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## New Angiography Products from Siemens



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Siemens Healthcare has developed a revolutionary new X-ray tube and detector technology for its Artis Q and Artis Q.zen angiography systems to improve minimally invasive therapy of diseases such as coronary artery disease, stroke and cancer.

In both systems, the new X-ray tube can help to identify small vessels up to 70 percent better than conventional X-ray tube technology. The Artis Q.zen combines this innovative X-ray source with a new detector technology that supports interventional imaging in ultra-low dose ranges.

The second generation of Siemens' flat emitter technology is key to the advances made in the X-ray tube for the Artis Q and Artis Q.zen product lines. Instead of the coiled filaments used in conventional X-ray tubes, flat emitter technology is used exclusively in the new tube to emit electrons. Flat emitters enable smaller quadratic focal spots that lead to improved visibility of small vessels by up to 70 percent. Both physicians and patients benefit from a high level of detail in imaging-supported interventional therapy. Neurologists can more precisely measure the blood circulation in specific areas of the brain, for example; while stenoses in the heart's smallest blood vessels can be spotted in coronary angiography.

Artis Q.zen imaging can use doses as low as half the usual levels normally applied in angiography. This improvement is the result of several innovations, including a fundamental change in detector technology. Until now, almost all detectors have been based on amorphous silicon. The new crystalline silicon structure of the Artis Q.zen detector is more homogenous, allowing for more effective amplification of the signal, greatly reducing the electronic noise even at ultra-low doses.

The Artis Q.zen was developed to support better imaging quality at ultra-low-dose ranges, reducing the radiation exposure of patients, physicians, and medical staff. This is especially important in dose-sensitive application fields such as paediatric cardiology and radiology, or electrophysiology, which is being used on more and more patients as rates of cardiac arrhythmia increase in an aging population.

In addition to the hardware innovations are several software applications that improve interventional imaging. In coronary artery disease treatment, the applications allow precise correlation of angiography images with ultrasound images taken by a probe inside the coronary arteries. Stents are imaged in real-time during therapy, with motion stabilization created by simultaneous correction for the heartbeat.

Other new 3D applications can image the smallest structures inside the head. Their high spatial resolution is crucial for imaging intracranial stents or other miniscule structures, such as the cochlea in the inner ear. Moving organs such as the lungs can be imaged in 3D in less than 3 seconds, reducing the number of motion artifacts and the amount of contrast agent required. Through visualisation and measurement of blood volumes in the liver or other organs, Siemens' functional 3D imaging provides a basis for planning therapies such as chemo-embolisation of hepatic tumors.

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