awaiting a scan “experience” the procedure anywhere – and in the process, helps them prepare in advance to ease tension and reduce fears.

“The app allows patients to fully experience the sensation of being inside of a scanner,” Daniel Fessahazion, associate director of the Emerging Technologies Group, said in a UM report on the application. “As a patient turns their head or moves their body, they can see the room around them while the system detects their motion and provides them with the illusion that they are inside the MR.”

The researchers observed that there is often a need for such desensitization after having to stop scans prematurely for about 1.6 percent of patients due to claustrophobia or discomfort, finding that a significant proportion required conscious sedation to undergo the entire scanning procedure, according to their report in the journal, Tomography.

They also noted that nurse-assisted conscious sedation could range from 3.8 percent to as much as 14.3 percent of procedures in some institutions.

“The goal is to decrease [the patient’s] anxiety about the procedure,” said Dr. Richard K.J. Brown, a professor of radiology at the University of Michigan, and project leader.

Using the application can transform an area in one’s home into a virtual MR scanning room, complete with sounds of the device recorded on-site during a real-life simulation in order to make the experience as lifelike as possible.

The developers also utilized programming tools to create video games to help patients understand scanning protocols in a fun way. In addition to reducing anxiety around procedures, the hope is that the app will help to cut down the need for sedation.

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3M to acquire M*Modal technology business for $1 billion

Posted online December 20, 2018 by John R. Fischer

3M is set to acquire the technology business of M*Modal, a provider of cloud-based, conversational AI-powered systems, for $1 billion.

The Minnesota-based manufacturer seeks to use M*Modal’s technology and resources to strengthen its revenue cycle management and population health priority growth platform, as well as build up the progress of its Health Information Systems business, which works with more than 8,000 healthcare providers and payers worldwide to deliver software and services.

“Together, we will enable doctors to improve the patient experience, while enhancing documentation accuracy and operational efficiency for both providers and payers,” Mike Vale, executive vice president of 3M Health Care Business Group, said in a statement.

The acquisition follows a number of milestones for 3M this year, including the recent FDA clearance of its 3M Attest Super Rapid Biological Indicator (BI) System for Steam, which provides BI test results in just 24 minutes, and the introduction of its single-patient stethoscopes for patients in isolation to prevent the transmission of infectious diseases.

Annual revenue of M*Modal’s technology business is estimated to be approximately $200 million.

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Johns Hopkins Medicine teams selects Nuance to reduce clinician burnout

Posted online December 21, 2018 by John R. Fischer

Johns Hopkins Medicine has selected Nuance Communications to supply AI solutions for the advancement of “Joy at Johns Hopkins Medicine”.

A multi-year initiative for helping to reduce clinician and caregiver burnout, the program will now be equipped with Dragon Medical One and Dragon Medical Advisor, Nuance’s AI-powered clinical documentation systems for easing the documentation burden.

“Through Dragon Medical One and Dragon Medical Advisor, Nuance helps foster greater physician productivity and satisfaction, improves quality metrics for reporting and maximizes physician-patient interactions by easing the documentation burden on physicians,” Michael Clark, senior vice president and general manager of provider solutions at Nuance, told HCB news.

“Ultimately, the solutions allow clinicians to spend more time on what matters most — taking care of patients.”

About 51 percent of physicians felt burned out in 2017, a more than 40 percent increase from 2013, according to Medicare’s annual survey. Much of this feeling can be chalked up to stress from daily administrative tasks, with half of a physician’s day typically consumed by data entry, and only 27 percent of their time available to spend with patients.

The Joy in Medicine Task Force seeks to reduce this issue for clinicians by adopting support systems that can help them achieve professional goals and maximize their engagement with patients.

The Joy in Medicine Task Force seeks to reduce this issue for clinicians by adopting support systems that can help them achieve professional goals and maximize their engagement with patients.

A HITRUST CSF-certified healthcare speech recognition platform hosted on Microsoft Azure, Dragon Medical One enables physicians to dictate patient stories from anywhere at any time, allowing them to interact more with their patients and reducing manual workload.

Dragon Medical Advisor is an in-workflow computer-assisted physician documentation (CAPD) solution that provides real-time advice to clinicians on the specificity of diagnoses so that encounters can be properly coded to accelerate billing, reduce denials and improve risk adjustment. The system’s enterprise-wide agreement also included Dragon Medical embedded in Epic Haiku and Canto to further optimize Johns Hopkins’ Medical EHR and provide dictation options for clinicians on the move, and PowerMic Mobile for increased documentation mobility through a secure wireless microphone app.

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Obese patients at increased risk for cancer due to higher X-ray doses, says study

Posted online December 26, 2018 by John R. Fischer

Patients who are extremely obese are in need of higher doses of radiation during X-ray exams, putting them at greater risk of developing cancer.

That’s the claim made in a new study by researchers at the University of Exeter and Musgrove Park Hospital in Taunton, U.K., who are calling for greater research on how to determine proper dose rates for patients who are overweight and obese.

“Our findings highlight the implications of increased radiation doses in severely obese patients,” Karen Knapp, associate professor of musculoskeletal imaging at the University of Exeter, who oversaw the study, said in a statement. “Although the risk of cancer from X-ray is very low, we urgently need more research in patients who are overweight and obese, so we can understand how to minimize doses in this group and feed into far more robust guidelines around radiation, in turn to minimize that risk.”

Although the team found the overall risk of cancer to be more than double that of people with normal weights, the risk of cancer from X-rays was found to be low.

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FDA proposes 510(k) process changes

Posted online December 03, 2018 by Thomas Dworetzky

There could be changes coming to the 510(k) expedited approval process used by the Food and Drug Administration to OK medical devices.

This process lets device makers compare a new device to older ones if they can show that it’s “at least as safe and effective” as something already approved. It also means that the new devices may well be measured against very old technology — known as “predicate devices.”

The agency now wished to end the use of these present predicates, but also make it easier to introduce new ones, FDA Commissioner Scott Gottlieb and Center for Devices and Radiological Health Director Jeff Shuren said in a statement.

“What we want to do is constantly push the market toward incorporating better technology and better capabilities by advancing the predicates and always looking forward so the ... predicates the device companies are using as the basis of their approvals are constantly incorporating newer and better technology to make the devices better and safer,” Gottlieb said Monday in an interview with CNBC’s Becky Quick.

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Upcoming Events

HIMSS 2019 – Global Conference & Exhibition
Location: Orange County Convention Center, Orlando, FL
Dates: February 11-15
Years in Existence: 56
Average attendance: 45,000+
Who should attend: C-Suite, consultants, govt. or public policy professionals, health care finance professionals, IT professionals, physicians, project managers.

ACE Summit and Reverse Expo 2019
Location: Westin Peachtree Plaza, Atlanta, GA
Dates: February 18-20
Years in Existence: 6
Average attendance: 600-700

ECR 2019 – European Society of Radiology
Location: Austria Center Vienna, Vienna, Austria
Dates: February 27- March 3
Years in Existence: 51
Average attendance: 25,000+
Who should attend: Radiologists, radiographers, surgeons, oncologists, technologists.

NAPT 2019 – National Association for Proton Therapy
Location: The Biltmore Miami-Coral Gables, Coral Gables, FL
Dates: March 24-27
Years in Existence: 7
Average attendance: 300+
Who should attend: Physicians, administrators, physicists, nurses, payers, benefit managers, attorneys, vendors, developers, contractors, financiers.

AMGA 2019 Annual Conference
Location: Gaylord National Resort & Convention Center, National Harbor, MD (Washington DC metro area)
Dates: March 27-30
Years in Existence: 70
Average attendance: 2,000+
Who should attend: Medical group and health system executives directly responsible and accountable for the success of their organizations.

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Rutland Regional Medical Center

Location: Rutland, Vermont
Year founded: 1896
Number of beds: 144
Number of employees: 1,734
President and CEO: Claudio Fort
**Noteworthy distinctions:** Rutland Regional Medical Center is Vermont’s biggest community hospital and the state’s second largest. They have 37 specialty clinics, and 277 medical staff treating over 250,000 patients annually. For the second year in a row, RRMC is the only hospital in Vermont to be named a “Best Regional Hospital” by *US News & World Report* for 2018-2019. They were also recognized by Healthgrades as among the top 10 percent in the nation, and the only hospital in Vermont for joint replacement and 5-star recipients for total knee replacement, total hip replacement and treatment of chronic obstructive pulmonary disease (COPD). For the sixth consecutive time, Rutland Regional was one of 855 hospitals out of 2600, and the only one in Vermont, to receive an “A” rating in hospital safety from the Leapfrog Group, and was also awarded the Advisory Board 2018 Workplace of the Year Award.

**Specialties:** Orthopaedics, cardiology, oncology, pulmonology, and women’s health

**Recent developments:** Rutland Regional continues to keep pace with the latest medical innovations, evidenced most recently by the installation of two new-generation 3D breast imaging machines. Rutland Regional is the first facility in Vermont to have this newest generation of three dimensional technology.
Hospital Spotlight

Q&A with
Dr. Daniel Mitchell
Rutland Regional’s medical director of diagnostic imaging

By Sean Ruck

Full disclosure: Recently, I had the opportunity to check out this issue’s Hospital Spotlight firsthand. The experience was as good as one could hope for during an ER visit and I’m happy to say I’ve fully recovered. That said, I wasn’t waving around my press credentials and talking about the Spotlight during my visit like a restaurant critic trying to get a free meal. I was just another patient and I was treated well. Still, it made me realize I had yet to cover the hospital in my own backyard. So that’s being rectified now with the interview that Dr. Daniel Mitchell, medical director of diagnostic imaging was so kind to grant just before the Christmas holiday.

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

Dr. Daniel Mitchell: I didn’t really have a dramatic moment where I said I wanted to be a doctor. I actually just kept following a path all through my education that I was the most interested in, and it kept leading me more into science and a little into math and engineering. It finally came to a point where I knew that it was just something I want to do. Before that, I was thinking maybe engineering or business management with an engineering/science background. But I realized that I wanted to go to medical school because it’s something that just fascinates me. But even at that moment, I didn’t know for sure if I wanted to be a traditional doctor or go into research or something. It was an ongoing process of making choices that aligned with skill sets and interests, and I ended up here. I wouldn’t have predicted it 35 years ago, but I’m very happy with where I am now.

HCB News: How long have you been with Rutland Regional?

DM: It’s been 17 years – I came here from Billings, Montana. I love Vermont. I was looking for a place where I could enjoy the outdoor recreation right out my own back door. Montana is beautiful, but I had to drive an hour and a half to get to the mountains from where I lived and it wasn’t as accessible year round.

HCB News: Does being a healthcare provider for a sparsely populated state present unique challenges?

DM: There are some unique challenges, but there are also some unique advantages. Certainly among the challenges would be the sparsity of the population. Not necessarily the resources available, but to some degree. The interesting twist is that although we’re a small hospital, we’re also in a state that’s very small and very rural. In any other state, a hospital our size would be really quite little and perhaps unimportant. But in Vermont, we’re the second largest hospital in the state and we are the largest community hospital. So this hospital has a lot of importance, a lot of clout and we get attention from the state regulators and legislators in terms of policy. They pay attention to us. It’s just a much more important link in the medical community than a similar sized hospital in a different state would be, and that’s an interesting position to be in.

HCB News: What attracts staff to Rutland Regional? I know you’ve touched on the outdoorsy aspect of the state, but are there other aspects such as the work culture?

DM: That’s actually something that I think is an advantage of a small hospital. You can change culture much more readily. It’s a small place in a small town and everybody knows each other. The culture here is very welcoming, very collaborative, and I think people are proud of that.

As far as attracting staff, there are two populations. One is the locals who grew up here and wanted to stay, and they can’t help but look at this hospital as the employer of choice in the area, which we are.

Then there are the people from out of town like myself, who see Vermont as the place they’d like to live, and its lifestyle. And similarly, it’s a great place to work. We tend to get a lot of applicants anytime we post a position. It’s a good place to be.

HCB News: Are there any big news items you’d like to talk about regarding the radiology department?

DM: We are constantly staying on top of technology, as you really have to in diagnostic imaging. We have new 3D breast imaging machines which we’re quite proud of. It’s the second generation of 3D tomosynthesis scanning for breast cancer. And we’re still the only hospital in Vermont to
I don’t have data yet, but just anecdotally believe we’re finding smaller breast cancers. I’m very eager to see data at the end of one year to compare. That wouldn’t be surprising, based on nationwide data. We’ve also reduced the callback rate by about half.

In other big news, we’ve almost finished with the construction for a new nuclear medicine scanner, which also has a fully capable CT unit in it. That’s an exciting new avenue for us. Overall, we’re constantly looking ahead in terms of technology, which is exciting.

In any other state, a hospital our size would be really quite little and perhaps unimportant. But in Vermont, we’re the second largest hospital in the state and we are the largest community hospital.

**HCB News**: Are you incorporating AI into your current radiology work?

**DM**: There are some niche applications that I’m pretty excited about. When we’re doing a CT for lung cancer screening, for instance, we have CAD that helps find tiny lung nodules, which is helpful, but it’s rare for it to find a nodule that I wouldn’t find myself. It’s nice to have the backup though. What I find particularly beneficial that it’s helping me to see how the nodules might be changing over time, since it measures the nodules and measures exactly the same way from year to year in a more precise manner than I could easily do. It gives me assurance that the nodule measurement is accurate. We also have CAD in some of our MR and mammography systems.

**HCB News**: What is Rutland Regional best known for?

**DM**: I have to tell you, if I’m out in the community, I often hear people say they have confidence in the care we provide. Invariably, if I’m chatting with a patient before a procedure I’ll find there’s a connection. My wife is a native Rutlander, so I’ll hear “Oh, hey I know your wife’s family. I went to school with her uncle.” It’s a small town, there’s always a connection if you just take a moment to look. And there’s not a person in this community that doesn’t know several people who work at the hospital. So everyone regards it as “our hospital.” They see it as their hospital, but also see us staying on top of things with technology and care.

**HCB News**: What is Rutland Regional currently on the radiology department’s wish list?

**DM**: I mentioned the nuclear medicine camera which is almost completed and the new CT scanner which isn’t a completed project, but we’ve already selected it and it’s in the process. On the wish list would be upgrading our MR platform. That’s probably still a couple of years out, but you have to plan that far ahead. We’re doing really good things with our current MR machine, but the core, the magnet, is 16 years old. We have state-of-the-art software we put on it to make the images, but it’s probably time to do an upgrade over the next two to three years and that’s on my wish list – to get a new magnet.

When the sales representatives from our vendors visit us, they’re always remarking on what we’re doing. For example, with our CT, they can’t believe how many scans we’re able to perform per year on one machine. Most radiology departments doing that volume of scans have two or three machines. The reason we’re able to do what we do is that the hospital has been very supportive and smart with how they allocate their resources. So for instance, if you have people working as transporters, and people who help get the patients changed, and those helping with all the clerical work, this leaves the technologist and radiologist to do the things they’re trained to do and not waste time more or less doing other tasks. We can have a very efficient use of that expensive equipment. That’s an advantage of a smaller hospital. We can be nimble and change to be more efficient where we need to be.

**HCB News**: What score would you give the radiology department on its interoperability with gathering data, speaking with the EMR, etc.?

**DM**: I would give us an 8 ½ and improving. For me, personally, everything is at my fingertips. There’s only one area of redundancy where I have to log again to look at something in the EMR if I’m at a particular place in a study, but that’s more of a minor annoyance. It’s still right there at my fingertips and we kind of solved that by having a separate little laptop that I log into next to the bigger workstations. The X-ray techs probably would say they have a little extra redundancy where they may have to put in some information more than once instead of it instantly populating across the field. That, too, is definitely getting better though. I know that recently we had an instance where the hospital put quite a bit of resources into solving an issue with an interface. We raised the issue and the hospital took it seriously and fixed it. There’s always room to be better, but I’m pleased people are willing to make the effort.
After three decades in practice, NYU Langone Medical Center’s chairman of Radiology, Dr. Michael Recht, has gained substantial insight into what the radiology field gets right and what it could improve. That’s why shifting focus to artificial intelligence a few years back was a natural progression.

