Contents

COVER STORY
Speed4D Technology – Shifting Paradigms in CT
Page 4

NEWS
82 cm Bore increases Spectrum of Advanced CT
Page 11

CLINICAL OUTCOMES
Straton: First Case Studies with the new X-Ray Tube
Pages 15 and 18

SCIENCE
syngo LungCARE with extended Functionality
Page 28

CUSTOMER CARE
Life – Building Successful Partnerships
Page 31
Dear Reader,

The success of our customer magazine SOMATOM® Sessions has been overwhelming. I would like to take this opportunity to thank you for your positive feedback and the many scientific essays and case studies you submitted over the past years. Your comments are confirmation and motivation for us at the same time. Without you as our customers, readers, and authors it would not have been possible to produce such an outstanding magazine.

Your constant positive response has now encouraged us to develop the SOMATOM Sessions from a purely scientific oriented collection of clinical case studies into a news magazine from the world of computed tomography, offering a wide range of worthwhile information on clinical, scientific, and management topics.

Thus our Business section will include examples of how hospitals and practices employ our SOMATOM CT scanners for better patient care and increased business benefits at the same time. Technicians will find information on “how to...” in our Customer Care section. This section also includes details on our integrated customer care program Life that is relevant for physicians, administrators, and techs alike. Of course we do not forget our long-established readers: The main part of the future SOMATOM Sessions will be clinical studies in the Clinical Outcomes section, and the Science section with articles on research projects and trends in CT.

We hope the new SOMATOM Sessions meet the high expectations we are used to from our readers and customers.

As in the past, our editorial team appreciates your suggestions, comments, and contributions. I wish you an interesting reading.

Your sincerely,

Richard Hausmann, PhD

Richard Hausmann, PhD, President CT Division
COVER STORY
4 Speed4D™ Technology – Shifting Paradigms in CT

NEWS
11 82 cm Bore increases Spectrum of Advanced CT
11 First Flat-Panel CT Prototype at the MGH
12 Benefits for Patients, Physicians, and the Bottom Line
12 New Software available for installed SOMATOM CT Systems

BUSINESS
13 Proven Outcomes: Break even with one Examination a Day
13 New Applications on syngo Web-based Training
14 The Comprehensive Software Solution

CLINICAL OUTCOMES
15 SOMATOM Sensation 16 with Straton™: Atypical Dissection of Internal Carotid Artery
18 SOMATOM Sensation 16 with Straton: Left Main Coronary Stent Patency with 16-row MSCT Coronary Angiography
21 SOMATOM Sensation 16: Evaluation of Abdominal Arteries
22 syngo® Colonography
22 SOMATOM Volume Zoom: Positive CT Colonography after negative Colonoscopy
24 SOMATOM Emotion 6: CT Colonography after incomplete Colonoscopy

SCIENCE
27 CT Colonography – Current and Emerging Applications
28 Research: syngo LungCARE with extended Functionality Now FDA Cleared

CUSTOMER CARE
31 Life – Building Successful Partnerships
32 SOMATOM Life @ Your Scanner – Information and Clinical Options @ Your Fingertips
33 Service: Frequently Asked Questions
34 Service: CT Online
34 Service: Upcoming Events

35 Imprint
With the introduction of 16-slice CT and rotation speed of less than 0.5 seconds at the RSNA 2001, advanced sub-millimeter imaging of large scan volumes and the heart has entered clinical routine. In the meantime, the leading technical design and clinical performance of the Siemens SOMATOM Sensation 16-slice CT scanners has been proven in more than 700 installations worldwide. In order to provide further significant performance enhancements for advanced imaging and workflow requirements, the Computed Tomography Division of Siemens Medical has developed Speed4D Technology that will be introduced at the RSNA 2003. Speed4D Technology sets new benchmarks in imaging speed and represents a paradigm shift in CT tube technology, dose automation and workflow management. As such it enables advanced utilization of cutting-edge Multi-slice CT technology and the efficient integration of sophisticated imaging applications in daily clinical practice.

Straton – a Paradigm Shift in X-Ray Tube Technology

Straton is the name of a novel, directly cooled X-ray tube proprietary to Siemens. It empowers gantry rotation time below 0.4 seconds and allows virtually unlimited volume coverage at maximum scan speed without compromises on resolution and image quality. Direct anode-cooling enables extremely high cooling rates and eliminates the need for anode heat storage capacity. Cooling delays in a series of long range scans are virtually eliminated even in large patients. The very compact design is robust even at extremely high G-forces. The anode and inner tube assembly is much smaller than in conventional X-ray tubes. The Straton is the first and only X-ray tube that routinely enables gantry speed of 0.37 seconds per rotation and supports sub-millimeter scanning with 500 mA for 20 seconds scan time – for up to 14 scans in one hour. A whole body trauma examination with submillimeter resolution and full tube current (500 mA) can be completed in less than 20 seconds. A high resolution coronary CTA examination takes less than 15 seconds. Thus, Straton provides substantial improvements for cardiac imaging and fast high-resolution volume scanning where acquisition speed is crucial.

