SIEMENS Healthineers

Press

Malvern, Pa., Nov. 16, 2021

Siemens Healthineers SHAPE 22 Press Conference

Siemens Healthineers Launches World's First CT Scanner With Photon-Counting Technology

- **NAEOTOM Alpha excels in all technical parameters related to image quality**
- **Increase in resolution and reduction in radiation dose means jump in image quality impossible with conventional CT scanners**
- **Cleared for clinical use in U.S. and Europe, more than 20 systems installed, over 8,000 patients scanned, over 500 patents filed related to photon-counting**

Siemens Healthineers launches the NAEOTOM Alpha, the world's first photon-counting CT scanner. As of today, the system is cleared for clinical use in the U.S. and Europe. Conventional CT imaging has reached its technical limitations: Resolution can only be improved by small margins and dose cannot be reduced significantly: Photon-counting technology enables drastic improvements. These improvements include an increase in resolution and a reduction in radiation dose by up to 45 percent for ultra-high resolution (UHR) scans compared with conventional CT detectors with a UHR comb filer. This would be impossible with conventional detectors. Photon-counting scans contain more useable data, due to the fact that photon-counting technology directly detects each X-ray photon and its energy level instead of first converting it into visible light as with conventional CT imaging.

These aspects combined open up new capabilities, such as scanning a patient's lung at a high scan speed and obtaining high-resolution images with inherent spectral information—without the patient having to hold their breath. This spectral information also helps to identify materials inside the body that can even be removed from the image should they obstruct an area of interest. This helps physicians to assess issues quickly and offers the possibility to begin treatment early. Through the reduction in radiation dose, regular examinations such as lung cancer screenings using CT imaging can become routinely available for larger patient populations. And the high resolution reveals even small

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structures, taking clinical decision-making to a new level of confidence. The technical complexity of photon-counting CT imaging does not mean increased complexity for the user, thanks to myExam Companion from Siemens Healthineers.

“More than 15 years ago, work on photon-counting CT and this clinical vision started at Siemens Healthineers. We always believed in the tremendous clinical value and relentlessly worked on it together with our partners,” said Philipp Fischer, Head of Computed Tomography at Siemens Healthineers. “Today, with the introduction of the NAEOTOM Alpha, we are taking a huge step in furthering patient care in a wide range of clinical domains by effectively showing things impossible to see with conventional CT scans. This required a radical rethinking of practically every technological aspect of computed tomography.”

Profound impact in many clinical fields

The clinical fields of cardiac imaging, oncology, and pulmonology all have their own unique demands of medical images. In cardiac imaging, it is capturing the heart while moving, which therefore requires speed. The NAEOTOM Alpha delivers speed thanks to its Dual Source design and benefits from spectral information and high resolution for removing obstructions caused by calcifications. This enables diagnostic assessment and allows more patients to benefit from CT imaging—even those with a high calcium burden.

The high precision offered by the NAEOTOM Alpha is also highly beneficial in oncology, where reliable and consistent evaluation of disease progress is the most important factor. Therefore, clinical images need to be as conclusive and consistent as possible to make the right decisions. In pulmonology, images need to contain all meaningful answers in as few scans as possible to avoid treatment delays and potentially severe consequences for patients. These needs are met and often exceeded by the NAEOTOM Alpha’s features. Its clinical images inherently carry more information than ever possible before for precise diagnosis, follow-up, and treatment.

Expanding CT’s role in clinical decision-making

The implications of this innovation from Siemens Healthineers are far-reaching for patients and physicians, and may profoundly change the way that CT imaging is performed: It adds clinical value for fast, reliable diagnoses by the physician by improving image quality,

potentially leading to less uncertainty for physicians and patients. The new technology helps in almost every clinical field, but especially when fine structures have to be evaluated. Customer feedback from testing with actual final systems confirms that ambition. “We have been working with our own NAEOTOM Alpha CT since April 2021 and are very impressed by initial results,” said Professor Thomas Kröncke, MD, Head of the Department of Diagnostic and Interventional Radiology, University Hospital Augsburg, Germany[1]. “In oncology, we can break down more precisely which tumor types we are dealing with and thus treat them in a more targeted and effective way. It is like a veil that is now lifting. The new technology is a radical improvement on previous imaging. This will redefine our clinical decision-making right from scan one.”

In over 15 years of research into photon-counting CT imaging, Siemens Healthineers has filed over 500 patents related to this technology and collaborated closely with clinical partners to test and validate the clinical capabilities and use cases. Six prototypes have been evaluated and improved on over the years. In 2021, the company presents the world’s first CT scanner with the new technology, released for clinical use. More than 20 systems have already been installed and are used in clinical routine. So far, over 8,000 patients have been scanned. With a rotation speed of 250 milliseconds and two X-ray tubes and detectors (Dual Source), the NAEOTOM Alpha is not only the first photon-counting CT system on the market but is also a very powerful, fast, and precise CT scanner.

[1] The statements by customers of Siemens Healthineers described herein are based on results that were achieved in the customer's unique setting. Because there is no “typical” hospital or laboratory and many variables exist (e.g., hospital size, samples mix, case mix, level of IT and/or automation adoption), there can be no guarantee that other customers will achieve the same results.

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For more information on the NAEOTOM Alpha, please see siemens-healthineers.us/naeotom-alpha

Siemens Healthineers AG (listed in Frankfurt, Germany: SHL) is shaping the future of healthcare. As a leading medical technology company headquartered in Erlangen, Germany, Siemens Healthineers enables healthcare providers worldwide through its regional companies to increase value by empowering them on their journey towards expanding precision medicine, transforming care delivery, improving the patient experience, and digitalizing healthcare. Siemens Healthineers is continuously developing its product and service portfolio, with AI-supported applications and digital offerings that play an increasingly important role in the next generation of medical technology. These new applications will enhance the company's foundation in in-vitro diagnostics, image-guided therapy, and in-vivo diagnostics. Siemens Healthineers also provides a range of services and solutions to enhance healthcare providers' ability to provide high-quality, efficient care to patients. In fiscal 2021, which ended on September 30, 2021, Siemens Healthineers, which has approximately 66,000 employees worldwide, generated revenue of €18.0 billion and adjusted EBIT of €3.1 billion. Further information is available at www.siemens-healthineers.com.