Recht is exploring how artificial intelligence can be used to benefit patients and practitioners and ultimately, change how radiology is practiced. The change would rely on technology, but in Recht’s opinion, it’s needed because of technology too.

“I think what I would tell you is when I went into radiology, it was really the center of what you did in medicine. So in all my rotations, when we had questions, we would go down to radiology, look at the films, talk to the radiologists, and we just knew those were the people who could give us a lot of the answers,” he recalled.

Radiologists weren’t just providing information on what was going on with patients he said, but they would also give direction as to what to do next from an imaging point of view, but times have changed and in part due to the introduction of PACS, there’s a perception that there’s not much of a need to visit with radiologists face to face.

Today, when Recht interviews radiology resident applicants, he always asks what kind of experience they have on radiology rounds. They usually answer that they very rarely had rounds or they ask him if he means with an actual radiologist or just reviewing the films in the ward with the attending physicians on their service. “I think that’s really sad and I think AI has a chance to change how we practice radiology and how we integrate with the clinical care teams by allowing us to do a lot of what we do more efficiently and better, freeing up our time from tasks that we currently do, but really don’t need to do. Allowing us to do the things that really drew us into radiology,” he said.

When healthcare AI started, it was about pattern recognition and whether it could really make the diagnosis. Since those days, it’s become clear that AI can impact every aspect of the image chain, from making sure people order the appropriate test, to ensuring exams are protocoled correctly, to data mining the EMR for a more complete picture to use in patient treatment. AI will also be used for quantitative measurements.

“I don’t think many radiologists went into radiology to use a ruler or electronic calipers, so this will be welcomed,” Recht said. AI may help to create reports that are patient-friendly instead of most current reports that are more physician-focused.

One of the most exciting and promising uses of AI is in image acquisition and reconstruction. “We’re doing a lot of work in this area on our own, but we also have a research partnership with Facebook. Our goal is to accelerate MR and CT by a factor of 10. “In MR what that means is that we can do imaging in five minutes – as fast as you can do an X-ray. If we can do that, it takes away one of the reasons to use X-ray over MR. The other challenge in using MR is lowering cost. For CT, we know that a chest CT can give more information than a chest X-ray, but we can’t replace all chest X-rays with CT because of radiation dose. However, if we were able to use AI to allow us save time in MR and decrease radiation dose in CT, again we’d be able to significantly change our imaging paradigms.

“AI has a chance to change how we practice radiology and how we integrate with the clinical care teams.”

One way AI won’t impact radiology, in Recht’s opinion, is by replacing radiologists. More people will be getting imaging exams in the coming years and the exams are getting larger. AI will help radiologists keep up without burning out, will be used to help radiologists increase their accuracy, and will give them more opportunities to pursue aspects of their jobs that can best benefit from their experience and expertise. “My daughter is a radiology resident and the way she is going to practice will be incredibly different than the way we practice today, but I am confident AI is going to make her career most exciting and fulfilling,” Recht said.
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Who gets your vote for data governance?

By Sean Ruck

Today, Rob Barras is the VP of Healthcare for CTG. The company has a division called Health Solutions which represents about 20 percent of their business. However, at the beginning of his career, Barras worked for a company that was developing what they referred to as CHIN or community health information networks. It was one of the healthcare industry’s initial forays into creating systems where interoperability would be the main idea – before EHRs. But the company was stymied by two key issues and neither were technology-based problems.

The first, as Barras explained, was a political issue. By that he meant that healthcare systems didn’t want to share data with competitors in their region. The second challenge was figuring out who would pay for the network. A sustainability model didn’t exist back then. “And guess what? Both of those things are a problem still today,” Barras said.

“Now, those things start to go away when we focus on value-based care. Value-based care will be the mandate and should be the mandate now.”

To be successful, healthcare will need to be more proactive when it comes to adopting technology and change how it manages systems and protocol. He believes some of that change is already occurring.

“We recently conducted a CIO focus group about value-based care. Essentially, we proposed that IT needs a roadmap to determine what they prioritize, and their priorities should be tied to value-based care,” he said.

Of 12 CIOs in the room, all were in agreement. One added that his system is already sharing data with a crosstown competitor because they’re at risk for a shared population. “So now it makes sense. We can’t make decisions for a shared population with only some of the data. We need all of the data or more of it, in order to make smart decisions on how we’re managing that population. That openness is only going to increase as time goes on,” Barras said.

While there is a lot of work tied to interoperability, Barras believes that enterprise information management is the biggest challenge to address most of the issues. “We believe it’s the fundamental challenge as organizations start to understand value-based care and those requirements, not just from an IT perspective, but overall in the business.”

He said providers will want to use their data assets to address concerns, questions and problems. They’ll invest in analytic tools and platforms to answer those questions and deal with the problems. But they’re unlikely to achieve good results if they ignore a key ingredient. “The bottom line is that most organizations don’t have the established governance. Either population health governance or data governance is necessary to be successful in value-based care.”

The issues occurring due to that lack of governance are exacerbated by the steady number of mergers and acquisitions happening in healthcare. Each increases data pileup and multiplies the complexity of the untangling needed to fully benefit from the data being acquired.

Barras said that perhaps the single fundamental premise when it comes to data governance is the mentality that it’s an IT issue. “It’s not an IT issue. It’s a governance issue. It does not own your data. You do. Your departments do. So you need to find a steward who will fit inside the data structure and make the decisions about how you will aggregate and analyze this data to solve emerging business issues. In other industries, these concepts are well-entrenched, but healthcare is still struggling with it.”

In his estimation, the creation of a data governance team shouldn’t require heavy budget commitments. A big team of full-timers isn’t needed to support it. Rather, it can be a group of people working it part time as something they do in their regular position. “Often, there are already people working on these things, so it’s more a shift in thinking than a shift in responsibilities,” he said.

For those who think they’re already on the right track, Barras offered an anecdote. “When we start talking to potential clients, we’ll typically get a response, ‘hey we do this already, and we think we’re pretty good at it.’ But once you start digging under the covers, you often find that what they think is pretty good is not good at all. What you find is that they’re cutting and pasting a lot of information, usually via spreadsheets, for example.”

That cutting and pasting can lead to redundancy and confusion and it afflicts mature and fledgling health systems alike. “So if we look at length of stay, for instance, very often we’ll see that an organization might have three or four or more definitions. They’re moving the needle by adjusting the definition behind the scenes and cutting and redefining to account for it instead of adopting a master governance plan to uniformly decide what length of stay means for the system.” That problem can be multiplied by hundreds, if not thousands, with all the other multi-definition instances within a single healthcare system. The solution? Data governance.

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Enterprise imaging is the hot topic in the imaging IT space right now. Imaging IT is shifting from more than just traditional picture archiving and communication systems (PACS) that focus on each clinical imaging business line to enterprise imaging solutions. At its core, enterprise imaging streamlines patient imaging data, multimedia content, and reports from multiple sources, and combines this information into one manageable platform, which can then be stored, managed, reviewed, and distributed. Many providers undergoing expansion due to the heavy activity of mergers and acquisitions are seeking a solution to consolidate and standardize diverse imaging infrastructures. This has driven increased interest in vendor-neutral archive technology, as well as a trend has been referred to as “deconstructing PACS”. Vendors are working on these enterprise solutions to help support their customers in this effort while creating more efficient workflows to promote better patient care.

When choosing an imaging IT solution, whether it be a PACS or enterprise imaging solution, many hospitals are concerned with integration and interoperability. To help bridge this gap, some third-party vendors have moved into this space, mainly to provide software and interfacing solutions to help reduce some of the costs that can be involved from an integration standpoint.

With any IT solution also comes the concern for better cybersecurity. Hospitals are more concerned than ever with data breaches and are seeking out vendors that can offer the latest security innovations to prevent high-level breaches and ransomware threats. Many facilities are making the change from in-house network security solutions to outsourcing operations, which allows them access to experienced experts in the field at lower operating costs. Cloud-based solutions are also becoming preferable from a workflow standpoint as remote access for viewing, consulting, and diagnostic support is highly desired by clinicians.

As imaging departments continue to seek solutions to demanding workflow issues, artificial intelligence and data analytics are becoming areas of interest for customers considering an imaging IT solution. The buzzwords floating around all imaging segments right now seem to be artificial intelligence (AI) and deep learning. Vendors are building upon their current imaging IT platforms to create new software applications to aid radiologists in enhancing productivity. Deep learning has proven to be effective in CT, MR, and X-ray. Imaging vendors have utilized deep learning through AI to produce algorithms aiding in slice placement, to assist technologists in becoming more efficient and completing their tasks more quickly. The utilization of AI in the MR/CT space is automatic reconstruction, which replaces the need for the technologist to do MIPS and other post-processing. AI has also proven helpful for patient motion tracking to help with x-rays to reduce motion artifacts and rotation issues, and in breast ultrasound for detecting lesions. There are several other AI solutions submitted by multiple vendors pending 510(k) clearances, and many that are still in the concept and testing phase.

The future of AI across all imaging technologies is far reaching, but one of the main concerns to address with AI is the detection of anomalies across the radiology spectrum. The goal of these software applications is not to replace the radiologists, but to assist them in reducing their day-to-day reading times, which can improve workflow and productivity. This increased efficiency can improve patient outcomes, as many radiology exams take an average of 24 to 72 hours to read, at best, and longer in some cases. This can mean critical time wasted between diagnosis and treatment.

As vendors develop more robust AI and deep learning platforms to read images, another goal is to read ahead and catch anomalies, which can help reduce the number of reading errors and misdiagnosis resulting from the speed with which radiologists must read images. While some skeptics in the industry have concerns that AI could eventually take the place of the radiologist and eliminate the need for human interaction, that is a farfetched notion. AI and deep learning will no doubt expand in the coming months and years, but they may not be able to detect every nodule, lesion, and anomaly that comes across an image. That is where the experience and skill of the radiologist comes into play, along with the diagnostic workflow process. AI is meant to assist with the current imaging IT workflow – not replace it.

With all this excitement around AI and deep learning, many of these software applications come with a hefty price tag. Over the past 12 months, MD Buyline clients’ interest in purchasing an enterprise imaging solution or replacing their legacy PACS system has slowed down significantly, while upgrade purchases have been stable. The cost of replacing current PACS systems and budgetary restrictions is keeping many facilities from making the switch. Pricing for imaging IT systems is highly variable, hinging on configuration and dependent on each facility’s specific needs. According to the MD Buyline database, customers can expect to pay anywhere from $500,000 to more than $1,100,000 for a complete imaging IT solution.

About the author:
Julie Johnson has been with MD Buyline since 2008. She serves as an analyst, providing support to the clinical analysts and helping MD Buyline members make informed purchasing decisions.

Share this story: dotmed.com/news/45954
The annual gathering of the European Congress of Radiology will take place this year from February 27 to March 3 in Vienna. This year marks the 25th anniversary of the Congress being held in Vienna with the event spanning just over three decades in total. We spoke with European Society of Radiology president, professor Lorenzo Derchi to learn more about this year’s event, get the updates on the society and his take on the challenges and advancements in radiology.

HCB News: With ESR representing such a wide range of countries, are lots of different methods/processes introduced to the society or does ESR act more as a singular guide for radiologists to look to?

Lorenzo Derchi: Europe comprises a number of different nations and each of them has its own healthcare system; therefore, the ways of practice are somewhat different from each other. Additionally, because postgraduate training systems are different in many of the European nations, i.e., driven only by universities, by teaching hospitals (or by both of these institutions), the length of residency programs is therefore not homogeneous (although programs are quite similar and postgraduate certification obtained in one nation is valid throughout the entire EU).

I do believe that the most important goal of ESR is probably the “harmonisation” of radiology in Europe and we have a number of initiatives working to achieve this goal. We published the “European Training Curricula” (for undergraduate teaching, for residency programs and for sub-specialization level), which are endorsed not only by national radiological societies, but also the UEMS (European Union of Medical Specialists).

We have developed the “European Diploma of Radiology” (EDiR), which does not substitute the certification in radiology provided by the national authorities, but is a certification that demonstrates that the holder has reached the competencies, attitudes and skills outlined in the curricula. We are working, again together with the UEMS, on the “European Training Assessment Program” (ETAP) and the “Accreditation Council for Imaging” (ACI), harmonising the assessment of residency programs and the accreditation of European meeting and educational activities.

We run an office in Brussels that closely follows the activities of the EU, works on increasing the profile of radiology within the European institutions, and contributes to shaping European health policies and standards. The European Institute for Biomedical Imaging Research (EIBIR) established by the ESR helps radiologists and related professionals obtain research funds from the European Commission to advance biomedical imaging research in Europe. EuroSafe Imaging is an ESR initiative aimed to support and strengthen medical radiation protection across Europe following a holistic, inclusive approach.

HCB News: Are there dramatic differences in the technology being used and the training in different member countries?

LD: The training curricula prepared by the ESR have been endorsed by our National Societies members. This endorsement has been put into action, since most of the national training programs in Europe have been developed following the contents proposed in the ESR curricula, thereby demonstrating that our harmonising effort is working. Regarding the technologies being used, there are relatively wide differences in terms of numbers of high-end machines within the different nations. However, as far as I know, the variations are not dramatic. At a European level, patient organisations are working to decrease differences in terms of availability and ease of access, but the quality of services offered by radiologists is quite high in all European nations.

HCB News: In last year’s ESR interview, a key challenge for members was the cost reduction drivers in healthcare and austerity measures being pushed. Has the problem increased, decreased or remained steady in the last 12 months?
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LD: There are still problems in the healthcare systems in Europe, although these differ from nation to nation. The main way of measuring the services provided by radiology is based on the volume of examinations performed, meaning “productivity” is what most administrators want from us. The last time I met one of our regional health administrators, here in Genoa, he told me that he expected from us radiologists more examinations with less expenses. He stated this without mentioning any quality criteria about our work, just as if radiological departments were “examination factories” and the approach to each patient could be standardised with a correct and timely diagnosis granted in each instance.

We, however, have to recognize that, following the debate on value-based healthcare started in the USA a few years ago, discussions about a new way of providing reimbursements to caregivers according to the outcomes of the care provided have also started in Europe. The ESR has recently published a white paper about value-based radiology, discussing the “value” of radiological examinations in patient care and suggesting metrics to measure it. Furthermore, the society is currently working on a paper addressing this topic, together with some of the most important radiological societies worldwide, to be published in a major general medicine journal. Additionally, it must be underlined that in many European healthcare systems, and even at EU level, a lot of attention is paid to the appropriateness of radiological requests. Through a collaboration with the ACR (American College of Radiology), the ESR has developed a Clinical Decision Support system that integrates imaging guidelines into the ordering system of hospitals, guiding referring physicians to request the most appropriate study for each clinical indication. The “ESR iGuide” system is already used and fully integrated in a number of institutions throughout Europe, and the results obtained by its use will be discussed at ECR 2019.

HCB News: Have any new problems emerged in the last 12 months?
LD: I do not see any specifically “new” problems. However, the issue of artificial intelligence (AI) is still very prominent, as it has been continuously growing during the past year. At ECR 2019, its current importance will be shown not only by the number of sessions in which invited experts will discuss the present and future applications of AI in radiology but, more importantly, by the 263 scientific abstracts which have been received on this topic. This is a clear indication that there are many research and clinical centers within the radiological community working on AI, and that there is a willingness from the radiologists to be an active part in the application of AI, with the topic entering into everyday clinical practice.

At ECR 2019, [AI's importance] will be shown not only by the number of sessions in which experts will discuss its applications in radiology but, more importantly, by the 263 scientific abstracts which have been received on this topic.

HCB News: There is concern among some American radiologists that artificial intelligence could compete for their jobs in the future. How do European counterparts view AI?
LD: I am sure that some of my European colleagues are concerned as well, but let me assure them that this is not what the future development of AI will bring for radiologists.

Myself, and indeed all of us at the ESR, encourage all our members and radiologists worldwide to view AI not as a threat, but as an addition to the radiological toolkit, which can, and already does, help us with our work and ultimately benefits patients. Especially when it comes to big data, there is no way around artificial intelligence; there are tasks which simply can’t be done without AI.

