NEWS BRIEF

GE Healthcare increases access to AI and deep learning digital tools on new intelligent CT scanners to achieve clinical and operational excellence

For more than four decades, GE Healthcare has developed CT scanners and solutions to meet the diverse needs of health systems, hospitals and clinics throughout the world. This year, GE Healthcare is proud to continue this tradition with the introduction of a new series of CT scanners and digital tools to help healthcare providers achieve clinical and operational excellence. This includes new applications and smart devices powered by Edison – a GE Healthcare's intelligence platform that helps developers and select strategic partners design, develop, manage, secure and distribute advanced applications and AI algorithms quickly.

At RSNA this year, GE Healthcare is proud to unveil **Revolution Maxima**, the latest addition to the GE Revolution family of intelligent CT scanners. Designed to help simplify the CT workflow, Revolution Maxima offers a variety of applications and services to improve efficiency, including its new, AI-based **Auto Positioning**[1] solution.

All patients are at risk of being mispositioned, which may lead up to a 38 percent increase[2] in dose and up to 22 percent increase in image noise[3]. Historically, these positioning challenges were difficult to solve due to inconsistent manual workflows, patient discomfort, and varying degrees of technologist experience.

Now, GE Healthcare's Edison-powered Auto Positioning technology takes the guess work out of patient positioning to help provide a modern-day solution. Auto Positioning uses real-time depth sensing technology to generate a 3D model of the patient's body. Then, using a deep learning algorithm, Auto Positioning pinpoints the center of the scan range and automatically aligns it with the isocenter of the bore. With one click, Auto Positioning uses the information to automatically center your patient for a completely hands-free positioning experience. In one case, a site scanning more than 60 patients per day and as many as 17 per hour saw an outstanding 93 percent utilization rate, allowing the staff to automate most of their scans and free up time for the technologists to focus more on patient care and comfort[4].

GE Healthcare is also showcasing **Revolution EVO Gen 3**[5], which increases customer access to the company's industry-first deep learning image reconstruction engine to generate **TrueFidelity CT Images**[6].

This Edison application represents the first commercially available deep learning-based CT image reconstruction technology. The next generation deep learning algorithm uses a dedicated deep neural network to generate TrueFidelity CT Images, which have the potential to improve reading confidence

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[1] 510(k) pending at FDA. Not available for sale in the United States.
[2] Kaasalainen, T., Palmu, K., Reijonen, V., & Kortesniemi, M. (2014). Effect of patient centering on patient dose and image noise in chest CT. American journal of roentgenology, 203(1), 123-130.
[3] Toth T, Ge Z, Daly MP. The influence of patient centering on CT dose and image noise. Med Phys 2007; 34:3093–3101.
[4] GE Healthcare Data on File
[5] 510(k) pending at FDA for GE Healthcare's Revolution EVO Gen 3 with TrueFidelity CT Images. Not available for sale in the United States.
[6] TrueFidelity CT Images are available on GE Healthcare's Revolution Apex CT system as well as an upgrade on the company's Revolution CT scanner.

in a wide range of clinical applications such as head, whole body and cardiovascular, for patients of all ages.

Compared to even the most advanced iterative reconstruction technology, TrueFidelity CT Images can elevate every image to a powerful first impression with impressive image quality performance[7], and preferred image sharpness and noise texture[8] – all without compromising the low dose levels to which clinicians have grown accustomed.

This state-of-the-art deep learning technology is made available on all generations of Revolution EVO through **Smart Subscription** – an Edison service – which provides access to all the latest CT device software, all the time, for one fee per device per year.

Smart Subscription enables operational excellence with easy, real-time access to the latest CT capabilities by connecting customers with GE Healthcare's digital ecosystem of applications and intelligent scanners. New applications and features are being designed and released to help providers improve work and information flow before, during and after CT exams. Additionally, Smart Subscription helps increase staff efficiency, reduces training and improves satisfaction by ensuring there is one set of capabilities to learn, operate and read.

GE Healthcare also announced that a new Edison application, **Intelligent Protocoling**, will be added to the Smart Subscription Workflow Package. Using a proprietary machine learning algorithm, Intelligent Protocoling leverages information from the patient's exam order history and a site's own CT practice to suggest the best protocol for each patient exam. Continuously learning through use, Intelligent Protocoling helps reduce time spent and eliminate the opportunities for errors in today's mostly manual protocol selection processes.

Furthermore, GE Healthcare will add several new additions to its comprehensive portfolio of CT applications. Powered by Edison, these applications help improve clinical efficiency and patient outcomes.

Hepatic VCAR[9]: CT liver segmentation is commonly used for volume assessment prior to major hepatic procedures. However, automated segmentation of the liver usually requires manual adjustments for pathological or unusual cases. GE Healthcare's Hepatic VCAR application utilizes deep learning to generate fast, reproducible results for segmenting the liver and the hepatic artery. This solution allows clinicians to achieve automated liver segmentation in under three seconds with a high segmentation success rate. Hepatic VCAR also provides a guided workflow for assessing the complete liver anatomy to assist in surgical planning and lesion evaluation.

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[7] Image quality comparisons between DLIR and ASiR-V, were evaluated by phantom tests of MTF, SSP, axial NPS, standard deviation of image noise, CT Number accuracy, CNR, and artefact analysis. Additionally, LCD was demonstrated in phantom testing using a model observer with the head and body MITA CT IQ Phantoms (CT191, CT189 The Phantom Laboratory). DLIR and ASiR-V reconstructions were performed using the same raw data.

[8] As demonstrated in a clinical evaluation consisting of 60 cases and 9 physicians, where each case was reconstructed with both DLIR and ASiR-V and evaluated by 3 of the physicians. In 100% of the reads, DLIR's image sharpness was rated the same as or better than ASiR-V's. In 91% of the reads, DLIR's noise texture was rated better than ASiR-V's. This rating was based on each individual reader's preference.

[9] 510(k) pending at FDA. Not available for sale in the United States. Not yet CE marked. Not available for sale in all regions.

FastStroke[10]: For the more than 15 million individuals[11] who suffer a stroke every year, time is of the essence in the diagnosis and management of acute ischemic stroke. Every minute in which a large vessel ischemic stroke is untreated, the average patient loses 1.9 million neurons, 13.8 billion synapses, and 12 km (7 miles) of axonal fibers[12]. With this in mind, the latest release of GE Healthcare's FastStroke helps expedite CT stroke workups by automatically loading and processing CT studies and communicating the processed images in an email format – providing a comprehensive workflow solution with exceptional flexibility and simplicity.

For more information on GE Healthcare's CT portfolio, visit gehealthcare.com.

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[10] 510(k) pending at FDA. Not available for sale in the United States. Not yet CE marked. Not available for sale in all regions.
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