A New Workflow Design for True 3- and 4-Dimensional Imaging

Siemens Med’s software engineers have discovered new ways of workflow automation in order to optimize the efficiency and flexibility in true volumetric CT imaging on a new powerful 3GHz dual processor architecture. The new true 4D workflow design WorkStream4D™ virtually eliminates the need for time-consuming manual reconstruction steps: Within standardized imaging protocols, the user simply plans the image planes that are needed for diagnosis, the software will do the rest – with a full matrix image-reconstruction speed up to ten images per second in real-time mode and up to five images per second with full cone reconstruction. Instant oblique and double-oblique reconstruc-
The compact design of the new Straton X-ray tube allows for gantry rotation time of 0.37 seconds.
In conventional X-ray tubes, the entire anode including the bearings is encapsulated in a vacuum and cannot be efficiently reached by the cooling fluid. The cooling rate of these tubes is therefore rather low. Engineers have consequently been trying to increase the heat storage capacity of X-ray tubes, leading to tubes with capacities up to 8 million Heat Units (MHU). These tubes allow scanning until the heat storage capacity is filled. Once overheated, even such state-of-the-art conventional X-ray tubes take five to ten minutes to cool down to normal operation temperatures.

The new Straton tube provides direct cooling of the anode with all bearings located outside the vacuum. Similar to a miniature Electron Beam CT, the electron beam in the tube is shaped and controlled by an electromagnetic field. The direct anode cooling enables unprecedented cooling rates of 4.7 MHU/min and eliminates the need for large heat storage capacities. In fact, the heat storage capacity of the new anode is close to 0 MHU. Even at maximum load, Straton cools down within only 20 seconds – much less time than needed to initiate the next scan or to position the next patient. With substantially higher tube life-time even at much higher G-forces this new revolutionary design is the key to increased gantry rotation speed and reduced life-cycle cost at the same time.
The new true 4D workflow design WorkStream4D virtually eliminates the need for time-consuming manual reconstruction steps, the software will do that automatically.

In addition, the data volume can be reduced significantly—without compromising on diagnostic quality. Seamless operation is possible because the procedure runs in the background.

The new true 4D workflow design WorkStream4D enables faster examination even for complex anatomy. For cardiac examination double oblique image data can be processed in up to 24 phases of the cardiac cycle, enabling true dynamic 4-dimensional evaluation. WorkStream4D thereby pushes the evolution of CT in a true volumetric imaging system.

WorkStream4D can also significantly reduce the amount of data produced in each case. The diagnostic information in up to 2000 thin slices that are acquired from a high-resolution scan can be captured in pre-defined series of image planes via direct 3-dimensional reconstruction of the raw scan data. This translates into a significant reduction of data volume by up to a factor of ten while still enabling a comprehensive physicians’ diagnosis with best image quality. The automated image reconstruction and processing procedures are performed in the background even parallel to scanning, and can
be initiated from the Navigator scan console as well as from
the Wizard evaluation console that is connected via a shared
database.

The Fourth Dimension for Cardiac CT
The new syngo InSpace4D™ for real-time interactive volume
diagnosis now offers true 4-dimensional evaluation of the
heart based on high-resolution image reconstruction in
up to twelve phases of the cardiac cycle simultaneously.
Combined with the VolumePro graphics accelerator card,
the new software enables real-time visualization and
examination of the beating heart, evaluation of functional
defects and navigation in any arbitrary plane (see also
www.InsideInSpace.com).

Dose Management with CARE Dose4D
– Because Every Patient is Unique
All CT innovations are created with the patient in mind.
Therefore Siemens engineers have again enhanced CARE
(Combined Applications to Reduce Exposure) – the Siemens
initiative for the reduction of radiation exposure in X-ray
based examinations. The new CARE Dose4D™ provides a ful-
ly automated real-time dose regulation and truly anatomy-
based exposure control for the adaption of total radiation
dose and optimization of image quality. It adapts the emitted
dose automatically to the specific anatomical characteristics
of each individual patient, without the need for any user
interaction and thus enables substantially reduced dose in
volume scans of adults and children. Instead of just taking
into account the patient’s external dimensions and apparent
size, CARE Dose4D analyzes the cross-sectional anatomy in
real-time and adjusts the emitted X-ray dose accordingly.
There is no need for an additional topogram to determine
the patient attenuation. This leads to best and consistent
image quality with the lowest possible X-ray dose during
large volume examinations. Initial clinical experience using
CARE Dose4D demonstrates dose savings of up to 66 per-
cent in average adult patients. For pediatric CT, even higher
dose savings can be achieved.