So will AI change radiology? Definitely, but if you take a look back at the history of radiology then you will see that there have always been technological innovations and revolutions in our field. Radiology has changed a lot since its humble beginnings, but a constant is that it has always benefited from a close relationship between technology and the human knowledge and expertise, and I am convinced that this will not change in the future.

I would like to ask your readers if they are familiar with the “three laws of robots” created by Isaac Asimov, the great science fiction writer. The future cannot be predicted, but can be prepared, and we have to prepare ourselves for this new challenge.
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Radiology has changed a lot since its humble beginnings, but a constant is that it has always benefited from a close relationship between technology and the human knowledge and expertise, and I am convinced that this will not change in the future.

I can’t reveal too much as of now, but let me tell you that to honor the anniversary, we have come up with a couple of fascinating new things for ECR 2019, including a breathtaking opening ceremony, the “Grand Opening” which will explore the theme of the “Five Senses”, and other new concepts that will leave participants speechless.

I am very much looking forward to a new addition to the program called “Women in Focus”, which was envisioned by myself and the ESR, and is being led by professor Hedvig Hricak. “Women in Focus” will explore and celebrate the crucial role that women play in healthcare on a daily basis, whilst offering advice and insights to all attendees. The two-day programme will provide a platform for a diverse range of speakers to share their inspiring experiences, offer constructive advice and debate the often difficult issues surrounding gender and healthcare. The entire programme will be held in memoriam to the late professor Alexander Margulis.

One development I would like to draw your attention to is the fact that The Cube, ECR’s dedicated learning space for interventional radiology, has more than doubled in size for ECR 2019. Due to its outstanding success last year, The Cube will move into a new building, the DC Tower, which is the tallest building in Austria and is located just a few steps away from the conference center. The tower, together with the adjoining Techgate and the DC Box, mark the latest three additions to the ECR City, which is growing every year as the congress expands to other surrounding buildings.

Another thing not to miss at ECR 2019 will be the great additions to the technical exhibition, which will, amongst other topics, focus on artificial intelligence, and will be presented in a very exciting and unique way. There are many more developments I could mention, but let me conclude with the thing I am most looking forward to, which is meeting all of you at ECR 2019.

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

LD: There are two main challenges. The first is to ensure the availability of radiological services everywhere. There are still many areas in the world where only basic radiological services are available and too many people still have no access to up-to-date technology. The ESR has a number of initiatives and educational activities which help to tackle these issues. The second, as mentioned before, is related to the rapid advancement of technology. Artificial intelligence (AI) is entering our field and it is difficult to foresee how and in which ways exactly it will impact our profession. The program of ECR 2019 will explore this issue with a number of sessions dedicated to AI from a variety of points of view. These include looking at the applications of AI in our current work, what the possible future developments of AI will be, how these will affect our daily work, and how they will change the doctor/patient relationship.

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ECR Exhibitors 2019

CIRS - Expo X1, Stand 128
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.

DOTmed.com – Expo X2, Stand 203
Are you getting the most out of DOTmed? Visit us at ECR to answer your questions and help explain the many ways we can help improve the bottom line for your company. Learn why over 290,000 users are registered and get tips to optimize your DOTmed user experience. Don’t forget to pick up free copies of HealthCare Business News. By the way, DOTmed is totally mobile — get our free app for any phone or tablet and take DOTmed everywhere you go! You can also sign up for online news notifications catered to your interests. We look forward to meeting with you!

Dunlee - Expo 2, Stand 212
Dunlee to showcase products that ease integration and promote reliability at ECR
Dunlee, a leading provider of quality imaging components, will showcase its IG700 X-ray generator, designed with a modular architecture for easy integration. Dunlee is also featuring the DU33100-E X-ray tube with unique thermal management to support high throughput, and its fiber-interspaced anti-scatter grids. In addition, the DA200P40, Reevo240G, S532Q and S532B (known as Akron) replacement CT tubes will be exhibited, part of Dunlee’s full portfolio of CT replacement tubes for GE and Siemens CT scanners.

Gammex - Expo X5, Stand 527
Gammex, a Sun Nuclear Company, develops solutions for your evolving diagnostic QA needs. Visit us at ECR to learn more.

The featured Advanced Electron Density Phantom supports IVDT calibration automation. Other CT products include the Mercury 4.0 Phantom for advanced CT image quality assessment and automatic exposure control, Multi-Energy CT Phantom and Advanced iq Modules.

Mammography products featured will include the Modular DBT™ and Mammo FFDM™ Phantoms, designed to test Tomosynthesis and Full Field Digital Mammography systems.

Proven QA solutions for Ultrasound, Digital Radiography, Computed Radiography, and Fluoroscopy will be featured as well.

Richardson Healthcare - Expo X5, Stand 538
Richardson Healthcare/IMES 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 Parts and Training Center in the Netherlands. Discover A Better Choice for tested replacement parts, service training, certified CT tubes and MRI solutions—all backed by 24/7 technical support.

Varex Imaging - Expo X2, Stand 224
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™ Launches a New Version of Volpara®Live!™ at ECR
Volpara Solutions is launching a new version of VolparaLive! at ECR 2019. The VolparaLive! system automatically analyzes patient positioning and compression and provides real-time feedback to Technologists. It is mammography’s first real-time decision support system available at the point of care. Designed to help technologists acquire consistent, high quality mammograms, VolparaLive! puts data in the technologists’ hands before the patient leaves the room. This helps optimize productivity, reduce costs through the reduction of retakes, and increase staff effectiveness.

VolparaEnterprise software is the only solution available that provides a comprehensive assessment of image quality on every mammogram, including positioning and compression, which the FDA attributes as the cause of most clinical image deficiencies and failures of accreditation.

W7 Global - Expo X5, Stand 540
New, used, and refurbished X-ray tubes regularly kept in inventory, especially for CT, cardiovascular, and X-ray equipment. Parts, detectors, and tubes for other modalities are also available. W7 Global’s focus is on tubes and parts to support independent service organizations with their needs and growth. We offer friendly service, decades of experience, and fast delivery, with inventory available in Europe.
The following are just some of the products and services on display at ECR 2019. To view these products online or to share the article with colleagues, visit dotmed.com and enter the code DM45961 in the search window or enter the address www.dotmed.com/news/45961 in your browser.

**ALTA750™**
Richardson Healthcare - Expo X5, Stand 538
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). To optimize and increase the life of your new ALTA750 tube, Richardson Healthcare includes a Heat Exchanger and new HV Cable Kit as a complete tube assembly. For a limited time, all first-time customers of our ALTA750 will receive a complete satisfaction, money-back guarantee for 90 days after installation.

**Nexus DR Software**
Varex Imaging - Expo X2, Stand 224
Nexus DR is advanced, digital X-ray image acquisition software designed to quickly and easily automate patient workflow and obtain higher quality images using less dose. Integrated with Varex 14x17 wireless cassette-sized detectors, Nexus DR provides a cost-effective and trouble-free solution that includes advanced image processing algorithms for optimal image quality and excellent reliability. Nexus DR is an efficient solution designed to provide fast and accurate diagnostic images with minimal user interaction.

**IG700 X-ray generator**
Dunlee - Expo 2, Stand 212
Based on the most successful generator in interventional imaging, the IG700 X-ray generator delivers outstanding performance. Thermal modeling prevents tube overload by adjusting the energy supplied to the tube, and Dunlee's exclusive automatic tube calibration with every X-ray exposure lengthens tube life. In addition, the generator supports grid-controlled fluoroscopy, which enables high image quality while reducing X-ray dose. Designed for long life, the IG700 experiences downtime only once in 15 years, on average. Its modular architecture consists of six subunits for easy integration and serviceability, and built-in diagnostic tools allow remote diagnosis.

**Dunlee DA200ULTRA CT Replacement tube**
Dunlee - Expo 2, Stand 212
This OEM-equivalent, 6.3 MHU CT replacement tube can replace GE CT tubes which are installed in the BrightSpeed™*, Discovery™*, Lightspeed™* and Optima™* CT scanners.

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

**MCS-6074D CT Tube**
Varex Imaging - Expo X2, Stand 224
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

Healthcare Business News | January/February 2019
Current Events in European Radiology

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

UK and U.S. researchers develop AI models to address emotional stress of cancer

Posted online January 03, 2019 by John R. Fischer

In January, Researchers from the Centre for Vision, Speech and Signal Processing (CVSSP) at the University of Surrey have collaborated with the University of California in San Francisco (UCSF) to develop two new AI models designed to predict emotional symptoms of cancer and their severity throughout the course of treatment for a patient.

Considered to be a first-of-its-kind study, the evaluation has found that both are capable of accurately determining the severity of depression, anxiety and sleep disturbance – all common symptoms associated with cancer – enabling them to more clearly assess reductions in quality of life for patients.

“We are planning to integrate all our work in a tool to make it accessible and reusable by other researchers. However, this will also require more data for training and tuning the algorithms,” Nikolaos Papachristou, one of the designers of the algorithms, told HCB News.

Depression occurs in up to 60 percent of patients while anxiety affects between 35 and 53 percent. Both are experienced by 45 percent, and linked to both are complaints of sleep disturbance in 30 to 50 percent.

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Philips acquires AGITO Medical to ramp up multi-vendor service capabilities

Posted online February 15, 2018 by Gus Iversen

In February, Philips completed the acquisition of AGITO Medical, the Denmark-based provider of third-party service and refurbished imaging solutions.

According to a statement provided by Philips to HCB News, all 70+ AGITO employees will be brought under the fold of the new ownership.

“AGITO Medical will further strengthen Philips’ Diagnostic Imaging business in the area of multi-vendor services,” said the spokesperson.

Agito Medical has facilities in Denmark, France, Germany, Spain and the Netherlands, where it cooperates with numerous clinics, hospitals and laboratories, as well as with all major OEMs across Europe, according to the company’s website.

In 2015, the company sold the general trading segment of its business to FAMECO, a move which enabled the company to focus exclusively on its imaging business, which was expanding rapidly at the time.

Philips would not disclose the financial details of the transaction.

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Advanced Imaging eyes European market with Dedicated Imaging Solutions acquisition

Posted online July 23, 2018 by John R. Fischer

Advanced Imaging Systems LLC (AIS) announced in July that it is adding parts repair to its service portfolio following the acquisition of Dedicated Imaging Solutions LLC.

The Florida-based MR and CT inventory provider will leverage the resources of Dedicated to propel growth in domestic and international third-party markets, particularly in Europe.

“The third-party market in Europe is growing twice as fast as it did in the U.S. There are a lot of U.S. executives in Europe who are hoping to grow that third-party sector of the market,” Charles “Chad” Fowlkes, owner and chief manager of Dedicated Imaging Solutions, told HCB News.

“With the amount of inventory, repair processes and testing procedures we have, we will be able to complement this growth by supplying multiple parts in Europe and providing a longer exchange rate to get parts back from there, which is one of the largest issues.”

All employees at both will retain their positions, with the companies looking to hire additional staff to support repair and expected growth from the acquisition.

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GE to open first-of-its-kind AI-powered Command Center in Europe

Posted online October 05, 2018 by John R. Fischer

In October, GE Healthcare announced a first-of-its-kind, AI-Powered Hospital Command Center in Europe at Bradford Royal Infirmary in the U.K., as part of a collaboration with Bradford Teaching Hospitals NHS Foundation Trust.

The two are integrating a variety of AI capabilities within the 800-bed facility for clear, instant and real-time overview to assist staff members in making quick and informed decisions for managing the growing number of hospital patients, particularly in accident and emergency (A&E) attendances.

Around 350-400 patients come through BRI’s A&E every day, a figure 40 percent higher than a decade ago, and 96 percent of bed capacity is used regularly. Located centrally in a refurbished space at the site, the Command Center program will aim to mitigate some of this burden with better workflow efficiencies.

The technology comprising it forms a so-called “wall of analytics”, used by up to 20 Trust staff members to pull in streams of real-time data from multiple systems, such as EHRs, PACS, labs, staffing systems, ambulance information, and numerous information sources, both in and outside of the Trust.

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UK in need of 1,004 more full-time radiologists, says RCR report

Posted online September 11, 2018 by John R. Fischer

More than $134 million (£116 million) was spent in 2017 by NHS hospitals to outsource patient scans – enough to cover the shortage of radiologists in the U.K. and pay for approximately 1,300 full-time consultant radiologists.

That’s according to the annual radiologist workforce report released this month by the Royal College of Radiologists (RCR), which for the first time has specified the number of additional full-time diagnostic radiologists needed, a figure of 1,004. The need for more is due to a 30 percent rise in scan workloads and is predicted to grow to at least 1,600 radiologists by 2022, should this trend continue.

“The increase in exams is mainly driven by the growth in CT and MR scanning,” a spokesperson for RCR told HCB News.

The total £116 million amount spent on outsourcing is nearly £30 million higher than the £88 million spent in 2016 and double the £58 million spent in 2014. Costs for the UK in total rose from £47 million in 2014 to £99.3 million last year.

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Manchester United puts Canon imaging solutions into team health center

Posted online November 05, 2018 by Thomas Dworetzky

Sports doctors tasked with keeping Manchester United’s footballers in top form teamed up with Canon in November for critical injury diagnosis and treatment.

“Canon’s equipment,” said club doctor Steve McNally, “has really taken us to another level, with advanced imaging that allows us to detect things that we might not have noticed before.” Calling the image quality “exciting,” he said “it improved my diagnostic confidence in what we can do for our players.”

The multi-year deal has the club’s Aon medical center housing an Aquilion ONE VISION Edition CT scanner, a Vantage Titan 3T MR scanner, an Aplio 500 ultrasound scanner, and a Viamo portable ultrasound system.

McNally likened the ultrasound scanner, to “an extra pair of eyes,” saying that it “gives me information that I didn’t get from standard clinical assessment alone. Our scanning with the MR system provides even greater detail. We get high-resolution images throughout any section of the body in three different planes. The CT scanner, meanwhile, is invaluable in work like monitoring fracture healing and assessing bony and soft tissue problems.”

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IAMERS panel addresses challenges to European third-party providers

Posted online September 19, 2018 by John R. Fischer

In a panel discussion in September, “The Future of Independent Sales, Service and Parts in Europe,” at the 14th Annual European Meeting of IAMERS in Athens, Greece, Mehdi Smail, chief strategy officer of LBN Medical A/S, asserted that healthcare providers in Europe often worry that third party servicers will go out of business and leave them in the lurch.

“The customer would buy from a distributor or non-OEM organization but they would not trust a non-OEM organization to provide service for seven years,” he said. “In the end, they buy from the OEM because the deal is better. It illustrates how OEMs are considered the safe bet for service because customers are afraid that small companies may not be available long-term for service. That’s a big issue for us.”

According to the audience, in-house service is the wave of the future for equipment service in Europe. They indicated this in a survey concurrent with the discussion. Most of the audience also agreed that the largest growth potential for the European third-party market lies in parts, followed by service, with equipment offering little opportunity.

Share this story: dotmed.com/news/44481
Paul Schulz is no stranger to process improvement, and in recent years he has come to understand the potential RTLS has to make hospitals more efficient than ever.

HealthCare Business News sat down with him to learn more about his background with real-time location systems and what insight he can share with healthcare providers to help make their adoption of the technology go more smoothly.

HCB News: Real time location systems (RTLS) can be the key to unlocking significantly improved workflow efficiency in healthcare. In your experience do most hospitals and health systems recognize the value in RTLS or is it still something that is misunderstood or flying under the radar?

Paul Schulz: Hospital systems are starting to understand the value of innovation and need to innovate deeper into operations will push RTLS data and deployment in the coming years. Recently the advent of business intelligence challenging the current state of operational reporting is helping people consume larger data sets with greater understanding. Historically RTLS has been a great vehicle to understand location, status and provide notifications to help automate workflow steps but information about care process workflows are providing leaders improved views. The phrase, “flying under the radar” actually fits well into the potential for teams to create improved patient care processes.

HCB News: Can you tell us about your own background and how you came to be an expert in RTLS?

