

# Computed Tomography Is Multi-Slice

With this year's RSNA, Siemens Medical Solutions offers multi-slice computed tomography systems for all markets, medical purposes and budgets.

No other area of medical imaging has witnessed an explosion of performance comparable to the one which has occurred in computed tomography (CT). Just several years ago almost all CT systems had only a single detector row. Scan times of 30 seconds were state of the art for a head CT scan. Cardiac CT was possible, however, limited to the display of calcifications in the coronary vessels. Furthermore, due to breath-hold times of approximately 40 seconds, cardiac CT also demanded a high willingness to cooperate, even from healthy patients. The detail resolution was in the 0.7-millimeter range, and more than one millimeter in the axial direction.

The explosion in performance capability noted above was sparked at the 1998 convention of the Radiological Society of North America (RSNA) in Chicago, where all major CT manufacturers presented systems with four detector slices. Scan times suddenly decreased to just a fraction of what they had been; improved volume coverage and reduced gantry rotation time enabled new types of applications such as CT examinations of the heart and coronary vessels. As multi-slice CT is coming of age, Siemens Medical Solutions now offers multi-slice systems for all markets, medical purposes and budgets – from the new economical two-

slice scanner SOMATOM® Spirit to the latest flagship model SOMATOM Sensation 64.

## Clinical Advantages

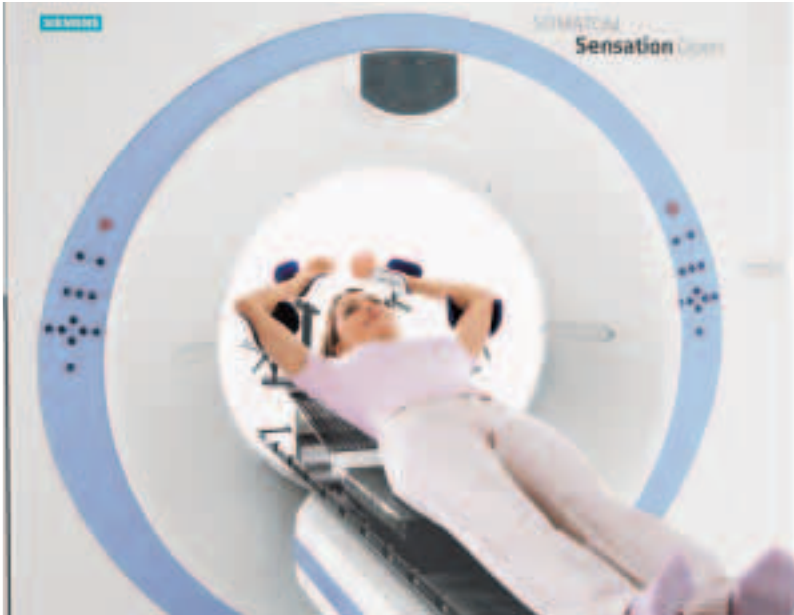
Compared to single-slice systems, multi-slice CT scanners represent a technological milestone with respect to increased volume coverage, shorter examination times, improved axial image resolution and better utilization of the X-ray tube output. Examination protocols can thus be optimized for maximal volume coverage, shortest scan times, highest spatial resolution or fastest temporal resolution. At the same time, Siemens' development team has improved dose efficiency and minimized radiation exposure. And it was not just the technology that leaped forward: CT has grown from a purely diagnostic method for already symptomatic diseases to a patient-friendly and reliable tool for the early visualization of, for example, lung and colorectal cancer, or coronary heart disease.

## Completing the High-End Portfolio

This development culminates in the SOMATOM Sensation 64 and SOMATOM Sensation Cardiac 64 that firmly established a new benchmark for diagnostic excellence.



THE SOMATOM SENSATION 64 completes the high-end CT portfolio.



THE LARGE bore of the SOMATOM Sensation Open eases patient positioning.



THE SOMATOM EMOTION'S wide gantry enables easy patient access.



THE SOMATOM SPIRIT comes with a comprehensive set of applications.

