GE Healthcare at RSNA 2017
Digital
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At RSNA 2017, GE Healthcare is proud to showcase a broad portfolio of digital healthcare solutions that connect machines, people and data to help solve our customers' most pressing operational and clinical challenges.

To address the need for increased productivity, we are demonstrating machine-learning enabled features such as **Imaging Related Clinical Context (IRCC)** and enhanced reading workflows, all of which were developed in partnership with University of Pittsburgh Medical Center (UPMC).[1]

IRCC delivers relevant patient clinical content in context, including EMR data such as surgical notes, pathology reports and clinical notes, directly to the radiologist and embedded in their existing workflow. With a deep learning algorithm that learns as radiologists provide input, physicians will be able to more quickly reach a confident diagnosis based on a more complete picture of the patient's full medical condition. The new IRCC algorithm, expected to be available in 2018, learns directly from radiologists through semantic feedback (the relevance of certain key words and sentence structure) how to best select and present relevant clinical data when contemplating a diagnosis.[2]

GE Healthcare's patented deep learning-based **Smart Reading Protocols (SRP)** aims to ensure each radiologist's protocols are always automatically hung in the same way. SRP increases radiologist productivity by learning each user's or group's reading tendencies to automate image setup including launching advanced visualization and other applications.

GE Healthcare will also **demonstrate new machine learning algorithms built in partnership with leading academic institutions.** Examples include a pneumothorax detector currently being built with UCSF, which teaches machines to distinguish between normal and abnormal X-ray scans and prioritize cases in which the patient may be in critical condition, [3] and a stroke detector built with Partners Healthcare, which also aims to aid in radiologist worklist prioritization based on abnormal findings. We anticipate these applications will be commercially available in Q4 2018.[4]

GE Healthcare will also demonstrate a tool being developed with Boston Children's Hospital that aims to improve diagnostic accuracy in pediatric brain scans by providing real-time contextual information to radiologists that may indicate signs of normal development or potential disease in a child's brain.

Among the new product introductions within the portfolio is **Native Breast Imaging in Centricity™ Universal Viewer.** Today radiologists waste an estimated 19 percent of their time having to use multiple systems.[5] To address this challenge, GE Healthcare's Centricity™ Universal Viewer has been shown to increase reading efficiency by up to 40-50 percent at imaging centers around the world.[6] The new native breast screening and diagnostic workflows provide a single viewer which can be used for all

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1 *UPMC is a collaboration partner of GEHC and as a result, has a financial interest in the development and commercialization of certain GEHC next generation imaging products.*

2 *Any descriptions of future functionality reflect current product direction, are for informational purposes only and do not constitute a commitment to provide specific functionality. Timing and availability are subject to change and applicable regulatory approvals.*

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5 Radiologists' Burden of Inefficiency Using Conventional Imaging Workstations, Dr. Bruce Hillman and Dr. Bhavik Pandya, Journal of the American College of Radiology. November 2013.

6 Helimed Diagnostic Imaging Case study March 2014 (JB19543XX); Quantitative system data from Premier Bintaro Hospital; Frost & Sullivan analysis; Radiologists' Burden of Inefficiency Using Conventional Imaging Workstations, Dr. Bruce Hillman and Dr. Bhavik Pandya, Journal of the American College of Radiology. November 2013; CPACS Radiology Productivity Results Summary FINAL, Lean six sigma study, GE Healthcare 2010

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modalities. By utilizing patient priors, including CT, MRI and Tomosynthesis, as well as other patient reports such as clinical notes and pathology reports, in the diagnosis, Centricity Universal Viewer helps to increase workflow efficiency and support more confident diagnoses.[7,8]

GE Healthcare is also announcing the release of two new advanced clinical applications. The **CT Myocardial Perfusion application** has been added to our suite of advanced applications for cardiology. Advances include identification of moderate/significant stenosis, calcified vessels, occluded/sub-occluded vessels, qualitative correlation between SPECT and blood flow maps and quantitative correlation with PET blood flow values at rest/stress.

The **PROView application** offers a guided workflow for PI-RADSTM v2 (Prostate Imaging Reporting and Data System) standardized reporting of multi-parametric prostate MR exams. The report includes prostate and lesion volumes, sector mapping and scoring of MR images.

Enhancements to the existing portfolio of solutions include:

- **Centricity Imaging Collaboration Suite (CICS)**, a group of GE Health Cloud-based tools that help distributed care teams collaborate efficiently on patient cases in a secure and reliable manner, now includes an interactive 3D image viewer with full fidelity as well as the ability to navigate through findings and rotate 3D segmentations (MPR, MIP, MinIP, Average and VR). This development represents an important building block to the future of image post-processing as a service, so that customers can share algorithms with each other[9].
- Our latest generation of AW, **VolumeShare 7 (VS7)**, was designed to improve productivity and sharply reduce radiologist reading time of 3D exams. In a recent study[10], 11 customers in four European countries had their exam reading times measured while using AW VolumeShare 5 (VS5) and VS7. The average reading times for all AV exams was 20 percent less with VS7, and users reported faster exam processing times and streamlined workflows.
- **Centricity Cardio Enterprise** will feature new native stenosis and ventricular analysis tools[11], embedded **CardIQ™ Xpress Reveal** for CT angiography analysis, and the latest release of EchoPAC, v202 which includes expanded vendor agnostic capabilities.

Across the modalities of the booth, GE Healthcare will showcase the following healthcare analytics solutions to enhance customer's clinical, financial and operational decision-making.

- **X-ray Quality Application:** Analyzes machine data to track and trend X-ray repeat/reject rates, so administrators can conduct targeted technologist training in an effort to reduce unnecessary dose and cost and provide program audit readiness.
- **Radiology Operational Effectiveness (RIS/PACS):** Uses data from Centricity RIS-IC and PACS to provide actionable insights to Radiology Directors to optimize throughput, utilization and staffing, and monitor protocol compliance.

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[7] Diagnostic Accuracy of Digital Breast Tomosynthesis – Thick versus Thin Slices, Stork, RSNA 2015.
[8] Digital breast tomosynthesis: thick versus thin slices - clinical performance and reading time, Stork, ECR 2016.
[9] *Any descriptions of future functionality reflect current product direction, are for informational purposes only and do not constitute a commitment to provide specific functionality. Timing and availability are subject to change and applicable regulatory approvals.*
[10] JB52637XE, internal study compared *reading time with VS7 versus VS5* (led by Chérif Chalah & Cédric Hermel) 2017
[11] *Centricity 360 may be deployed in customer-based datacenter or private cloud*

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- **Centricity Clinical Archive Analytics (VNA):** Uses data from Centricity Clinical Archive to provide actionable insights to healthcare IT leaders and Radiology Directors with key metrics, such as archive utilization, image reading, EHR launch and TAT statistics. (in development)[12]
- **ECG Insights:** Uses information from the MUSE system to give administrators and clinical leaders visibility to factors contributing to Cardiology Department efficiency.
- **Alarms Spotlight:** Uses data from Carescape™ monitors to provide actionable insights that identify, target and track opportunities for alarms optimization.
- **Mammography Insights:** Provides a multi-vendor mammography practice summary of radiation dose, utilization and standardization metrics that enable Radiology Directors and clinicians to optimize clinical and operational performance of their mammography facilities and assets.
- **Imaging Utilization Manager:** Provides a full-fleet (multi-vendor, multi-modality) practice summary of imaging equipment radiation dose, utilization, and protocol compliance metrics that enables Radiology Directors, Imaging Supervisors and clinicians to optimize clinical and operational performance of their imaging assets.

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