Paul Schulz: Let’s hold off on expert status with early stages of full RTLS still eluding us but the value it has brought to an industry needing operational data has been exciting. I’m thankful for the 20 years of process engineering and the lessons provided striving to be “world class” to compete. The past 11 years in healthcare started by helping organizations build improvement models based on lean, six-sigma or leveraging proven models or Studer principals. Operations always have tools and the experience I tend to lean on (no pun intended) is when manufacturing started using Enterprise Resource Planning (ERP) systems like SAP or some other brand for production steps. We pulled massive amounts of data and took years to fully optimize. The implementation of Electronic Health Record (EHR) systems is totally different but similar, so walking that path in a previous life has been beneficial.

Seven years ago, we started looking at RTLS as a workflow tool compared to asset tracking, which at the time was groundbreaking. That started the process of continuously challenging metric sets and striving to deliver a better data story around resource allocation. RTLS workflow visibility and improved data reduce random changes which can be frustrating for all; patients, customers, staff, providers, and the organization to the point where it no longer seems worth it. The last three years at Eide Bailly we’ve invested a great deal of time and talent utilizing new tools for large data stream management. With this piece of the puzzle coming together, elements of RTLS continue to evolve into a necessary component of organizational innovation.

HCB News: You have helped some big facilities, such as Altru Health System, implement RTLS systems. What are some of the most valuable lessons and experiences you’ve taken from those partnerships?

Paul Schulz: The first is to understand is that care cultures need time to adapt the new technology. Most of the learning happens in the first couple of weeks of system start-up, and process modeling before going live helps relieve start-up stress. We’re finding the amount of effort put into data structuring on the front side helps providers consume information sooner and start the innovation cycles on a better note. The RTLS system...
and reporting functions designed need to be flexible, so they grow with the team’s capacity to learn and challenge the current state.

The term "real time" migrates quickly into staff vocabulary and the ability to quickly recognize the flow of work from the system builds engagement. Another contribution to engagement is providing your team a fixed point in the stream of data that unites the RTLS effort with strategic goals. At Altru we focused on cycle time of patients and that has evolved into a more mature understanding of work flows.

Leaders have to get in and roll up their sleeves. They need to be the first to learn the data, understand the system, and answer questions so the team can trust the system by trusting the leaders. This helps with innovation as trust builds freedom to explore and dream. Cultivate better conversations with front line leaders based on information compared to assumptions.

**HCB News:** With so many RTLS systems (including RFID systems) on the market, what factors should a facility consider when selecting the right one for their needs?

**PS:** RTLS systems are vying to find a home in the health care world and new technology makes the decision process a little difficult. Primary to the process is investing in a hardware system that is fast and accurate. Latency time between the action of care and the visible displays are important for the team to see and trust the system. Another element of speed is when integrating with EHR's they sometimes have a latency timer to not exceed a certain amount of seconds before the software *times out*. Always test drive what you may be buying.

They key for software is capacity for rules and data management. As you expand the system make sure the system expands with you. How is data organized into what kind of database? Is the database accessible? Will it generate custom reports? How? Can you export data into business intelligence tools or similar technology for reporting? Be careful that your teams desire to innovate is not harnessed by system capabilities.

Health systems regard RTLS as a technology application to solve a certain business case needed today. It makes sense to provide an ROI focal point, but once that business case is solved, then what? An organization should consider how RTLS can be used for operational learning, innovation and overall productivity. We believe the ROI to be a reduction to the cost of care per incident of care provided over a specified period of time.

**HCB News:** How should a provider or facility prepare for installing an RTLS system in their hospital?

**PS:** Considerations should be applied to what the organization’s appetite for process improvement is and the maturity of the improvement model. The organizations we are working with are starting with ambulatory flow and stepping into ED management, hospital asset management (including bed management and nurse work flow) and then into the OR. The OR is probably the Super Bowl of RTLS deployment and the organization will need a mature and educated team to tackle those processes. However, there is much to be gained in that environment when looking at OR suit utilization and surgical case flow.

**HCB News:** What are some of the most common mistakes that facilities sometimes make when introducing RTLS to staff member workflow?

**PS:** Being afraid. We always tell staff that what you did yesterday, last week, last month works but we need to improve. RTLS on its own won’t change the world. Nor will it end it. Move forward with it. Get used to the functionality of button presses and work flow rules that help staff perform their care steps. Staff adaption is a simple bell curve. You will have early adapters on one end and naysayers on the other with the majority of those in the middle waiting for the bell to tip in one direction or the other. Leadership plays an intrinsic role managing the bell curve of staff engagement.

On the technology side you need a solid Wi-Fi system that has available bandwidth. Uptime for the system needs to be high. A transparent tech team will need to monitor and manage the system while communicating with staff when issues arise. Overall, we’ve found the RTLS system to be stable but when outages happen front line staff miss the RTLS functionality and how important the system has become in day-to-day functions. It really does work in the background, so the tech is not intrusive but the functionality is missed when issues arise.

**HCB News:** When you look at what providers can do with RTLS today, do you feel like the capabilities of these tools are being optimized or are there greater benefits that we’ve yet to tap into?

**PS:** We’ve only scratched the surface. It seems that the additional technology added to healthcare over the last decade has decreased productivity with some gains in quality and safety of care. It’s time to reduce the amount of time needed to transfer information, find people, find things, understand stages of workflow and get ourselves out of the space of not knowing and into the arena of knowing. RTLS helps us know where the patient is, status and location of equipment and where staff members are when you need them. It helps us to be predictive and understand when we need to be somewhere before the request arrives and reduce patient wait time, which is expensive to everyone.

**HCB News:** Anything else you want to mention about RTLS trends that I have not asked you about?

**PS:** Leaders find it difficult to measure the magnitude of return from different investment opportunities. Losing the intellect, or wasting the innovation that could come from one of the more educated and passionate workforces is a cost that should not be overlooked. In the words of Sakichi Toyoda, who helped develop Toyota Industries, “The most detrimental of these if not followed (elements of lean production thinking) is not growing your people.” Feeding an intelligent workforce better and more accurate information helps grow their operational intelligence and improve care processes. RTLS is a great source for this information.

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Disruptive Innovation

Is medical 3D printing destined to become as commonplace as X-ray?

By Dr. Beth Ripley

More than 100 years ago, Mrs. Anna Roentgen saw the world’s first X-ray — taken of her left hand — and the shock of seeing the skeletal outline of her own fingers made her declare “I have seen my death”. The famous image was created by her husband, Sir Wilhelm Conrad Roentgen, a German mechanical engineer and physicist.

Of note, Sir Wilhelm was not focused on advancing medicine when he discovered that X-rays could see within the body. The image was just one of a series, largely consisting of inanimate objects, and there was nothing wrong with Mrs. Roentgen’s hand. However, that image captured the imagination of healthcare providers, and it’s no secret the technology has revolutionized medicine, with an estimated 3.6 billion diagnostic X-rays performed annually.

3D printing is another non-medical innovation which has captured the imagination of healthcare, and although the novel opportunity to hold your own internal organs in your hands might elicit squeamish feelings like Mrs. Roentgen’s, years from now medical 3D printing may be as commonplace as an X-ray.

3D printing was invented in the 1980’s by engineer Chuck Hull. Like Roentgen, Chuck Hull’s wife was the first person to see the product of his invention — he called her out of bed in the middle of the night to come down to the lab in her pajamas, and she told him “this had better be good”. It is safe to say it was good — good enough to fuel a manufacturing technology estimated to exceed $20 billion in 2020 and impact fields as diverse as architecture, aeronautics, and medicine.

Medical 3D printing is still very much in its infancy; approximately 100 hospitals in the U.S. have in-house 3D printing capabilities today, up from three in 2010, (according to an SME 2018 Medical Additive Manufacturing / 3D Printing report). Following this trend, the Department of Veterans Health Affairs has seen growth in 3D printing hospitals from three to 20 over the past three years.

The enthusiasm for the technology and its adoption is expected to continue to grow at a rapid pace, and new medical applications are likely being imagined weekly. These include use of physically accurate models of a patient’s anatomy for pre-surgical planning, creation of bespoke implants, design of custom surgical tools and cutting guides, and custom orthotics and prosthetics, to name only a few.

Part of the magic of 3D printing is its democratization of manufacturing. Ideas can be prototyped rapidly and inexpensively, lowering the threshold for testing out new concepts and ideas. This puts the power of innovation squarely in the hands of front line staff who have the best understanding of the tough problems in healthcare that need to be solved. This explains the shift in focus of 3D printing technology from so-called “zebra” diseases (those which are rarely seen in healthcare) to common diseases that affect millions, such as cancer, heart disease, diabetes, and musculoskeletal disorders.

However, 3D printing isn’t as simple as dreaming up an idea and pushing a button that says print (at least not yet). Born from engineering, it requires an understanding of theoretical design principles, computer-aided design software, materials chemistry, quality assurance testing, and more. These
skills are not typically taught in healthcare curricula, leaving the people with ideas and firsthand knowledge of healthcare problems often at a loss for how to translate those ideas from concept to actual product. In these early days, engineers who can speak the language of medicine and healthcare providers who can successfully communicate with engineers will play a dominant role in the medical 3D printing space. Hospitals and those in the healthcare industry who can encourage this cross-pollination of ideas and experience will see rewards in terms of new products and services that benefit patients.

Recent work by Ahmed Hosny and colleagues, published in the Journal of Cardiovascular Computed Tomography demonstrates this concept of cross-pollination nicely. Hosny, originally an architect by training, teamed up with two materials scientists and biologists, two radiologists, an interventional cardiologist, and a cardiac anesthesiologist to solve the tough problem of choosing the correct size heart valve replacement in cases where doctors never actually physically see the patient’s heart. This veritable Noah’s Ark of innovators each saw the problem from a different angle, and that blending of perspectives resulted in something new.

Transcatheter aortic valve replacement (TAVR), a groundbreaking innovation in itself, is a technique that utilizes catheters to deliver a new heart valve to a patient through their blood vessels, removing the need for open-heart surgery. This allows treatment for patients who are not surgical candidates, but it requires careful planning to ensure that the right size valve is delivered (too small or too large can lead to catastrophic results).

The physicians on the team described this sizing problem to their non-medical teammates, who borrowed from architecture and materials science to create a 3D printing solution using parametric modeling and multi-material 3D printing technology to create a biomechanical model of the patient’s diseased valve. The model allowed for testing of different replacement valve sizes in a controlled environment prior to surgery.

As a bonus, Hosny put his architectural skills to use to design a reusable 3D-printed sizing device that could replicate the TAVR heart valve for planning, overcoming a major barrier to pre-surgical valve testing (the actual valve costs thousands of dollars, making opening multiple valves for testing purposes a very costly solution).

Other promising innovations include virtual surgical planning and 3D printing of custom surgical cutting guides to decrease operating room time for mandibular surgeries (decreasing operating time by two hours can translate to roughly $9,000 in savings), creation of 3D-printed orthotic braces that are designed to withstand daily activities and enhance patient comfort, as well as 3D bioprinting of tissues that may one day address the global shortage in donor organs.

What of the fact that a large percentage of the world’s population still has no access to routine diagnostic X-ray equipment, let alone 3D printing technology? What that tells us is that our work as innovators is far from done. Increasing access to all healthcare technology, from radiographic equipment to 3D printers, is an ongoing challenge that will require creative minds across disciplines within and outside of medicine. Meanwhile, who knows what the next great technology leap will be, and whether it will change the game entirely.

About the author: Beth Ripley MD, PhD is a radiologist who specializes in translating medical imaging into virtual and 3D-printed models with the goal of changing the way doctors and patients understand and treat disease. She collaborates across multiple disciplines and has a passion for innovation and human-centered design. She is a radiologist at the VA Puget Sound Health Care System and an assistant professor of Radiology at University of Washington School of Medicine. She additionally serves as an innovation specialist for the VHA Center for Innovation and is the chair of the VHA 3D Printing Advisory Committee.

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In popular culture, Pokémon Go is probably the most well-known example of augmented reality, a new type of technology that takes actual physical environments and overlays virtual components. But using your iPhone to capture cartoon characters around the neighborhood is just one example of what AR can do, and medical imaging is full of promising applications.

HealthCare Business News spoke to Ian Watts, a computing science graduate student at the University of Alberta to find out about an AR application he developed called ProjectDR, which allows CT and MR scans to be displayed directly on a patient’s body in a way that moves with the patient.

**HCB News:** As you developed this technology, what was the need that you were trying to meet?

**Ian Watts:** AR is a relatively new field with a lot of excitement around it, so we are looking to explore whether AR systems are viable for medical applications. We can produce more intuitive ways to interact with medical data in real time, increase perception and potentially lead to improvements in patient outcomes.

The specific need we are trying to meet with ProjectDR is to reduce the difficulty in locating and working with anatomy under the skin by providing more information to the clinician and providing an improved experience for the patient. Information can be gained from viewing medical images on a monitor, but it can still be challenging to use that information while working with a patient.

**HCB News:** How did the actual development process go? Were there any particularly challenging hurdles?

**IW:** The development process for ProjectDR was iterative and progressed through various stages of testing combinations of hardware. The first concept was created as a class project in the computing science department using a handheld laser projector, motion capture cameras and markers for tracking. It could only display basic 3D models. However, it worked well enough to give us a solid prototype to improve upon and modify.

The next version was created with substantially improved graphical features, such as volume rendering for displaying CT scan and MR images. The handheld projector was changed to a larger and brighter LED projector and we built a sturdy frame to suspend and move all of the parts overhead of a table work space. The current iteration features a user-friendly interface and many quality of life improvements. There is also the ability to interface with more types of hardware for motion and eye tracking and depth sensors like the Microsoft Kinect and Magic Leap.

One of the specific issues we encountered was finding a suitable projector to use. We initially used a laser projector because of its ability to be in focus at all levels of depth at the same time, something not possible for a regular projector. This was not feasible due to laser projectors not being widely available at the size and cost we wanted, and the handheld model did not have the illumination required to work in a lit room. Switching to an LED projector limited the area which can be in focus, but this has not been an issue with the size of spaces we have been using. The increased illumination and reduced cost have been worth the trade-off.

**HCB News:** What are some of the areas where you’re trying to improve or perfect the system?

**IW:** In order for a system to be used for medical applications it must be consistent and accurate. We have been making improvements to the calibration process of aligning the projector and motion capture systems by trying different algorithms and reducing user input error. Another work in progress is improving and automating the registration between the virtual images and their physical targets. This reduces the setup time and difficulty of usage along with improvements to the user interface. There are no firmly established standards for how an AR system should work since they are new and different from each other, which leaves lots of room for improvement.

Other AR researchers have also been making advancements that can be imple-
mented in the future. An example would be
elegant ways to handle the occlusion that
occurs when an untracked object moves in
front of the projection target.

HCB News: What type of medical
uses does ProjectDR already have? Are
there other applications you see down
the line?
IW: ProjectDR is a general purpose
tool that can be used to display images on
tracked targets, so there are many potential
uses. As I mentioned before, we’ve been
working on using the system for adjust-
ments to the spine. They have to use medical
images to identify a position and direction
to apply a force to the spine. There is a lot of
variability between people so it can be quite
challenging to find internal structures, even
ones near the surface like vertebrae.

With ProjectDR, the patient lies on a table
and has the imaging data of their spine pro-
jected onto their back, giving the clinician
reference points for locating the desired ver-
tebrae and where to apply the force. This
can reduce the amount of time spent locat-
ing, reduce the need for palpation and miti-
gate errors. A simple extension of this would
be to use the system for training. It enables
learning anatomy in a more tangible and
interactive way than a textbook or model.

Another application is for preoperative sur-
gical planning. Segmented CT scan images
can be displayed on the patient or surgical
model and be used to plan the procedure
with a surgical team. This allows the relevant
anatomy to be displayed, moved or hidden as
the planning occurs, and viewed from differ-
ent perspectives. For example, planning the
removal of a lung tumour could involve dis-
playing an image on a surgical model where
part of the ribs and lung are hidden as the plan
progresses so that the tumour is visible along
with veins and arteries relevant to the surgery.
Modifications to the medical images can be
projected onto the patient to preview changes
from a procedure as well. This would be
applicable in plastic and reconstructive surgery
where visual aids are important.