Siemens proprietary z-Sharp Technology™ enables the industry's best isotropic resolution of smaller than 0.4 mm in clinical routine. The STRATON® X-ray tube utilizes an electron beam that is accurately and rapidly deflected, creating two alternating and overlapping X-ray projections reaching each detector element. This doubles the scan information without a corresponding increase in dose, resulting in substantially enhanced spatial resolution and image quality. Additionally, the unique STRATON X-ray tube's direct cooling eliminates the need for heat

storage capacity and enables the industry's fastest CT rotation time of 0.33 seconds. SOMATOM Sensation 64's unmatched clinical performance finally eliminates the necessity to compromise between image resolution and scan speed. With the introduction of the new SOMATOM Sensation 40, Siemens continues the tradition of the SOMATOM Sensation product line to continually integrate cutting-edge imaging applications into daily clinical practice. It benefits from the revolutionary z-Sharp Technology and the unique STRATON X-ray tube,

enabling an acquisition of 40 slices with unprecedented image quality and 0.4-mm isotropic detail. Together with its gantry rotation speed of 0.37 seconds, the SOMATOM Sensation 40 opens the world of high-end computed tomography to hospitals, imaging centers and private practices. As on all SOMATOM Sensation scanners, Siemens' Speed4D Technology™ also supports workflow and dose management on the SOMATOM Sensation 40.

Both SOMATOM Sensation 40 and SOMATOM Sensation 64 – which even further expands the scope of applications – provide breath-taking image sharpness and clarity. With its faster rotation and increased scan speed the SOMATOM Sensation 64 and SOMATOM Sensation Cardiac 64 push the boundaries of temporal resolution to a new level, enabling cardiac examinations with previously unachievable image quality. The SOMATOM Sensation upgrade philosophy allows every SOMATOM Sensation scanner to easily develop with the clinical necessities of users. In fact, the SOMATOM Sensation 40 can easily be upgraded to a 64-slice system if need arises.

The SOMATOM Sensation 16, with the industry's largest installed base of 16-slice CT scanners, represents a time-tested reliable CT system that combines high-end performance and investment protection. "The fact that the SOMATOM Sensation 16 itself was introduced just three years ago illustrates the momentum innovations have gained since CT became multi-slice," explains Bernd Ohnesorge, Ph.D., Vice President Marketing and Sales of Siemens Computed Tomography division. "And the fact that it was again Siemens who first announced the first 64-slice system at last year's RSNA underlines our mission as innovation leaders."

## High Performance for All Patients

With the SOMATOM Sensation Open, Siemens introduces a large-bore CT system that delivers a new level of diagnostic support for radiation therapy planning, as well as CT-based trauma examinations, interventional proce-

dures and imaging of bariatric patients with excellent performance in routine and advanced CT examinations. The 20-slice system delivers an image resolution of 1.2 millimeters. Gantry rotation speeds of one and 0.5 seconds are available. The SOMATOM Sensation Open's generous 82-centimeter gantry bore allows increased accessibility and easy positioning of virtually all patients. Its 82-centimeter field of view provides visualization of the entire anatomy, improving both therapy planning and diagnostic examinations.

The first installations were successfully completed in early summer 2004. Customers are very pleased with its performance and its enhanced specifications. "The SOMATOM Sensation Open gives us the flexibility of a large-bore CT while having a solution for virtually all advanced CT examinations at the same time," says Professor Jürgen Debus, M.D., Medical Director of Radiology Department, University of Heidelberg, Germany, where one of the first systems was installed.