Further Information: www.siemens.com/Speed4D

Thanks to direct anode-cooling, Straton-
equipped scanners permit several long-range
scans without cooling breaks.
There are two steps in CARE Dose4D, the new approach to automated X-ray dose optimization and reduction. The first step represents the automated adjustment of the overall dose level depending on the patient size and is based on the attenuation values obtained by refined data analysis from a single topogram. This data determines the maximum level of the tube current (mA) for each slice to be scanned during the volume acquisition. The second step is the real-time adjustment of the tube current during the scan, based on the attenuation of the X-ray beam. Up to 2320 views per second are evaluated to optimize the mA level from view to view depending on the scan region. This refined online analysis is the basis for consistent, high quality images at the minimal X-ray dose possible – without estimated attenuation or pre-programmed mA values. The tube current is automatically adjusted to the precise level needed – slice by slice, and angle by angle, during the entire acquisition, covering the full dynamic range of 500 mA down to 30 mA with a unique change rate of up to 300 mA in only 100 ms. This real-time approach has demonstrated significant advantages by means of dose reduction and image quality optimization over purely topogram-based methods that can only rely on very coarse information on external anatomy dimensions.

Instead of just taking into account the patient’s external dimensions and apparent size, CARE Dose4D analyzes the cross-sectional anatomy in real-time and adjusts the emitted X-ray dose accordingly. It provides excellent image quality with minimized exposure.
What do you think of the new Straton tube in terms of image quality?
We have been using the new Straton tube now for ten months. The first tube is still installed and is operating well since then without any major problem. This tube constantly delivers the image quality we are expecting to get from the SOMATOM Sensation 16 CT scanner. Because of its unique options some of the examinations are performed exclusively on the one system that is equipped with the Straton tube. We appreciate the high scan speed, low image noise and high resolution which the Straton tube allows us to achieve.

Are there any dedicated examinations that profit from Straton?
One of the examinations that profit most from the Straton tube is cardiac CT: With this tube, the gantry rotation time could be reduced down to 0.37 s, allowing for a temporal resolution up to 90 ms. Shorter gantry rotation time requires higher X-ray output from the tube in order to obtain low image noise. The Straton tube is able to more than compensate for this need. To examine patients with a body mass index of 30 was a challenge with the former X-ray tube. With up to 750 effective mAs the Straton now makes it possible to examine the heart of even obese patients with an acceptable image noise.

We have also found a substantial improvement for CT angiography with the Straton tube. Both the general use of 100 kVp and the short rotation times make it possible to reduce the amount of contrast media necessary for the investigation and therefore reduce the risk of contrast induced nephropathy. Only the Straton tube is able to deliver enough X-ray energy to acquire CT angiography data with a sufficiently low image noise at 100 kVp, so that 2D and 3D post-processing with good image quality is possible.

Furthermore we have seen an improvement in the quality of high resolution CT images of the temporal bone. The focus of the Straton tube is small enough to display the finest details of the bone structures in the middle and inner ear.

Why is rotation speed so important in CT examinations?
Rotation time is particularly important for utilization of contrast media in the first pass. This is a critical issue in most applications of CT angiography. With the improvement of temporal resolution in a real partial scan (single sector reconstruction) down to 190 ms cardiac imaging could be greatly improved in patients with lower heart rates. Even the right coronary artery is now visualized without motion artifacts in those patients.

Short scan times are also important in emergency situations, such as in severely traumatized patients. These patients can be scanned from the head to the knees with one single scan and within a shorter scan time. No compromise in image quality concerning noise and spatial resolution has to be made. The parenchymal organs, bowel, vessels and the musculoskeletal system can be visualized with excellent quality utilizing both MPR and VRT.
NEWSSOMATOM SESSIONS 13   11
CARDIAC CT RESEARCH

First Flat-Panel CT Prototype at the MGH

The Department of Radiology at the Massachusetts General Hospital (MGH) in Boston and Siemens Computed Tomography Division have initiated a joint research program aiming to push cardiac CT imaging to its limits. On top of the collaboration of the MGH with the Siemens Magnetic Resonance Division, the installation of a SOMATOM Sensation 16 scanner in March 2003 opened the opportunity of combined evaluation of both modalities in research and practice. "Since the installation of our 16-slice CT scanner we have ramped up our program to more than three clinical cases per day, and our referring physicians assure us that we obtain useful clinical information in every single case," states Dr. Stephan Achenbach, Cardiologist and visiting researcher at the MGH.