In the future the technology could be ap-
plied to minimally-invasive surgical applica-
tions like laparoscopic surgery. This surgery
is performed by inserting cameras and tools
into the patient’s abdomen and viewing the
operation on a monitor away from the pa-
tient and surgical site. Viewing the operation
through a camera and monitor removes vi-

dual depth cues and limits the field of view.

HCB News: From a big picture per-
spective, how disruptive do you think
augmented reality technology can be
for healthcare and imaging in particular?
IW: AR has the potential to be quite
disruptive. It has already captured many
people’s imagination but more applications
still need to be built and tested. AR can in-
corporate people’s own devices into their
healthcare and make it more personal and
convenient.

Prices of the tools used for AR, like mo-
tion trackers, are rapidly dropping, which
will make AR systems much more common.
Depth sensors like the Kinect are now widely
available and have been appearing in cell phones. Graphical processing units have
been advancing rapidly thanks to the ad-
vancements in other fields.

Training and simulation in healthcare can
benefit from AR since it can reduce costs by
replacing expensive physical models with vir-
tual ones. Training can be made more inter-
active and fun but perhaps most importantly
allow for better performance metrics to be
developed and tracked.

For imaging, AR could improve com-
munication between imaging experts and
the people performing procedures, as well
as the patients. There will also be more col-
laborative applications where many people
can participate, including remote or virtual
participants. AR provides more ways for im-
ages to be visualized and interacted with in
3D instead of on a 2D monitor.

HCB News: Are there other augment-
ed reality projects underway at the Uni-
versity of Alberta, or elsewhere, that
you are also excited about?
IW: One of the other projects in our lab
is the Medbike. It is a cardiovascular rehab
project to get patients to exercise in their
home by using a stationary bike to ride
through a virtual world. Patients can have
trouble keeping up with their rehabilitation
exercises on their own or have difficulty
travelling to a rehab centre while they are
weakened or during the winter. This AR sys-
tem makes rehab in their home more enjoy-
able while also collecting blood pressure and
other data under the remote supervision of a
healthcare worker.

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Artificial Intelligence

AI in healthcare: The current landscape and future directions

By Lauren Dubinsky

After years of pontificating over the advent of big data and what it could mean for healthcare, the medical industry has finally found itself on the verge of a new and smarter era.

But what does artificial intelligence actually mean? How will these sophisticated algorithms be regulated and where are the results going to first show themselves? In some cases, these questions are as complex as the technology itself — but as companies continue to invest in these new capabilities the answers are beginning to reveal themselves.

GE Healthcare drew inspiration from NASA by creating its own Mission Control Center. But instead of managing space flights, it manages a patient’s hospital experience with the help of sophisticated algorithms and predictive analytics.

The command center technology continuously analyzes real-time data across multiple sources to detect and prevent risk, manage staff workload and streamline the discharge process.

Licensed providers within the command center are tasked to monitor and leverage decision support applications. One of the applications monitors patients scheduled to be discharged and addresses problems that could result in preventable delays.

When the hospital or health system first launches their command center, they choose between five and 22 applications based on their specific situation. After that, they have the opportunity to add to their suite each year.

GE is currently working on future applications for perinatal quality, elderly care, patient safety, length of stay, computer vision, population health, genomics and home health.
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“We worked problem-back with clients to understand real-world challenges facing caregivers in leading hospitals,” said Jeff Terry, CEO of healthcare command centers at GE. “AI-powered command centers evolved through years of work as a way to impact many of those challenges.”

To date, GE has implemented 10 command center programs – eight within the U.S., one in Canada and one in the UK. These 10 command centers support 41 hospitals in total.

**AI across the whole health system**

One of those command centers was installed at Oregon Health & Science University (OHSU) in July 2017. The health system’s main goal was to reduce capacity-based transfer declines and utilize their community partner hospitals more effectively.

In the year before the command center opened, OHSU declined more than 500 transfer patients from referring hospitals. But a year after it opened, the health system was able to accept 554 more transfer patients.

OHSU was also able to place 519 transfer patients into community partner hospitals, which freed up beds for patients who require the more complex, quaternary inpatient care that is only available at their academic health care center. To top it off, they also saw a seven-fold increase in return on investment in that first year.

“In order to accommodate various, growing demands on our system related to inpatient access and capacity management, we recognized the need to get reliable real-time data feeds and supporting alerts and to change how we run the daily operations in a more system mindset with a patient-centric approach,” Dr. James Heilman, chief medical transfer officer at OHSU, and Dr. Matthias Merkel, chief medical capacity officer at OHSU, wrote in an email response.

In September, GE announced plans to develop a software application for OHSU to better manage sepsis patient care. The mission control staff will be alerted when the application detects a risk and care teams will be deployed as needed.

Sepsis is a major issue in the U.S. At least 1.7 million American adults develop sepsis and almost 270,000 of them die as a result of it, according to the Centers for Disease Control and Prevention.

“Quick recognition and management of sepsis is critically important to increase the survivability and requires a system-level response,” wrote Heilman and Merkel. “Identifying patients and tracking their care progression along established sepsis care bundles seemed a logical expansion of the work we have done on daily operations.”

Another company that takes a health system-wide approach to AI is a software company based in Palo Alto, California. Ayasdi built an AI platform that their partners and customers can run their applications on.

The company has also developed a few applications of its own. One of its major applications for the healthcare sector is called Clinical Variation Management (CVM), which analyzes hospital EMR and financial data and looks for clinical variation.

It automatically surfaces groups of similar patient procedures and generates clinical pathways that help to achieve the best patient outcome at the lowest cost.
“It discovers the sequences that are similar amongst patients to group them together,” said Gurjeet Singh, CEO and co-founder of Ayasdi. “Then having them grouped together, it predicts the best sequence per patient, and having those predictions in hand, it justifies these to a clinician.”

Four months after Flagler Hospital in St. Augustine, Florida implemented the CVM application, it was able to reduce the average cost of treating patients with pneumonia by 30 percent, reduced admissions by seven times, and decreased the average length of stay by about 2.5 days.

“For this one protocol, Flagler officials have discovered that by using our software, it will benefit them by roughly a million dollars per year,” said Singh. “They expect to have 18 protocols in production over the next 12 months, and expect to save about $20 million over the next three years.”

What makes an AI system legitimate?

“AI” has become a very general term in recent years, and Singh would go as far as to say that it doesn’t mean anything specific anymore. He jokes with his friends that anyone with a Microsoft Excel spreadsheet can claim themselves to be AI these days.

According to him, an AI system should have five important characteristics in order to be considered legitimate. Those include the ability to discover, predict, justify, act and learn.

First off, an AI system needs to be able to learn from large, complex data sets without any human interaction. That is a phenomenon known as unsupervised learning and it’s so important because the system must discover all of the patterns that exist in the data without a human having to ask a question.

The AI system should also be able to use the large data sets to predict what is likely to happen in the future with a high degree of accuracy. Clinicians are still the main clinical decision makers, but AI can provide them with information on future needs, costs, disease burdens and patient risks.

The most critical characteristic of an AI system is its ability to justify or explain its results. That includes every recommendation, prediction and segment of the anomaly.

“If we are going to put our trust in these heavily automated augmented systems, the human operators of these systems have to be able to build intuition about what the system is doing and why it’s taking certain actions, and so on,” said Singh.

Many AI systems are worked on in the research setting, but not all translate into a product. If they are stuck in the academic setting, they are simply explorations of hypotheses instead of actual AI systems.

Lastly, the system has to be able to learn as the data evolves.
“For example, if the system spots that a new patient risk segment has emerged or a new type of payment fraud has begun to exist, then it should be able to update the human operator that something has changed, and [suggest] an action [they] might take in fixing that,” said Singh.

**AI and radiology**

Currently, there is no shortage of AI systems and applications for the radiology field. In the past year, more than a handful of new products came to market.

One of the most recent is Philips Healthcare’s Illumeo PACS with adaptive intelligence, which was a major focus at this year’s Radiological Society of North America (RSNA) annual meeting. The company announced that the University of Utah Health recently became one of the first to leverage this technology.

The health system is tasked to review about 500,000 cases per year due to its large referral base. Before Illumeo was installed, the radiologists had to pull up a case in the PACS and search for the matching new and old images.

Illumeo leverages adaptive intelligence and analytics to automatically find those matching images. It then positions them side-by-side so that the radiologist can determine if the lesions got bigger over time.

“One of the biggest things is the amount of data,” said Dr. Richard Wiggins, a neuroradiologist at the health system. “We all know that we have to look at more and more data all the time for our studies and [some may be] getting reimbursed even less now than they were years ago for those studies.”

When he started his career, he was looking at between 2,000 and 2,500 images per day, but now he looks at about 250,000 per day. With the help of Illumeo, Wiggins and his colleagues are saving a lot of time.

MaxQ Artificial Intelligence also showed off its new AI technology at this year’s RSNA annual meeting. Its Accipio Ix application automatically flags non-contrast head CT scans with suspected intracranial hemorrhages so that those cases go to the top of the radiologist’s list.

MaxQ AI has formed partnerships with GE to incorporate Accipio Ix into its subscription program, and with IBM to add the application to its PACS. The company also has partnerships with Samsung NeuroLogica and EnvoyAI.

“Our goal as a company is to provide intelligent diagnostic decision support tools to the acute care setting,” said Gene Saragnese, chairman and CEO of MaxQ AI. “Many decisions that are made in the ER are time sensitive so we want to make accurate timely decisions. We think these types of tools can help in that type of situation.”

He added that patients are aggressively treated in academic institutions because the physicians have a high degree of expertise, but that is not always the case in community hospitals. MaxQ AI’s aim is to provide these AI-driven applications to physicians so they can have the confidence of an expert.

Accipio Ix received an accelerated pathway through the FDA’s Breakthrough Devices Program. Then, in early November, the company scored 510(k) clearance from the FDA.

Viz.ai is another major player in the AI for radiology field. In April, its Viz CTP software, which automatically analyzes CT perfusion images, was cleared by the FDA. The technology’s advanced image analysis algorithm automatically generates parametric CT perfusion color maps based on the dynamic effect of the contrast agent through the brain.

The company also has another product called the LVO Stroke Platform that detects and alerts specialists to potential large vessel occlusion (LVO) strokes. It connects to a CT
scanner and leverages an AI algorithm to detect the suspected strokes.

A startup company based in Israel called Aidoc is making big moves in this field. Early last year, it launched the first AI-powered full-body solution for CT analysis.

The Aidoc Full Body Solution is an extension of the company’s head and spine AI solution. This new solution can help radiologists identify medical findings in the head, c-spine, chest, abdomen, etc.

Aidoc has big plans for the future. It is working on AI solutions for MR and are also looking into extending its AI solutions to the rest of the major modalities.

When asked what the most exciting aspect of the untapped potential of AI is, Ariella Shoham, vice president of marketing for Aidoc, said, “If I had to say one thing it would be assessing the actual value and showing real influence on patient care. There are so many AI companies that are actually just algorithms that show levels of sensitivity and specificity but are nowhere near an actual implementation in a live setting.”

Will AI eventually replace radiologists?
This is the burning question that often comes up in discussion regarding AI and radiology. The general consensus among industry experts seems to be that AI will not replace radiologists in the near future, but exactly what role will it play in the coming years?

The University of Utah Health System’s Higgins scoffed as he spoke about people who refer to themselves as “futurists”, who predict that there are going to be no more radiologists in the next few years. He believes that AI systems are going to be assisting radiologists and changing what they do, but that they stand no chance of replacing radiologists anytime soon.

“In reality, what I do as a radiologist is way more complicated than what people are doing with these algorithms right now,” he added.

He compared his job to figuring out what’s wrong in those pictures in the Highlights Magazines. Everyone is raving that AI algorithms can recognize a stop sign 70 percent of the time, but the job of a radiologist is much more complex than that.

“Being a radiologist is not really recognizing something like a stop sign, but more the fact that the stop sign is underwater and there are fish stopping at the stop sign,” said Higgins. “I think that’s closer to what we actually do as radiologists when we are interpreting images and trying to figure out not only if there is an abnormality there but what does it mean in terms of the clinical care and the patient’s clinical history.”

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AI and personalized medicine to raise the bar in radiology reporting

By Dr. Jamshid (Jim) Tehranzadeh and Nasser Hiekali

Radiology reporting is becoming more specialized. As a large group with more than 30 radiologists, physicians who use our services expect imaging exams to be read by subspecialists who are equipped with the additional knowledge and experience to enhance the quality of both the diagnosis and the radiology report.

At the same time, we believe that artificial intelligence (AI) and deep learning are vital tools that can be used to help make clinical decisions.

For example, AI can expedite a comparative analysis of current plaques and other abnormalities with previous studies. AI can count the number of plaques, measure the size of each plaque and provide an analysis of its growth or reduction much faster than a radiologist. However it is the radiologist who determines the significance of the findings and makes the diagnosis of a patient’s condition.

AI also plays an important role by analyzing the increase or decrease of cancerous tumors and provides radiologists with the data needed to deliver an overall diagnosis that quantifies the progress or regression for each patient.

Improvement in any field requires research and development. AI offers an important tool that aids in text analytics and changes millions of bits of unstructured raw data into meaningful and helpful results and conclusions that can lead decision-makers to success in many endeavors.

AI technology also offers the ability to reduce costs, improve operational efficiency and accelerate productivity, despite an aging population. And governments or insurance agencies can use this data as a tool to drive programs that enhance population health and increase efficacy of diagnosis and treatment.

Dose tracking is another important element in population health. The Veterans Administration is now tracking radiation dose for each individual veteran during his or her lifetime to discover the cumulative effect of radiation and define the limits that should be imposed to avoid overexposure. This addresses the need to measure and identify the value and risk of radiation-based procedures.

Ambitious strides in technology

These ambitious strides in technology have advanced the practice of radiology. Deep learning is an enhancement and not a threat. We view this much like the promise that computers would reduce the use of paper. Today we are using computers to generate more paper than ever before.

We continue to depend upon the human brain to interpret the diagnostic content of imaging exams. The difference is that today we have more tools than ever before to measure and evaluate a patient’s condition. We expect these decisions to be made by humans for years to come.

In fact, personalized medicine is the next step forward. Collecting and tracking data from imaging studies and other sources can help physicians make diagnostic and treatment decisions based on each individual’s health history – instead of relying upon a protocol that is applied based on generic statistics such as gender, age, clinical history and other factors.

Personalized medicine can also benefit from gains in the specialization of diagnostic providers. Today we have subspecialties in medicine, but leaders in the industry are looking at a better way to approach diagnosis by focusing on specific anatomy instead of a subspecialty branch. For example, musculoskeletal radiologists or orthopaedic surgeons may specialize in a single joint, such as the wrist, hip, knee, ankle or shoulder.

Experienced radiologists have seen thousands or even hundreds of thousands of images, which equips them to identify abnormalities. In the future, deep learning will be deployed to identify abnormalities for review by the appropriate specialty radiologists. This will be a perfect merger of technology and human decision-making. Statistical tools are valuable but they cannot replace a trained specialist.

Ultimately new technology will not only help radiologists and other healthcare providers deliver better care, it will empower patients to make educated choices about decisions related to their health.

About the authors: Dr. Jamshid (Jim) Tehranzadeh is the chief radiologist at United Medical Imaging Healthcare and professor emeritus at University of California, Irvine. Nasser Hiekali is the CEO of UMI Management Company.

United Medical Imaging Healthcare (UMIH) includes 22 facilities that perform MR, CT, X-ray, fluoroscopy, ultrasound, mammography, PET-CT and other diagnostic imaging services. The organization captures and manages more than 500,000 imaging exams a year.

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Dr. John Halamka, already a well-known figure in the world of health IT, has become one of the leading experts on blockchain technology in healthcare, as well as one of its most optimistic advocates.

Last year, in addition to his roles as CIO of Beth Israel Deaconess Medical Center and dean of technology at Harvard Medical School, Halamka took the reins as editor-in-chief of Blockchain in Healthcare Today, a new peer-review journal dedicated to building a body of research for digital ledger technology.

HCB News: Are you currently involved in any blockchain research you can tell us about?