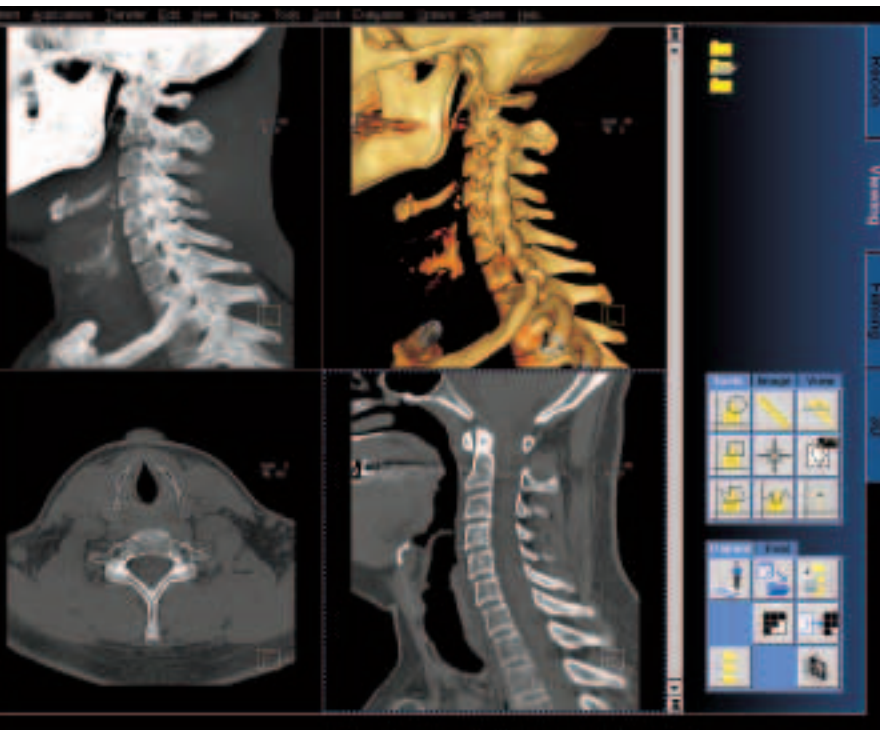
## The Best of Both Worlds

Smaller hospitals and practices with a lot of routine CT examinations are equally well equipped with the scanners of the SOMATOM Emotion series. With 3 000 systems installed, they are among the most popular CT systems in the world. And not without reason: SOMATOM Emotion scanners combine the best of both worlds: a comprehensive portfolio of clinical applications with low siting requirements and low running costs.

The SOMATOM Emotion was first introduced in 1999 as a single-slice spiral CT scanner. Since then, Siemens has continually improved its performance. A dual-slice version was added in 2000 providing faster scanning capabilities, better anatomical coverage, and the possibility to scan routinely with thin slices. In 2003, Siemens added the SOMATOM Emotion 6.

This scanner is living proof that advanced clinical applications – for example *syngo* VRT and *syngo* Colonography – and a cost-conscious budget do not have to be mutually exclusive. Rapid 3D-based visualization of

CARE  
COMPUTED TOMOGRAPHY



THE SOMATOM EMOTION 6 is the right CT system designed for routine and advanced clinical applications. Courtesy of H.-Hart Ziekenhuis, Lier, Belgium.



USERS OF the SOMATOM Spirit need not compromise when it comes to achieving clinical performance.

pulmonary nodules with *syngo LungCARE CT*, semiautomated vessel quantification with *syngo Vessel View*, and advanced diagnostic perspectives like *syngo Fly Through* are just some of the features that can be added to the customer's clinical routine. Patients appreciate the slim system with its 70-centimeter gantry opening, and also the numerous dose reduction features – for example *CARE Dose4D™* – available for the SOMATOM Emotion scanners.

Reliably performing routine and advanced applications today, they also leave the future open for further system enhancements and upgrades, growing with the customer's clinical needs and budget. With the great success of the SOMATOM Emotion and its evolution throughout its five-year history, Siemens remains committed to this important member of its SOMATOM product family. Development of the SOMATOM Emotion, even beyond six slices, persists, ensuring that it will continue to evolve and meet the future clinical requirements of multi-slice CT.

## Join the World of Multi-Slice CT

The newest member of Siemens' Computed Tomography family is the trendsetting, sub-second, dual-slice SOMATOM Spirit, a cost-effective system for day-to-day clinical routine. "Multi-slice CT is strongly implemented into clinical routine today. We feel that every patient – and physician – should profit from the advantages a multi-slice CT system offers," says Ohnesorge.

