BY INGA STEVENS

In post-PACS world, ECR 2017 exhibitors demonstrate how to realise full potential of healthcare IT

Since the first mumblings of the term 'picture archiving and communications system' were heard in the late 1970s, PACS has become mainstream in the practice of radiology.

The Clinical Collaboration Platform from Carestream assists with the acquisition, management, and consolidation of islands of systems and presents a single point of access to patients' clinical records.

Cinematic volume-rendering technique: high-resolution diffusion tensor imaging shows very detailed white matter fibre track. Copyright: Max Planck Institute, Leipzig, Germany. Provided by Siemens Healthineers.

In the early days of digitalisation, European hospitals and healthcare suppliers played a central role in the development of the technology. Today, many of the world's leading manufacturers are at ECR 2017 to display their latest PACS and healthcare IT offerings. The emphasis is on faster network connections, increased storage, 3D capabilities and monitors with higher resolution.

Sectra is demonstrating enhanced PACS capabilities designed for high-production environments with usability and availability in focus. Highlights include functions to speed up oncology workflows, such as lesion tracking and anatomical linking. Additionally, Sectra Breast Imaging PACS can support fully integrated breast tomosynthesis reading as well as MRI integrated within the mammography workflow. It also features strong workflow management tools, allowing efficient hosting of tumour boards and workflows being based on breast density. New enhancements include breast implant masking, further streamlined hanging protocols, and an integrated peer review package.

Carestream is showing several work-in-progress modules of its Clinical Collaboration Platform. The enterprise image data management product is designed to make critical patient images and data easily accessible to all stakeholders who collaborate in the continuum of care, including referring physicians, specialists, IT and business administrators, payers, and patients.

"Some of the work-in-progress modules that enable all stakeholders to collaborate include the expansion of Analytics Solution, which leverages natural language processing and semantic search technology to data-mine multi-media interactive diagnostic reports to detect discrepancies and reduce errors," said Massimo Angileri, EMEA regional business manager at Carestream. "In addition, the new deconstructed patient management workflow can be applicable beyond radiology for applications such as telemedicine, enabling zero-footprint deployment that can simplify system administration and improve access by remote users for wound care, tele-triaging and dermatology."

Also in progress is the introduction of new worklists for radiologists that can orchestrate daily reading workloads, enable real-time communication with peers and improve productivity, he added.

GE Healthcare is announcing several innovations in the enterprise imaging and cloud radiology sectors. The company is revealing the availability of the Centricity 360 Suite, which is designed to help distributed care teams collaborate efficiently on patient cases in a secure on-premise platform to optimise and simplify patient information exchange with primary care to improve care management.

Centricity 360 Case Exchange, Centricity 360 Physician Access and Centricity 360 Patient Access are the first applications in the firm's Centricity 360 suite of private/public cloud or data centre-based solutions.

"At ECR 2017, we will be showcasing analytics solutions across the GE Healthcare booth highlighting actionable insights for x-ray, ultrasound, CT, MR, enterprise imaging and cardiology," explained Bryan McGuinn, marketing director for GE Healthcare Digital. "Customers can place orders for custom analytics solution engagements and we are pursuing pilot opportunities for analytics applications."

Meanwhile, **Siemens Healthineers** is presenting a new version of the Syngo.via diagnostic software – the Syngo.via VB20 software assistant – which manages diagnostic findings to make all relevant data immediately available. The Cinematic Volume Rendering Technique (Cinematic VRT) available on Syngo.via VB20, also known as 'Cinematic Rendering', uses raw data from CT and MRI scans to create hyper-realistic anatomical images taking 3D imaging to a whole new level. While Cinematic VRT has been available to a small scientific group for the past few years, this is the first time the technology has been available as an application to all Syngo.via users.

The partnership and collaboration between **TeraRecon** and **Agfa HealthCare** is also on show at ECR 2017, as the companies present their release of an application programming interface (API) between iNtuition and Enterprise Imaging 8.1. This combined solution seeks to deliver a workflow that provides a complete clinical and imaging experience. The potential benefits include a single user interface for accessing 2D and advanced 3D applications, the ability to launch into TeraRecon workflow from within Agfa hanging protocol work-

continued on page 18

Cloud-based 3D reconstruction using TeraRecon's 3D Print Packs.

continued from page 17

flow, verification of patient information to ensure data integrity between Agfa and TeraRecon, and other benefits such as multi-series data loading for 3D analysis.

TeraRecon is also presenting its technological and workflow advances, resulting in the ability to print models of incredible detail directly from TeraRecon software. The new 3D Print Packs make online, cloud-based 3D reconstruction and printing simple, fast, and affordable, according to president and CEO Jeff Sorenson, who explains that the company has looked at the economics of 3D printing and concluded that there has to be a better way.

"Current in-house 3D medical printing programmes are too costly and complex," he said. "TeraRecon, together with WhiteClouds, is now offering a 3D printing online service with its new 3D Print Packs. Everyone knows that TeraRecon can make beautiful 3D renderings but now we can take those beautiful 3D renderings and go directly from DICOM to a 3D printed model, in a matter of minutes. What you see is truly what you get."