Dr. John Halamka: In early 2018, blockchain was at the inflated expectations peak of the Gartner Hype Curve. By the end of 2018 it migrated past the trough of disillusionment to the plateau of productivity for selected use cases. BIDMC has committed to three areas of inquiry:

a. Data integrity – how can you prove that a medical record was not changed, deleted, or amended? When an encounter is complete, create a “hash” or one-way mathematical digest of the record and write that hash into the blockchain. If anyone has questions about the completeness or integrity of a record, it can be provided by comparing the “hash” today with the historical hash recorded on the blockchain.

b. Provider Credentialing – today there are over 1,000 insurance companies in the U.S. Clinicians must submit credentialing data to each insurance company from which they seek payment. It’s a huge administrative burden. A number of collaborators are building a blockchain-based credentialing tool so that data can be submitted one time to a trusted ledger and then all payers can pull data from that ledger, reducing cost and burden.

c. Consent – The U.S. has 50 states with 50 different privacy and consent policies. We believe that recording consents on the blockchain instead of in each EHR will enable transfers of patient data while respecting patient preference via querying a public ledger before each exchange. This work is part of the MedRec project, which you can learn about at https://medrec.media.mit.edu.

HCB News: As blockchain applications emerge in healthcare, how will providers interact with them? Is there a level of training that will be required or will it be behind the scenes?

JH: Blockchain is an infrastructure component. The tools provided by blockchain developers are hard to use and require more steps than an average human can navigate. Uses of blockchain in healthcare need to be invisible to the user. The ideal application hides the complexity while still enabling the benefits of a public ledger.

HCB News: What are some of the tools for blockchain in healthcare that already exist?

JH: Companies such as Simply Vital Health, Embleema and Optima Curis, (I advise all of them) have created applications on top of blockchain to address data sharing challenges without adding complexity. Simply Vital Health’s tools are open source, encouraging developers throughout the world to leverage their easy-to-use care coordination tools based on blockchain.

HCB News: Do you feel there are major misconceptions about blockchain and what it could mean for healthcare?

JH: Blockchain can be slow, cumbersome, potentially expensive (energy costs), unscalable and limited to small amounts of data. It will not replace existing databases, solve interoperability problems, provide a solution to identity management challenges (i.e., who is the patient), be useful for analytics or replace existing architectures. It’s an adjunct to what we already do, providing some utility for use cases requiring trust.

HCB News: Looking ahead to the next 5 or 10 years, how can you imagine blockchain changing healthcare?

JH: As mentioned before, the most likely use of blockchain will be for helping solve problems associated with the trustworthiness of data. Since blockchain is not operated by government or a corporation, the trustworthiness of information recorded on the chain transcends politics and policy. I really believe that consent management using distributed public ledger technologies has real potential.

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Q&A with Dr. John Halamka
Demystifying the potential of blockchain to improve data management in healthcare

By Gus Iversen
Improving EHRs

Penn Medicine has introduced an initiative to help transform EHRs into the streamlined, intelligent and interactive tools that clinicians have always wanted them to be. By prioritizing the needs of providers, who are increasingly burdened by the demands of data entry, they are looking at ways to rethink EHRs as an integrated element of care delivery rather than merely a documentation system.

HealthCare Business News spoke to Dr. David Asch, executive director of the Penn Medicine Center for Health Care Innovation, to learn more about the initiative and its goals.

**HCB News:** Making EHRs more physician-friendly is no small task. What can you tell us about your own background with health records and what led to this initiative?

**Dr. David Asch:** Most members of our team are clinicians, and that’s critical. But members of the team also have three other essential skills, including software development, design, and behavior change. And pretty much everyone has at least three of those four.

The clinical sensibilities are so critical because we are ultimately solving for the best patient outcomes. And often the best way to solve for patient outcomes is to develop tools that are effective for clinicians. If you are in the business of making scalpels, you want those scalpels to be useful to the surgeons who are operating on patients. If you are in the business of building electronic medical record systems, you want those systems to be useful to clinicians caring for patients.

Right now, the clinicians are complaining that contemporary EHRs are not so useful. We think they can get better with skills from clinical medicine, software development, design, and behavior change.

**HCB News:** It seems paradoxical that EHRs would present new challenges to workflow when we’re so accustomed to technology making our lives simpler. Why are medical records such a glaring exception?

**DA:** Technology certainly has that opportunity to simplify – it comes down to what it was designed to accomplish. Early EHR development focused on meeting administrative standards for documentation and billing. The unrealized value still awaits, as far as designing technology that can now also enable clinical care to be more frictionless, informed, and coordinated.

**HCB News:** To what extent are the problems with EHRs provider based, as opposed to vendor/software based?

**DA:** The answer is of course both, but I will take sides here for emphasis. The problem is vendor/software based. Yes, clinicians – like all humans – are reluctant to change. But better designed software would have been designed around them in the first place so they wouldn’t have to change much. There are close to a million physicians in the U.S. alone and just a handful of software vendors. Wouldn’t it make more sense to move the software rather than the physicians?

**HCB News:** Can you tell us about the progress you’re making with reimagining EHRs?

**DA:** Well, we’ve done a lot better at reimagining EHRs than turning those dreams into reality. This is hard work. But current EHRs are not the products of imagination. They are the products of taking what we already had and digitizing it. The EHR knows to flag a certain hemoglobin level as abnormal, but not to compare it against historic values for that patient, check the mean corpuscular volume, reticulocyte count, and offer suggested next steps. Nor can the EHR automate. It cannot tell me that a patient I was worried about missed her last lab test and cancelled their office appointment, or better yet reach out to the patient to ask why.

**HCB News:** In the future, how might a physician’s interaction with the EHR be different than it is now?

**DA:** Much less of it! Hopefully the EHR becomes an extension operating in the background – a functional and cognitive relief in care delivery. The perfect EHR would be like my mitochondria: busily working in the background, but I am glad they are there.

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Q&A with Dr. David Asch
Executive Director of the Penn Medicine Center for Health Care Innovation

Making medical records more like the mitochondria

By Gus Iversen
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Forward Thinking

When IT systems integrate, value-based care can take flight

By Mark Tomaino

Before the Affordable Care Act, a medical practice management system (PMS) was used by physicians primarily as an office administration tool to capture patient demographic and billing information, schedule appointments, maintain lists of insurance payors, perform billing tasks and generate reports.

The passing of the ACA, which included the HITECH Act’s stimulus, incenting physicians to adopt and make meaningful use of a certified electronic health record (EHR), led to the integration of an EHR with a PMS. This system integration enabled physicians to address both clinical and administrative needs of medical practices, and allowed physicians to see a patient from both a financial and clinical perspective.

Prior to the integration of a PMS with an EHR, the administration of a medical practice could be compared to the “horse and buggy” era, with manila folders and appointment reminders sent via the U.S. mail. The adoption of EHRs was tantamount to “paving over the cow path” in terms of its basic transformation of paper files to digital information management. The integration of a PMS with an EHR, which enabled clinical information access and exchange in tandem with patient administrative data, was the equivalent of building the healthcare information highway’s “on and off ramps” for sending and receiving digital information and EHR data management.

So where do we go from here? Improving the cost and quality of healthcare for patients will be dependent upon effective care coordination and collaboration between clinicians, their staff and patients armed with the digital information within the EHR and PMS. The transition from fee-for-service reimbursement of physicians to value-based payments, where quality and outcomes will increasingly take precedence over volumes of procedures and encounters, will demand that clinicians and administrators regard their medical practices as patient communication and engagement hubs.

Air traffic controllers and health IT

While ACA provided the catalyst for the digitization of patient encounters and information exchange, outcomes-based healthcare will require medical practitioners to enable their administrative and clinical staff to function more like air traffic controllers than pedestrian crosswalk attendants.

The task of “navigating patients on their journey to satisfactory health outcomes” will require information and communication technologies that resemble the sophisticated systems managing and coordinating preflight, take-off, flight plan, and landing requirements for myriad aircraft representing multiple airlines with different flight plans. The capabilities required by clinicians to care for disparate patient populations representing myriad health conditions dependent upon adherence to multiple care plans delivered across different venues will require a hub-and-spoke network connecting primary care physicians with specialists, and acute care hospitals with post-acute facilities.

The transition from fee-for-service to value-based payments will demand that clinicians and administrators regard their medical practices as patient communication and engagement hubs.

Patient “preflight requirements” in a value-based world will require having real-time access to a patient’s longitudinal health record in addition to eligibility and enrollment data. Patient “takeoff” will require transparency about treatment alternatives, and cost and quality differentials. Patient “flight planning” will demand understanding of and compliance with care protocols, and a clinician’s ability to trigger the “fasten seat belt sign” in between physical encounters.

In a value-based world, a physician’s ultimate “landing requirement” for a patient will be a satisfactory outcome. Optimizing profitability of medical practices in a world of performance-based payments will require new and different “navigational systems” to guide patients on their healthcare journey.

In order to truly replicate an air traffic control system for population health management, clinical data must be extracted from disparate patient record systems, and curated into longitudinal patient records that enable providers to identify gaps in care with an ability to trigger a course correction on a real-time basis.

A road paved with evidence-based protocols

While the HITECH Act was a central catalyst for EHR implementation, legislators and regulators will increasingly turn to quality and value
initiatives, rather than mandatory adoption of technology. For example, the Medicare Access and CHIP Reauthorization Act of 2015 (MACRA) and Merit-based Incentive Payment System (MIPS) will drive change in the healthcare reimbursement landscape with the objective of delivering more value for the same cost, realizing improved outcomes, or same outcomes at a lower cost. The mandated assumption of risk (e.g. payment for value) will drive the use of technology as a practical matter.

Quality will ultimately be assessed by measuring adherence or deviation from evidence-based protocols, which will help eliminate unwarranted care – the greatest driver of cost.

Payment transformation will drive innovation in the ways that care is delivered – as more providers assume financial risk, which is inherent in outcome-based payment methodologies, demand for health IT solutions that increase productivity and deliver clinical decision support should increase. Healthcare technology’s promise will be the efficient and effective delivery of care so that providers that assume risk embrace quality-based payment methodologies.

In such an environment, emerging health IT vendors should explore indirect commercialization opportunities such as partnering with larger, well-established firms that have existing customers, but may lack the specific capabilities and solutions that emerging firms possess. Speed to scale will be a success driver, and firms that are willing to collaborate (versus a “go it alone” mentality) will willingly trade margin for volume in order to acquire customers in as efficient a manner as possible.

**Toward the creation of patient radar systems**

The integration of a PMS with an EHR has allowed clinicians to interact with and report clinical and financial information as other than disparate, disconnected data sets. Looking toward the future, these tools must be transformed into a “patient radar system” with new levels of connectivity, tracking, engagement, education and decision support likely beyond the core competency of legacy PMS and EHR vendors. Hence, the medical practice of the future will be reliant upon technologies that emerge from new forms of collaborations between legacy EHR and PMS vendors, and best-of-breed solution providers that deploy cloud-based tools to integrate and seamlessly exchange information with existing systems.

In a value-based healthcare market, technology that sustains a network of interconnected clinicians that track and manage a patient’s health status, automate the development and distribution of care plans and monitor patient compliance with treatment protocols will be as commonplace as air traffic control systems. Clinicians and administrators will demand these capabilities in order to “clear patients for satisfactory outcomes” as they pursue their healthcare journey.

About the author: Mark Tomaino joined the private equity firm Welsh, Carson, Anderson & Stowe in 2010 and is an operating partner focusing on investments in the healthcare information technology industry. Mr. Tomaino was previously senior vice president, Corporate Development at The TriZetto Group. Prior to joining The TriZetto Group, Mr. Tomaino worked at Bausch & Lomb Incorporated in a variety of legal, strategy, and business development roles. Share this story: dotmed.com/news/45960
Radiology Information Systems

What will the right RIS solution bring to your imaging department?

By John R. Fischer

There is more to picking the right radiology information system (RIS) than just choosing a piece of software that comes highly recommended or fits the budget. Like so many tools in healthcare, the right RIS investment starts with looking in the mirror and figuring out what your unique needs are and how you plan to meet them.

“Most people do not seem to understand that to make it work takes a little bit of skill and a little bit of flexibility. You can pick a great tool but if you can’t implement it to keep your business going, health systems are going to cut their volumes or spend hundreds of dollars on a consultant,” RadNet CIO Ranjan Jayanathan told HCB News. “You need a product that you can take from presentations to actual use and implementation without destroying your business.”

And it’s easier said than done. According to Jayanathan, providers in the U.S. are replacing RIS solutions at a high rate because they are investing in tools that aren’t meeting their productivity demands.

Making the right purchase requires providers, both for radiology and now the hospital enterprise, to understand the type of solution that RIS is today, and the functionalities it possesses. It commands experience and knowledge in how to integrate RIS within a workflow and enable it to operate in conjunction with, and in support of, other systems and tools.

RIS has evolved

Originally designed as stand-alone system, RIS has historically overseen the management of orders for imaging studies and related documentation as well as billing, adminis-
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Radiology Information Systems

Choosing the best RIS solution for a practice requires an evaluation of the type of workflow and current technologies used there, as well as an understanding of what each vendor has to offer.

Radiology Information Systems (RIS) is a critical component of any imaging department, providing critical functions such as scheduling and ordering. Although they remain largely a stand-alone in international markets, RIS solutions in the U.S. are increasingly becoming a set of functionalities embedded within other types of systems.

“You could say in many cases that departmental RIS solutions were essentially cannibalized by a broader EHR solution that covered all administration, billing and order management across the hospital, with RIS a module of the wider EHR solution,” said Steve Holloway, principal analyst for Signify Research.

Meanwhile, according to Holloway, Picture Archiving and Communication Systems (PACS) systems also became more sophisticated, offering radiologists more tools for workflow and different specialties.

The combination of these two changes reduced the role of RIS as a stand-alone system in the U.S., where today, manufacturers primarily develop RIS as a set of “best-of-breed” functionalities embedded within enterprise imaging systems, broader radiology platforms and a variety of other products.

“We’re starting to see broader platforms for radiology covering workflow, QA, operational tools, and business intelligence, all of which are embedded RIS capabilities,” said Holloway. “It’s more of the best-of-breed functionality being spread and adopted into other products.”

Though steamrolled as a standalone by EHRs, RIS as a set of best-of-breed functionalities is growing as a competitor to EHR RIS modules, many of which are not as nuanced or sophisticated as the stand-alones they replaced in providing business intelligence and practice management.

As a result, the main use of RIS in hospitals has changed from that of a clinical workflow tool to one used mainly for administrative tasks, billing and scheduling. It also is used for preauthorization, ensuring that the process is completed seamlessly for all parties, from patients to payors to radiology business managers. “The purpose of the RIS, if nothing else, is to reduce as much friction as possible between various parties so they can be served,” said Jayanathan.

Assisting in these tasks is the incorporation of various forms of communication, such as texting and email. “There’s really been a push toward automation, whether that’s on the revenue management side or the patient check-in and the pre-visit workflow that needs to be accomplished for every imaging study,” said Tim Ninke, head of RIS implementation at MedInformatix.

What to look for in your vendor

For Christina Bronsky, the focus at her hospital was integration. The Advanced Patient-Centered Excellence (APeX) radiologist manager and enterprise imaging program manager was searching for a RIS solution that could integrate with the EHR system at the University of California, San Francisco to allow its clinicians to access different forms of data throughout the entire facility.

“There are a lot of niche systems out there that are much, much better than some of these enterprise solutions because they have the focus and care on that specific specialty,” she said. “Our focus was on integration because we wanted to see the same information across our entire organization and be able to easily flow patients through our system more quickly and in a way that enhanced their overall experience and satisfaction.”
The need to connect with and share information across multiple sites has left providers with the challenge of connecting together different types of systems, such as RIS, EHRs, PACs and VNAs, all of which, in many cases, are designed by diverse manufacturers to meet diverse needs.

Based on this reality, choosing the best RIS solution for a practice requires an evaluation of the type of workflow and current technologies used there, as well as an understanding of what each vendor has to offer.

