Medical Solutions

For the daily and trade press
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Background Information: Computed Tomography

With the development of Computed Tomography (CT) in 1972, Godfrey N. Hounsfield ushered in the greatest invention in the field of radiology since the discovery of X-rays in 1895. A CT system enables detailed views inside the body. Siemens was already at that time leading the development and production of CT systems. In 1974 the company brought the first computed tomography system, the Siretom, to market.

Function

A CT system works with X-rays to create a two-dimensional cross-sectional image. This can be explained by the operating principle of the system: the X-ray source and detector, which converts the X-rays to light signals, rotate about the patient. Using specialized software, the numerous two-dimensional slices acquired are converted into the final three-dimensional image.

History

Since the 1970s, the technology has been continually developed and improved. After the development of the Somatom 1, the first whole-body CT system, an additional milestone was set in the mid-80s by the first three-dimensional display of anatomical details – for example, of bones.

In 1989 – just four years later – Siemens marketed the first spiral scanner. In contrast to the previous procedure, the patient moved slowly through the measurement field. At the

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same time, the X-ray source with detector – the gantry – rotated continuously about the body, acquiring images slice-by-slice in a spiral shape.

The short measurement time of only 24 seconds for 24 centimeters enabled to acquire the lung in a single breathhold for the first time. Today, the Somatom Sensation 64 requires only four seconds for a complete acquisition of the lung.

The advances in research and development continued uninterruptedly into the 90s. In 1992, CT established its place in angiography. Fast rotation and processing speeds enabled the acquisition of vessels filled with contrast agent.
Just six years later, with the Somatom Volume Zoom, it became possible to acquire multiple slices in a single gantry rotation. This enabled the non-invasive early detection of plaque and occlusions in the coronary vessels. The Somatom Sensation 64 computed tomography system is the latest development from Siemens. Its spatial resolution is less than 0.4 millimeters, and its speed for a full rotation of the X-ray source and detector is 0.33 seconds. It is now possible to perform high-resolution acquisitions of the beating heart and all blood vessels. This provides critical support for medical diagnoses.

Research and Development

After 30 years of research, Siemens can look back on enormous successes thanks to its continued further development of CT systems. In addition to system development, Siemens has not been idle in the area of research; it develops and produces the most important CT components – X-ray tubes and detectors. As a result, Siemens has been able to establish the unique Ultra Fast Ceramic (UFC) as its detector material. This reduces the radiation dose without negatively impacting image quality.
Siemens is also a leader in the further development of clinical applications. A virtual flight through the human intestinal tract or coronary vessels is no longer just a dream.

Siemens Medical Solutions is one of the world's largest suppliers to the healthcare industry. The company is known for bringing together innovative medical technologies, healthcare information systems, management consulting, and support services, to help customers achieve tangible, sustainable, clinical and financial outcomes. From imaging systems for diagnosis, to therapy equipment for treatment, to molecular medicine to hearing instruments and beyond, Siemens innovations contribute to the health and well-being of people across the globe, while improving operational efficiencies and optimizing workflow in

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hospitals, clinics, home health agencies, and doctors' offices. Recent acquisitions in the area of in-vitro diagnostics – such as Diagnostic Products Corporation – mark a significant milestone for Siemens as it becomes the first full service diagnostics company. Employing approximately 36,000 people worldwide and operating in more than 130 countries, Siemens Medical Solutions reported sales of 8.23 billion EUR, orders of 9.33 billion EUR and group profit of 1,06 billion EUR for fiscal 2006 (preliminary figures). Further information can be found under: http://www.siemens.com/medical

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