In other healthcare IT news, the evolving IntelliSpace Portal 9.0 analysis platform from **Philips** now incorporates applications to track and compare brain images to more accurately determine patient progression. In addition to enhancements in areas such as CT Brain Perfusion and MR T2 Perfusion, the analysis platform will offer longitudinal brain imaging (LoBI), an application for neuro reading to support the evaluation of neurological disorders over time so clinicians can monitor disease progression. Another feature is the inclusion of the NeuroQuant measurement application (CorTech Labs), which enables clinicians to quantify brain volume loss.

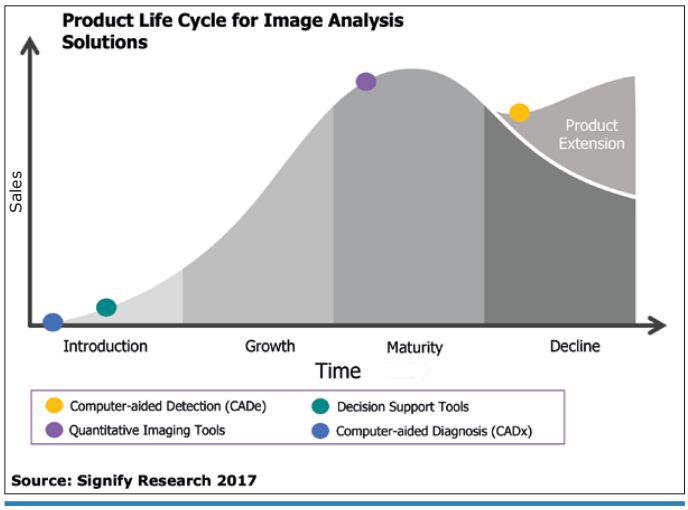
Technical Exhibition Opening Hours

Thursday, March 2 to Saturday, March 4 10:00–17:00
Sunday, March 5 10:00–14:00

BY STEPHEN HOLLOWAY

The great enabler: artificial intelligence in radiology

Much has already been debated over the impact of artificial intelligence (AI) for radiology, and now we start to see the first products enter the market.



Current maturity of image analysis solutions; AI is already penetrating CADe and quantitative tools; decision support tools just entering the market, while CADx remains some way from being implemented.

Most discussion has targeted the role of 'holy grail', automated differential diagnosis (or CADx), prompting a mix of scepticism, division and uncertainty from the radiologist community. Yet when we dig into the investment and development being made in AI for radiology, it becomes clear that AI will not replace radiologists, but enable them.

Efficiency

There is no getting away from it, radiologist physician numbers are dwindling and scan volumes rising, driving focus on efficiency. Digital technology has helped speed the imaging process, but this has not been enough to counter the ramp in demand and the complexity of imaging studies. Furthermore, complicated protocol management and changing structured reporting are putting radiologists under even greater pressure.

This is where AI can help. Work is already underway utilising AI to improve the back-end workflow issues that slow radiologist reading and reporting. It will over time 'individualise' the working platform for each radiologist, by learning and continuing to learn from how they work. This means soon imaging software will allow automatic, customised hanging protocols, smart reporting preferences, prior study recall and tool selection, based on the unique working practices of each individual user. Radiologists will be more autonomous, with fewer 'clicks' and far fewer workflow headaches.

What's more, with systems based on deep learning algorithms (rather than manually writing algorithms), vendors can make improvements and upgrades more quickly. Sound like science-fiction? It will happen sooner than you think. Our recent research with an extensive field of medical imaging AI companies predicts that close to one-third of image analysis software will be built on deep-learning algorithms by 2021.

Evidence

Quantification tools have been part of imaging IT software for some time, from coronary calcium scoring to lung density analysis. In offering quantification of imaging biomarkers, more accurate measurement of disease characteristics can be made. However, often these tools are manual, a time-consuming and inaccurate process. What's more, the development of the algorithms supporting these tools is manual.

By using deep-learning, the process can increasingly be automated, while the development of algorithms can be developed faster. The accuracy of this development process has yet to be tested in large scale clinical trials compared to today's manual solutions admittedly, but the range of quantitative tools in development is rapidly increasing. Therefore, expect to see a growing number of more automated, more accurate quantitative imaging tools coming to the market in the next five years.

Excellence

Quality of diagnosis is a continuing challenge for the modern radiology professional. While pains are taken to safeguard against adverse reporting, the volume of images to be read and limited radiologist capacity makes upholding quality standards a challenge. Due to digitalisation of health information over the last two decades, a raft of new clinical evidence is now available to the reading radiologist. However, there can be far too much information to review, leaving this potentially critical information unused. Here is where AI can again aid the radiologist: decision support tools.

These advanced machine learning tools can source, collate and pool all relevant clinical information together, in combination with quantitative imaging markers, to offer a more complete diagnostic picture to the reader. Furthermore, these systems will also be able to quickly pool evidence from similarly presenting past studies and outcome data, thereby providing guidance on likely outcomes of each diagnostic scenario based on prior outcome reporting. It is still early in market adoption for decision support tools, but some products are already approved for use in very specific study types, while a multitude of others are in development.

Of course, there are many barriers to overcome for widespread AI adoption in radiology. How to regulate continually learning systems? What are the legal and ethical implications? How will AI systems access patient data that is disparate and unstructured?

Despite these, the signs are clear that AI will have a transformative role in radiology. But rather than replacing the radiologist, it's more likely AI will be an enabler to more efficient, quality and evidence-based diagnosis. And sooner than you'd think.

Stephen Holloway is principal analyst and company director at Signify Research (www.signifyresearch.net), a health tech, market-intelligence firm based in Cranfield, U.K.