“You want RIS technology from vendor partners that have other compatible modules or solutions whether they are PACS, VNAs or other products,” said Holloway. “You want the ability to integrate and interface with other systems, including legacy ones.”

Another factor to consider is size. While very small clinics or providers that only perform a small number of imaging exams may be able to get away with a rudimentary system, larger ones may need a fully-featured RIS depending on their type of workflow and the ability of their systems to manage it.

“If the system isn’t able to manage the full workflow for a department, there’s a need for RIS as a component, because it can manage the radiology department and its resources, providing specialized workflow management,” Leigh Dyment, technical product manager for Carestream Vue RIS, told HCB News. “It really depends on the other systems at the hospital and their capability. If the EHR has RIS capabilities for enterprise-like scheduling, the site is less likely to purchase a RIS solution. However, if sites need to do resource management across multiple sites and manage prioritization of imaging studies based on resources, EHRs typically don’t provide that functionality, which ushers in the need for RIS.”

RIS solutions should offer flexibility for business models such as subscription-based pricing and the re-sharing of contracts, as well as architecture, in terms of hybrid approaches and the ability to use it with the public cloud.

“You need to verify that RIS is flexible enough to accommodate both your current needs today, as well as the potential growth in size and scale and the extension of other functionalities in the future,” said Tse’ela Mida, worldwide product line manager for RIS and Information Systems at Carestream Health. “Don’t just look at what you have or what you need today. Look at what you need five or ten years from now and make sure your RIS solution can address your growing needs.”

The RIS systems of tomorrow

Providers today are turning away from multi-vendor environments and are more and more looking for single vendor solutions, while developers and manufacturers are looking to capitalize on emerging technologies to expand the sharing of vital information for their customers.

Though considered still far off, one specific area of interest is adoption of the cloud, with many large providers currently operating on a private cloud model from their own center, or even their own cloud. “The primary copy of the image is still stored on-site. We do expect that to gradually transition to public cloud over time, but not for a while,” said Holloway. “Once you see the big EHR vendors shift toward public cloud, systems like RIS or broader radiology will follow suit.”

He foresees RIS continuing to transition away from stand-alone to embedded, best-of-breed functionalities that are part of a broader radiology platform or one central operational system.

Worklist and scheduling will be the basis of that, but I think you’ll be seeing the addition of operational tools and business intelligence for radiology practice management being embedded,” said Holloway. “This will address many of the operational challenges facing radiology practices and help embed functions – regulatory, dose monitoring, staff quality and audit, utilization, dashboarding, service contracts – within one central operational system.”

Bronsky agrees, but sees RIS not just as a system for the radiology department five or ten years down the line but one for many parts of the hospital enterprise. “I think we’ll see it more commonly used in cardiology, ophthalmology, dermatology, pathology and other areas, providing the same functions that radiologists have been using for the past decade.”

In addition, the amount of information accessed and shared by RIS with other systems is anticipated to increase with the emergence of machine learning and artificial intelligence. Some influence of this technology has already taken effect over the past ten years, with new developments expected to build further on these promising inroads.

“When national initiatives, AI will help create a better overall picture of a larger number of studies and general population trends in health. RIS should be able to use that type of information with a decision support system that will help referring physicians make informed decisions about the types of studies that should be ordered for a patient,” said Dyment. “At the end of the day, it’s all about the health of the patient.”

Regardless of how RIS changes over time, one certainty is that it will continue to exist in some form that aids in the running of radiology departments.

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Although they remain largely a stand-alone in international markets, RIS solutions in the U.S. are increasingly becoming a set of functionalities embedded within other types of systems.
Moffitt Cancer Center secures radiology systems by ditching anti-virus software

By Dave Summitt

In healthcare, one of the most challenging areas to secure is the radiology department. The machines that interpret radiology scans and other medical images at Moffitt Cancer Center are regular Windows-based workstations running GE-PACS. They are connected to the network and can potentially be exposed to web-borne malware or threats that hide inside malicious email attachments, if or when employees use these machines to check their email.

Modern computer scanning equipment is designed to take pictures of large sections of the patient’s body in just seconds. The images need to be very detailed, doctors usually request to see multiple images at once, and they often need this information in real time. At Moffitt, we were using traditional anti-virus software on our workstations, but we noticed that it was causing substantial degradation in performance.

Because the AV had to scan every image as it came across before presenting them to the viewer, it was really slowing things down. In fact, it wasn’t uncommon for Moffitt’s radiologists and technicians to wait several minutes for each scan to come up. We quickly realized we needed to find a solution that would shield the machines from threats, known and unknown, while preserving usability and performance.

A new approach

I first learned about Bromium while I was CISO at the University of Alabama Birmingham Healthcare System. When it was first presented to my team there, it was kind of a “wow moment”. I fell in love the first day I saw it. It works by isolating web pages, emails, attachments and so on within micro-VMs, which means that the threat is instantly neutralized, as the hacker can’t get anywhere.

Upon moving to Moffitt, I brought my experience with Bromium with me as a tool to better understand what potential threats may be lurking in the Moffitt environment. Initially we began intentionally infecting a few select PCs to observe how threats unfold and how they behave throughout their life cycle. We reviewed the complete kill chain analysis, which gathered all available information about the threat to help us harden our cyber defenses.

Then it dawned on me; we already own Bromium, so why don’t we try to remove the anti-virus from the radiology machines and protect them in that manner? Our initial trial was successful, and today more than 30 of our critical radiology reading machines run Bromium.

Real savings and tangible performance improvement

Since removing anti-virus from the radiology workstations and replacing it with Bromium, we have noticed a significant improvement in machine performance. It doesn’t rely on scanning, so everything can be done in real time and we are confident that even if something nasty does get to a user we are still protected, as the threat will be isolated.

Removing the performance lag has increased staff productivity, helped our doctors make speedier decisions, and improved patient care efficiency. Our IT security and SOC operation teams can now quickly and efficiently determine the impact of incoming malware and begin remediation efforts before it becomes a larger issue. My next goal is to remove AV from our remote coders’ endpoints, as managing anti-virus updates for remote workers can be a challenge.

Sharing the experience with other healthcare facilities

Most of today’s medical facilities use machines that read radiology images, and they are likely to experience the same issues that we came across – these devices can’t be left unprotected, but anti-virus causes performance problems, which is unacceptable, especially when scans need to be read quickly to make swift decisions about patient care. There are great lessons to be learned here; the success we had will help other medical facilities because patient care and satisfaction is the utmost priority for all of us in the healthcare field.

About the author: Summitt is an industry veteran. He spent 21 years with the Department of Defense, before transitioning to the healthcare sector. In 2017, he was awarded the Information Security Executive Southeast People’s Choice Award, and his department’s Security Operations Center (SOC) was nominated as a leading project. More recently, Summitt has been brought in as a fellow to the Institute of Critical Infrastructure Technology, a national cyber-security think-tank and was recently invited to become a member for the Forbes Technology Council.

H. Lee Moffitt Cancer Center & Research Institute is a nonprofit cancer research and treatment facility located in Tampa, Florida. Moffitt is one of the only 49 National Cancer institute-designated comprehensive cancer centers, and is ranked No. 9 cancer hospital in the nation.

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Radiology has always been an early adopter of new technology. Speech recognition is no different. Since we started seeing research come in from radiology departments about speech recognition solutions, we’ve observed that at least 80 percent of radiologists use some sort of speech recognition solution. However, when it comes to other clinicians, those numbers drop significantly. Clinicians who use speech recognition to enable their EHRs are about 50 percent and adoption rates for pathologists and cardiologists are around 30 percent.

Over the past two and a half years, more than 1,600 individuals have contributed their thoughts regarding the critical elements of the speech recognition market to Reaction Data. These key decision-makers accessing our Research Cloud come from provider organizations across the country and are sharing their thoughts on how speech recognition technologies are helping them across their respective institutions. So, with that in mind, this article is meant to directly reflect their responses without analysis or opinion from us, so you get it straight from the source.

Additionally, in our most recent data across all areas, of those who are not currently using a speech recognition solution, about 40 percent indicate that they have no plans to adopt a speech recognition solution. On average, accuracy has been the largest issue cited for why they have not yet adopted one. Most are in a “wait and see” game, in the hope that accuracy and integration to their system improves before shelling out the cash.

Vendor mentions
Over the past three years, providers who use Nuance for speech recognition have been active in sharing their experience. When it comes to using speech recognition solutions for radiology reports and in documenting patient encounters in their EHR, participants who use Nuance comprise a strong majority, about 80 percent, in our Research Cloud. That number drops to 55 percent when you include the data for cardiology and pathology. The remaining participants are using (in order) M*Modal, Dolbey, IBM, nVoq, Voicebrook, Apple’s Siri, along with some homegrown solutions.

Replacement rates
If you’re a speech recognition vendor and have customers using your platform for radiology or their EHR, chances are good that you are safe from dealing with high customer churn. Both of those categories are reporting about 97 percent of customers who plan to keep their current solution. This leaves a scant 3 percent replacement market, which is some of the lowest numbers we’ve seen across any solution covered in the Research Cloud. However, Cardiology and Pathology are different. Both are showing about 70 percent of customers sticking around, leaving a much more wide-open replacement market of 30 percent.

Provider satisfaction
For the most part, both M*Modal and Nuance have good customer satisfaction with their respective solutions. From the providers in our research portal, M*Modal holds a slight edge with satisfaction in the EHR space, whereas Nuance has a slight edge in Radiology.

About the author:
Erik Westerlind is vice president of healthcare markets for Reaction Data, a leading source for outcomes-based research for the global healthcare provider, payer, and life sciences industries.

For more information about this research, the methodology, or other research currently underway from Reaction Data, visit www.reactiondata.com.

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Years ago, hospitals upgrading to a new PACS and archiving system had some fairly straightforward decisions to make. Purchasers – for the most part, just the radiology department – considered things like workflow, support and service and, of course, price.

These days, with the rapid increase in hospital mergers, a focus on the EHR, a shift toward enterprise imaging and a look ahead to the promise of artificial intelligence (AI), providers have much more to consider than they did just five years ago.

Dr. Rasu Shrestha, chief innovation officer at University of Pittsburgh Medical Center, noted that 2020 was always thought of as “the future” and “the future is here.”

Providers need to think about the strategy around imaging from an enterprise imaging perspective, looking at imaging “as an asset and enabler of strategies throughout the health system,” Shrestha said.

As a result, radiology departments today rarely make this decision alone.

“Decision-making has gone to the C-suite, but it’s important for radiology to have a seat at the table,” Shrestha said.

Learning to share

“Ten to 15 years ago, an organization would be looking for a PACS that met their own needs,” said Don Dennison, a consultant who specializes in imaging informatics.
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Imaging IT

"The most common pattern now is a shared system where multiple organizations use a single instance of PACS."

Four years ago, after Mount Sinai Medical Center merged with Continuum Health Partners, the system went through the process of switching PACS vendors. Continuum had a system from McKesson Radiology while Mount Sinai used one from GE Healthcare, which was ultimately awarded the new contract for the merged systems.

While the Continuum radiologists needed to get used to the new system, with its new user interface, it was important to move to one, said Dr. David Mendelson, associate chief medical information officer for the Mount Sinai Doctors Faculty Practice and the vice chair of radiology IT of the Mount Sinai Health System.

"In this age of mergers, harmonization is an important principle because it’s not feasible to support numerous different systems," Mendelson said.

Each organization may have a range of services, from trauma to general radiology, that have different requirements in terms of workflow.

The PACS and vendor-neutral archive also need to be capable of handling multiple patient IDs, a change from when more hospitals were independent.

That leads to the question of whether to upgrade to an enterprise PACS – a system shared among multiple facilities and specialties, including cardiology, neurology, ophthalmology and even dermatology – a vendor-neutral archive, or both.

It is important for healthcare organizations to consider the big picture of image sharing and viewing, according to Michael Gray, a consultant specializing in the digital management and distribution of medical image data, and decide whether or not they are ready to migrate to an enterprise viewing and archiving system.

For Gray, the challenge is analogous to being able to see the “forest from the trees” in the sense that if you don’t see the big picture it’s hard to invest in the right components.

If deploying an enterprise imaging system, facilities also must assess whether or not the components that will be supplied by the EHR are acceptable, according to Dennison.

“What if the reading worklist is incapable of providing advanced features?” Dennison said. “It’s not so much a technical incompatibility. It’s more about the parts that radiology users will be using – does it work and does it work well? If not, how are we going to mitigate it? Are we going to use third-party software?”

For example, a community hospital may have more general radiologists, while a larger health organization will often employ more subspecialty radiologists that require a specialized workflow.

“Some organizations take a lot of time to define their worklists very specifically,” Dennison said. “Often, two or more rads will share a worklist. If the reading worklist logic isn’t very sophisticated, it requires a person, like a radiology coordinator, to manually assign cases. Radiology needs to be engaged in the decision about the reading worklist application that will be used, or risk getting whatever IT thinks is best.”

Dr. Eliot Siegel, chief of radiology and nuclear medicine for the Veterans Affairs Maryland Healthcare System, said that while it’s critical that IT is part of the team that makes the decision on the PACS and archive system, it’s equally important that radiologists, who have important training, be involved in decisions regarding medical imaging.

Radiologists need to consider computer monitors and brightness, and also how peer review – in which radiologists judge each other’s interpretations – is done.

“It’s imperative that a new PACS system be able to do that,” Siegel said.

This means that while radiology departments may take a back seat to IT, they still need to help navigate the decision.

“For many years, radiology would buy their own systems,” Dennison said. “Now, when components are supplied by the EHR, they’re not going to the vendor. I’ve seen radiologists who are a little too trusting that the right thing will happen, and it doesn’t. You’re relying on other groups for your success.”

However, when implementing an enterprise system, the special considerations don’t only extend to radiology.

“Radiology people don’t have a full perspective of the imaging needs of non-radiologists,” Gray said. “IT needs to think, ‘how are the new generation of EHR users going to visualize images?’”

Healthcare organizations also need to think about what kind of images may need to be securely viewed and archived, such as iPhone photos from dermatology or a burn unit, Gray said. They also need to think about their budget now and what they might lose by waiting to move to an enterprise system.

“Ask all the questions,” Gray said. “What do we want to put in this, aside from radiology pictures? … You need to understand the big picture and understand the timetable to achieving it,” Gray said. “Once you have decided that you understand that, then how long are you going to give yourself to get there?”

It’s also important for many other non-clinical teams to now be involved in a PACS purchase.

“There should be input from risk management, teams that look at communications, infrastructure,” Siegel said.

Facilities also need to consider future imaging needs when planning a PACS and VNA switch.

“If you have a 16-slice CT scanner and you know you’re going to 128, that means thousands of images,” said Cris Bennett, a PACS specialist with MD Buyline. “You really have to look ahead, budget wise.”

Planning the transition

With so many stakeholders involved, it is important to plan for a transition to a tightly integrated and/or single new system, which is likely to be more complicated than one hospital switching to a new PACS vendor.

After the merger four years ago and switch to the new PACS, the two New York City health systems are “still migrating the data,” said Mendelson of Mount Sinai.
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Large health systems converting to a new PACS and VNA need to look at the “quality and consistency” of the data they’re migrating, Dennison said. Procedure descriptions can differ from hospital to hospital.

“Everyone’s calling the same exam by a different name,” Dennison said. “You have to convert all of the historical values, and you can have thousands of unique descriptions per site. Or you create a mapping, which is more complex. It has a big impact on productivity. A lot of organizations, in the rush to convert, have to spend a lot of time cleaning up after the migration to get their software features to work as they want them to.”

Dennison said there are a number of data migration service providers who can help with the data conversions.

“They have an understanding of it and they can give you guidance on the best techniques,” Dennison said.

Bennett said it is important to note that “there’s always loss of data” during a transition.

“There is just so much more data and more images” these days, Bennett said.

**Attention to workflow**
It is increasingly important for radiology departments to more broadly consider how PACS features fit into a radiology workflow.

“Think not just about bells, whistles and tools, but how to integrate more tightly into the overall workflow, adding value beyond a stand-alone application, such as a liver lesion management tool,” Shrestha said. “At the same time, they’re not really connected to the rest of the workflow.”

