

Healthcare Sector

For the trade press

Erlangen, 17 July 2008

New study proves: heart scan with lower dosage possible using dual-source computed tomograph

A new study reveals that, with dual-source computed tomography (DSCT), the effective dosage for a heart examination can be significantly lowered, in comparison to conventional computed tomography (CT). The study also demonstrated that stenoses can be diagnosed with the same high accuracy as with invasive x-ray angiography. At the University Hospital in Zürich in Switzerland, 120 patients with suspected coronary heart disease were scanned with the world's first CT scanner with two X-ray tubes; a Somatom Definition from Siemens Healthcare. The Siemens application, Adaptive Cardio Sequence with the step-and-shoot mode, was also used for the first time with a dual-source CT. The results of the study were published in the June issue of "Heart", the official journal of the British Cardiovascular Society.*

Angiography is a diagnostic procedure used to clarify coronary arterial occlusion. Normally, this examination is conducted using angiography devices in the catheter laboratory and computed tomographs (CT), but with CT, the question of the radiation dosage plays a huge role. Researchers at the University Hospital in Zürich now want to see whether the dose used during CT angiography can be reduced. The research team examined 120 patients with suspected coronary heart disease in a Somatom Definition from Siemens, the world's first computed tomograph with two x-ray tubes.

* H. Scheffel, MD, H. Alkadhi, MD, S. Leschka, MD, A. Plass, L. Desbiolles, I. Gruber et al: Low-Dose CT Coronary Angiography in the Step-and-Shoot Mode: Diagnostic Performance, in Heart online, 2 Jun 2008

The researchers used the new application "Adaptive Cardio Sequence", which was recently developed by Siemens for all Somatom Definition Scanners. The application is based on the step-and-shoot method, in which the next respective diastole is calculated and only this phase of the cardiac cycle is used to obtain image data. The combination of Adaptive Cardio Sequence and the DSCT's maximum time resolution of 83 msec facilitates this technique in a particularly reliable fashion and permits a further significant reduction in dosage.

"The results show that CT coronary angiography with a dual-source CT in step-and-shoot mode produces images of excellent diagnostic quality in patients with stable heart rates up to 70 bpm. The dosage reduction achieved in comparison to previous CT angiography is also remarkable. In our study, we required an effective dose of 2.5 mSv on average with a deviation of plus/minus 0.8 mSv. In the literature, a normal average effective dose for heart scans of between 9 and 21 mSv is reported," said Dr. Hatem Alkadhi, specialist in Radiology at the Institute for Diagnostic Radiology, University Hospital Zürich, Switzerland.

The Adaptive Cardio Sequence supplements the step-and-shoot method with intelligent algorithms, which monitor the heart frequency of patients and, if necessary, respond to arrhythmia, such as extrasystoles, additional heart beats. In this case, the recording phase is automatically postponed in order to avoid image errors due to the sudden movement. In addition, the recording window can be widened a little more if required so that, with the Adaptive Cardio Sequence, the robustness of the CT scan can be increased significantly overall.

"For Siemens, the safety of the patients has always been the primary focus of the developments in CT. At the same time, we consider our highest obligation to be to give doctors the best diagnostic image quality and to support them in making their workflow as efficient as possible. With this outlook and constant further development, Siemens has positioned itself as the market leader in CT technology," said Dr. Sami Atiya, CEO, Computed Tomography, Siemens Healthcare. "Innovations for dose reduction in conjunction with improved diagnostic image quality, are therefore of the utmost importance to us. This is

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why we have also further developed our Adaptive Cardio Sequence, now for the dual-source CT. The study from Zürich confirms to us that the combination of step-and-shoot and dual-source computed tomography does significantly reduce the dosage required during heart scans."

The **Siemens Healthcare Sector** is one of the largest suppliers of healthcare technology in the world. The company sees itself as a medical solution provider with key competences and innovative strength in the diagnostic and therapeutic technologies as well as in knowledge processing including IT and system integration. With its acquisitions in laboratory diagnostics, Siemens Healthcare is the first integrated healthcare company, which combines imaging and laboratory diagnostics, therapy solutions and medical IT with each other and then supplements this offer with consultancy and service performances. Siemens Healthcare offers solutions for the entire supply chain under one roof - from prevention and early detection through diagnosis and on to treatment and aftercare. In addition, Siemens Healthcare is the world market leader for innovative hearing devices. The company employs some 49,000 employees worldwide and is present in more than 130 countries. In fiscal 2007 (up to 30 September), Siemens Healthcare achieved sales of €9.85 billion and incoming orders of €10.27 billion. The Group earnings amounted to €1.32 billion.

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