With its extremely attractive price, the SOMATOM Spirit is the multi-slice CT for both small and large facilities. It is not only the ideal system to replace outdated scanners or to add an additional CT to an overworked facility, it is also the multi-slice scanner of choice for an affordable, easy entry into the fascinating world of CT. With its specifications, the SOMATOM Spirit is the perfect multi-slice CT for day-to-day examinations. It is also ideally suited for small, outlying clinics utilizing teleradiology, as well as medical fields other than radiology, such as ENT and urology practices, dental surgeons and

general practitioners. By adding CT to their medical services, virtually any practice or facility can improve the quality of patient care and increase patient volume.

The SOMATOM Spirit acquires two slices per rotation, but has the price tag of a single-slice scanner, thus making multi-slice CT universally affordable. With the introduction of the SOMATOM Spirit, a new era of affordable, efficient multi-slice CT begins.

It is not just the purchase price that makes the SOMATOM Spirit economical: low installation and space requirements – only 17 square meters (183 square feet) – fast installation time, efficient preventive maintenance, its fast breakeven, high reliability and uptime ensure a good return on investment. The breakeven point can be reached in a short period of time with only a few patients per day. However, depending on the type of examinations, up to fifty patients can be examined in an eight-hour workday\*, making it one of the most cost-effective, multi-slice CTs on the market today.

With the SOMATOM Spirit's spatial resolution of one millimeter and its gantry rotation time of one second, physicians do not have to compromise when it comes to clinical performance. For even better results, 0.8 seconds gantry rotation time is available as an option. X-ray efficiency is assured by the optimized system geometry of the SOMATOM Spirit, the highly efficient UFC (UltraFastCeramic) detector material, and Siemens' dose reduction software CARE Dose and CARE Bolus. All these features lead to excellent image quality and, at the same time, significantly reduce dose.

Additionally, the SOMATOM Spirit offers a comprehensive spectrum of routine CT applications. The standard application portfolio includes real-time multi-planar reformatting (MPR), *syngo* 3D SSD (Shaded Surface Display), volume measurements, and CT-angiography. The optional *syngo* VRT (Volume Rendering Technique) software facilitates 3D display. To support examination and diagnosis of lumen, *syngo* Fly Through is available as an option. Further specialized, optional applications like *syngo* Dental CT

and *syngo* Osteo CT are also on hand. These features make the SOMATOM Spirit a good investment also for dental surgeons, orthopedic physicians and general practitioners.

The CT-specific elements of *syngo*, Siemens' intuitive multimodality user interface, were simplified especially for the SOMATOM Spirit to further increase user comfort. *syngo* can be learned and applied without extensive training. The user is "guided" through examinations, and the workflow is automated wherever possible. The intuitive handling and the automation give the user confidence from the very beginning.

With a gantry aperture of 70 centimeters (27.6 inches), and a patient table load of 200 kg (450 lbs), the patient spectrum of the SOMATOM Spirit is virtually unlimited. The flared, wide gantry opening and the short bore allow for easy patient positioning and access, making the SOMATOM Spirit a comfortable CT for both patient and medical staff. The appealing, esthetic design also helps to alleviate patient inhibitions.

The SOMATOM Spirit is Siemens' latest CT and incorporates over 30 years of CT know-how and expertise of the world's leader in multi-slice CT. It combines new innovations with successful and proven functions, technologies, and components of other SOMATOM products.

"Who would have thought, just a year ago, that a subsecond, multi-slice CT would be affordable as an entry-level system?" comments Ohnesorge. "With the SOMATOM Spirit, we offer our customers just that – to enhance their clinical portfolio for providing better patient care." The SOMATOM Spirit will be available worldwide in Spring 2005.

With its extensive portfolio of forward-looking, patient-friendly CT scanners, the Siemens SOMATOM family offers the right multi-slice CT system for any size hospital or practice, any diagnostic need and any reasonable budget.

\*Results may vary. Data on file.