It’s also important to bring in additional context, called image-related clinical context, about patients from the EHR, Shrestha said.

“At UPMC, we’re working with GE to specifically bring in context,” Shrestha said.

Sometimes, integration into the EHR just isn’t in the budget. David Alexa, RIS/PACS administrator for the Dickinson County Healthcare System in Iron Mountain, Michigan, said that when upgrading to Carestream Health’s Clinical Collaboration Platform in October 2017, they weren’t able to add EHR integration.

Instead of viewing images directly in the EHR, in-network physicians log on to a different system to view the images after reading the radiologist’s report in the EHR. If patients are transferred to an out-of-network facility, images are shared using a virtual private network, a secure tunnel between the two sites that allows DICOM traffic.

“It’s more of a workflow issue,” Alexa said. “But we haven’t gotten any complaints because they didn’t have that functionality before.”

However, physicians in the Dickinson County Healthcare System do have the added functionality of being able to view images on their mobile devices with a zero-footprint viewer.
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On the ground or in the cloud

Another big consideration when upgrading is whether to have on-site storage or use the cloud.

Michael Cannavo, an imaging IT consultant, said that while a lot of facilities are embracing software as a service so money can be taken from the operating budget instead of more limited capital budgets, he recommends that facilities don’t rely 100 percent on cloud storage.

“If the network connection to the cloud goes out for any reason, it’s like the engine being taken out of your car,” Cannavo said. “You need a hybrid system, with a small-scale server on-site.”

Hospitals, especially in rural areas, also need to factor in the availability of high-speed networks, in order to have a cloud-based system that runs on the same speeds as one on-site.

“Anything less and you may impact workflow,” Cannavo said.

Radiology departments may also want to invest in their own backup networks to prevent downtime, Siegel said.

“Downtime significantly impacts work in a radiology department,” Siegel said. “It’s important to have contingency plans to allow us to operate independently when we need to. … Before purchasing systems, look at that level of vulnerability. The hospital is so dependent on imaging. Having radiology at least be able to continue operations within the department itself is really critical.”

Alexa of the Dickinson County Healthcare System said that when upgrading, they went with a hosted system to ensure that exams loaded quickly.

“We feared if it was out in the cloud, our doctors might not be happy with the speed at which they were loading,” Alexa said.

Facilities also should realize that burning a CD may become extinct, as most new computers don’t come with CD drives.

“Image sharing is a big deal,” Cannavo said.

Making room for AI

While AI still seems like a tool of the future, forward-thinking imaging departments need to look ahead and consider how algorithms can be integrated into the radiology workflow.

“We’re already using AI-based capabilities around clinical decision support for lung nodules and liver lesion management,” Shrestha said. “It’s there, but there will be a lot more yet that will come down the pike. And AI, done right, will be much more tightly integrated into the very fabric of the clinical workflow.”

Siegel said there are a large number of innovative startups creating AI applications. While many of these AI vendors allow radiologists to interface with the applications via a web portal, it’s not the ideal solution for a radiologist who wants to use many applications.

“The PACS vendors themselves need to allow their users to interface with these AI systems,” Siegel said. “Although AI vendors need to have ability to interface with workstations, they shouldn’t have to come up with a complete set of interfaces for all types of PACS. I think the solution, moving forward, will be the ability for radiologists to pick best-of-breed AI applications that are part of their workflow, with the ability to be able to designate certain types of studies for certain types of AI applications.”

This also means that radiologists and healthcare providers will have even more to think about when it comes time to purchase a new system in the years to come.

“There’s no doubt that PACS is going to look different in five to 10 years than it does now,” Siegel said.

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Q&A with Christopher Ross
Chair of HIMSS North America Board of Directors

By Sean Ruck

With the annual HIMSS Conference and Exhibition fast approaching, it’s time for our yearly interview with society leadership. This year, chair Christopher Ross provided the answers to our questions, to paint a picture of how he came to lead HIMSS this year, some of the hot topics on the minds of members, and his take on a few other topics of note.

**HCB News:** What inspired you to follow a career in healthcare?

Christopher Ross: Honestly, healthcare was kind of my midlife crisis. When I was 43 a friend recruited me to work at UnitedHealth Group. I had previously been a congressional aide, a CFO, and a tech entrepreneur, and he kind of had to twist my arm. Then, unexpectedly, the opportunity to be CIO of the behavioral health division at UnitedHealth became available. This was of great personal interest to me, so I leapt at the opportunity.

I feel truly blessed by that moment of serendipity. Healing people and improving life is one of humankind’s great achievements and struggles. I have no aptitude or capability whatsoever to be a clinician, and I am in awe of them. But I can serve in a supporting role as a health IT professional, promoting better health through information and technology.

**HCB News:** How long have you been a member of HIMSS and why did you join?

CR: I joined in 2006, when I became CIO for MinuteClinic. I was a healthcare newbie, and knew nothing about the provider side of healthcare. I thought HIMSS would be a great way to learn from people who actually knew something; it’s turned out to be one of the best resources I’ve found for navigating this complex and incredibly important industry.

**HCB News:** What inspired you to become a leader in the association?

CR: I think I approached it with the idea that healthcare is a community and not the endeavor of one institution at a time. So since I started in healthcare, I have been participating in industry events and activities. That led me to the opportunity to be a candidate for the board of HIMSS.

**HCB News:** Was there anything surprising to you when it came time to lead the society?

CR: I think what didn’t surprise was the depth and commitment of the individual members and chapters. HIMSS is a membership organization and really thrives on the commitment of tens of thousands of professionals who contribute.

I think the thing that surprised me was the degree to which there was common interest in health IT around the globe. And HIMSS has a real opportunity to help extend that cooperation between health systems around the world. There’s a lot we can learn from each other and there are lots of ways we can advance if we work together.

**HCB News:** What are the main challenges facing HIMSS members today?

CR: I think the challenges start with daily operations, including safety, security, privacy, affordability. Given the complexity of our industry, for most of us, it’s a big deal just to have everything work well every day. Healthcare on the provider side has gone from mostly paper to mostly digital in about 10 years, and we’re just absorbing that as an industry. There are new regulatory challenges, horizontal and vertical mergers in healthcare, pressures on reimbursement, an aging population in most countries – a lot of demands.

At the same time there are exciting new challenges that come from applying modern technologies to healthcare. Things like cloud operations, software-as-a-service generally, advanced analytics, machine learning, and artificial intelligence. Plus, on the clinical side, there are new patient technologies in imaging, laboratory medicine, precision medicine, and other domains, and a whole new generation of mobile and implantable devices. Finally, there are new entrants in healthcare coming from Silicon Valley and consumer products and services companies who have new and potentially disruptive and popular ideas.

Leaders of technology in healthcare will be hard-pressed to find the right balance between maintaining steady operations needed for patient safety and affordability, and the need to innovate and disrupt, sometimes while “in flight”.

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Leaders of technology in healthcare will be hard-pressed to find the right balance between maintaining steady operations needed for patient safety and affordability, and the need to innovate and disrupt, sometimes while “in flight”.

Q&A with Christopher Ross
Chair of HIMSS North America Board of Directors

By Sean Ruck
HCB News: What initiatives are you championing as chair?
CR: This is an important transitional time in leadership at HIMSS with a relatively new CEO in Hal Wolf, and a brand new chief of the Americas in Denise Hines. The first job of the board, and the chair, is to help HIMSS leadership make good decisions about initiatives and programs for the benefit of HIMSS members and others in the HIMSS community.

I’m very focused on maintaining the HIMSS Vision – Better health through information and technology. Last summer I was diagnosed with a stage 3 cancer, and I’ve been on a very personal journey through healthcare. It’s given me a new perspective on what works and doesn’t work for caregivers and patients. As chair I want to champion our focus that we are doing all of this in the interests of the patient, and to support the clinicians who care for them.

HCB News: Is there any federal policy work HIMSS is currently pursuing?
CR: With the HIMSS mission focused on how health IT is enabling healthcare transformation, our work with federal agencies and Congress covers a lot of ground across our entire community of providers, developers, innovators, and patients. HIMSS was integral in securing enactment of the groundbreaking 21st Century Cures Act in late 2016, which was focused on modernizing our healthcare innovation infrastructure. Much of our policy work is focused on implementation and oversight of 21st Century Cures – on issues such as facilitating greater interoperability and data exchange across the care continuum, addressing clinician burden issues to ensure that providers have more time for face-to-face interactions with patients, and developing a broader regulatory framework around health IT. Additional topics that we are working on that are critical to the community are telehealth and the public health infrastructure, access to quality care, and cybersecurity.

HCB News: Last year, immediate past-chair Denise Hines predicted cybersecurity would be the prime discussion topic at the show with AI, precision medicine and interoperability other big topics. What are your predictions for this year’s show?
CR: Denise was right (she always is), so cybersecurity, AI and interoperability will be big topics for a few years to come. For this year’s show, I think we’ll also see a diversification of participants, which is exciting. We’ll see more attendees from outside North America as the interest in HIMSS continues to spread globally. We’ll see diversification in the vendors who attend. Over the last few years, in the HITECH meaningful use era, pretty much everyone was focused on the same big questions at the same time. I think the increase in diversity will mean lots of interconnected themes and conversations, and not one or two big discussion topics on everyone’s minds.

HCB News: Is AI a front burner issue or back burner a year later?
CR: AI in healthcare is a real thing that’s being used now. For example, there are basic uses like computer-assisted coding, or voice recognition dictation. Those take costs out of healthcare systems and improve productivity and performance.

The parts that are on the clinical side right now are probably more aimed at discovery, where researchers are using large data sets and AI to generate hypotheses and findings. I think what everyone is sort of looking for is when will those tools become part of the physician’s toolkit or appear at the bedside? And we’re already seeing that in areas like radiology, genomics, lab medicine and other areas. The level of interest by the manufacturers and innovators is really high. The amount of capital available to commercialize these breakthroughs is significant. So I think we’re going to see more mainstream AI in healthcare in the next two to three years.

HCB News: What are you most looking forward to about this year’s show?
CR: The opportunity to connect with so many peers, and make new connections, over the course of a few days is something I can’t get anywhere but at HIMSS Global Conference. I always make a point to visit the innovation showcase and interoperability showcases, which are working on some of the most important challenges in health IT. I like to spend a lot of time with new startups that are full of fresh ideas.

HCB News: Thinking about the next five to 10 years, what will be the biggest changes in health IT?
CR: There are some immutable changes that are affecting all industries, like the rapid move to cloud and software-as-a-service computing, and the introduction of AI and advanced analytics. I think privacy will be challenged and redefined as we see several of the global social media companies under scrutiny for privacy practices and the secondary use of data. The European General Protection Data Protection regulations may be the tip of the iceberg.

But more than anything else, I think the most major changes will come as health IT becomes networked and interoperable. We have just completed the “automation” phase in our industry as paper has been replaced by EHRs. Next we are going to start connecting those EHRs directly or through intermediaries. A lot of those EHRs are going to be in the cloud, making networking and interoperability substantially easier. Every other industry that has become networked has experienced significant disruption and innovation – think retail, finance, manufacturing, entertainment, on and on. We should expect to see significant changes in the role and composition of health IT departments, the kinds of services we will consume, and a broadening in the range and depth of competitors and innovators we encounter. My hope is that we will collectively keep our eyes focused on the needs of the patients; if we do, this new era in health IT may contribute greatly toward human health and wellness.
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<th>PAGE</th>
</tr>
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<tbody>
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<td>Inside Back Cover</td>
<td>Core Sound Imaging</td>
<td><a href="http://www.corestudycast.com">www.corestudycast.com</a></td>
<td>65</td>
<td></td>
</tr>
<tr>
<td>Aegys</td>
<td>13</td>
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<td>29</td>
<td></td>
</tr>
<tr>
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<td>47</td>
<td>Fuhua Electronic Co.</td>
<td><a href="http://www.fuhua-cn.com">www.fuhua-cn.com</a></td>
<td>16</td>
<td></td>
</tr>
<tr>
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<td>11</td>
<td>GE Healthcare</td>
<td><a href="http://parts.gehealthcare.com">parts.gehealthcare.com</a></td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Amber Diagnostics</td>
<td>14</td>
<td>IBM Watson Health</td>
<td>merge.com</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Avantehs.com/ultrasound</td>
<td>19</td>
<td>Image Technology Consulting</td>
<td><a href="http://www.imagetechnology.net">www.imagetechnology.net</a></td>
<td>17</td>
<td></td>
</tr>
<tr>
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<td>63</td>
<td>JVCCKENWOOD USA Corp.</td>
<td><a href="http://healthcare.jvc.com">healthcare.jvc.com</a></td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>MAVIG</td>
<td>33</td>
<td>Medinformatix</td>
<td><a href="http://www.medinformatix.com">www.medinformatix.com</a></td>
<td>53</td>
<td></td>
</tr>
<tr>
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<td>Back Cover</td>
<td>Nationwide Imaging Services</td>
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<td>4</td>
<td></td>
</tr>
<tr>
<td>Philips</td>
<td>57</td>
<td>RamSoft</td>
<td><a href="http://www.ramssoft.com">www.ramssoft.com</a></td>
<td>69</td>
<td></td>
</tr>
<tr>
<td>Richardson Healthcare</td>
<td>31</td>
<td>Siemens Healthineers</td>
<td><a href="http://usa.siemens.com/share360">usa.siemens.com/share360</a></td>
<td>1</td>
<td></td>
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<tr>
<td>Varex Imaging</td>
<td>2</td>
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In 2013, Trafton Drew, then an attention researcher at Harvard Medical School, conducted an experiment designed to test the theory of “inattentional blindness”, which occurs when people fail to see an object that is in plain sight because they were too focused on looking for something else. He did this by superimposing a matchbook-sized picture of a man in a gorilla suit onto a series of slides radiologists typically look at when they are screening for cancer. Ultimately, 83 percent of the radiologists did not see the gorilla.

The experiment is a prime example of the power of humans to focus so intently on a specific task – in this case looking for lung nodules – everything else we see can be filtered and shaped by that focus. It’s also a compelling argument for the potential of artificial intelligence (AI) in imaging.

It is our premise that radiologists are very good at finding what they are looking for but not at finding what they aren’t looking for. Radiologists are incredibly proficient at spotting lung nodules. Industry-wide, the miss rate for radiologists looking for specific abnormalities is just 3-5 percent. But that doesn’t mean they are seeing everything.

The near-term potential of AI is to build a safety net that lets us identify the high-value signals that might otherwise not have been the focus. Longer-term, the technology has the potential to revolutionize precision medicine and improve patient care. Make no mistake, a lot still needs to happen before that long-term promise is fulfilled. But many of the critical building blocks are already in place today.

For example, right now, today, we are able to use natural language processing technology to read clinical text from electronic health records (EHRs) and progress notes to identify, categorize, and code unstructured data and turn it into actionable, quantifiable insights on a patient chart. That data is allowing us to highlight potential discrepancies in documentation and provide valuable clinical context to physicians during image interpretation.

This is a critical first step. Researchers from the Medical College of Wisconsin recently found that when radiologists had the time and access to patient charts, they would change their findings between 20 and 25 percent of the time. There is data locked in the patient’s chart that can be critical to a diagnosis.

The next step – which is being tested with radiologists around the world today – is leveraging those text analytics to inform care decisions. Initially, our work here was focused on specific organs, but it is evolving quickly to address specific conditions within entire body systems. What that means is that our technology will soon be able to screen chest X-rays and chest CT scans to help clinicians identify conditions such as emphysema and COPD, aneurysm, pulmonary embolism, pneumonia and others.

We are entering a new world of precision medicine and imaging will play a large role in the evolution. As these technologies and science evolve, they will enable image-based biomarkers that, coupled with liquid biopsies, can be used to identify signals that are consistent with disease.

While it’s tempting to focus on that long-term potential, the most exciting developments around AI in imaging are actually those that are taking shape today. By carefully nurturing this technology, partnering with healthcare providers around the world to train and test it, and aiming for consistent improvements in workflow processes, we are putting the pieces in place that will enable a real, sustainable revolution in healthcare.

About the author: Steven Tolle is the vice president of global strategy and business development for IBM Watson Health.

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