The collaboration has entered a new era with the installation of the first flat-panel CT scanner prototype from Siemens in November 2003. With access to both systems the MGH researchers will be able to explore the clinical role of cardiac CT today and in the future. The new research prototype system will be used for ultra-high-resolution imaging of atherosclerotic plaques in post-mortem experiments. "Based on the unprecedented spatial resolution, new information on atherosclerotic plaque composition can be obtained that may be of relevance for future treatment to prevent plaque rupture and subsequent acute coronary syndromes," says Dr. Thomas Brady, head of the Cardiac MR CT Program at the MGH.

Images of a coronary stent phantom. The degree of the in-stent stenosis can be assessed exactly.

Disclaimer
Both new systems are work in progress and are not commercially available in the U.S.
The recent installation of a Siemens SOMATOM Emotion 6 CT scanner at the distinguished Collom & Carney Clinic (CCC) in Texarkana, Texas, is another example of why Siemens CT systems are the recognized leaders in this technology. The installation of the 2000th SOMATOM Emotion marks a milestone for one of the most successful Siemens CT systems, with an average of more than 500 units sold per year worldwide since the first model was introduced less than four years ago.

“We chose the SOMATOM Emotion 6 because it delivered the two key features our radiologists wanted in a new CT, namely improvement in quality and increase in patient throughput,” states CCC CEO Tom Simmons. “Our technicians report that the system is operating ‘beautifully’, so we are very pleased with our choice.” Dr. Charles Borrell, CCC radiologist, says: “I recommended the purchase of a SOMATOM Emotion 6 because it was the best system at the best price for our needs. I especially like its high image quality and workflow – its speed has expanded our patient throughput by at least fifty percent.”

“In addition to cost-effectiveness, CCC was also excited about the submillimeter detector design of the SOMATOM Emotion 6,” Michael Hailey, SMS CT Product Sales Executive, reports. “It’s a key innovative feature that enables thinner slices and true isotropic resolution that assure higher image quality, and makes it possible to view images from a variety of angles without losing image quality.” This can benefit radiologists, who now have the ability to make a more accurate diagnosis quicker and easier. And the 6-slice CT is also welcome by patients since it enables shorter breath holds and faster exams.

**SOFTWARE UPDATE**

**New Software available for installed SOMATOM CT Systems**

As part of the syngo Evolve Package, the new software VA47 is available for installed SOMATOM Sensation 4, Volume Zoom, Volume Access, Emotion Duo, Emotion, Balance, Esprit+ and Esprit CT systems. The VA47 software provides various new features such as new kernels for improved low contrast detectability, or direct access to online information and services directly from the scanner console (see also page 32). And – depending on the system configuration – it facilitates innovative new clinical applications such as syngo Colonography, syngo LungCARE CT, syngo VRT, syngo Fly Through and syngo Vessel View. The upgrade package is available on the mentioned SOMATOM scanners to customers with a syngo Evolve contract as part of a Siemens Service contract. It then will be installed gradually until mid 2004. More information about the syngo Evolve Package or VA47 software can be obtained online. For questions regarding the individual Evolve status of a CT scanner the local Siemens representative should be contacted.

Further Information: www.siemens.com/ct-evolve
SOMATOM Smile

Break even with one Examination a Day

The SOMATOM Smile CT Scanner intelligently combines latest medical diagnostic technology with easy use and cost-effectiveness. Beside the affordable purchase price the system offers life cycle costs that are only half of comparable systems, making it possible to break even with only one examination a day. Minimized space requirements and all inclusive delivery enhance the product’s economical attractiveness. The plug and play-system can be installed within a few hours. Using a newly developed Interactive User’s Training and intuitive software, operators can start scanning without extensive application training. A new Do-it-Yourself-System for fixing problems and exchanging spare parts keeps maintenance and service costs very low.

Gary McKnight, Business Manager from Topeka ENT in Kansas, USA, didn’t focus on the financial benefits at first. However the purchase resulted in a great financial success: “We’re a busy practice, we see about 150 patients a day. We didn’t open up the SOMATOM Smile thinking it was going to bring in huge amounts of revenue. We certainly hoped it would pay for itself. I am happy to report it is going to do better than that.”

At the same time, the patient also benefits from a better and faster examination. Gary McKnight says: “I can look anyone in the eye and say that financial savings aside, we can truly deliver better patient care because we purchased the SOMATOM Smile. We are a better clinic because we made this decision.”

Calculation Example

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment (purchase price + financing)</td>
<td>$220,000</td>
</tr>
<tr>
<td>Staffing (e.g. technicians’ salaries)</td>
<td>$100,000</td>
</tr>
<tr>
<td>Building (e.g. rent/space allocation, initial site preparation)</td>
<td>$20,000</td>
</tr>
<tr>
<td>Service &amp; maintenance (including tube exchanges)</td>
<td>$80,000</td>
</tr>
<tr>
<td>Other costs (e.g. supplies, power consumption)</td>
<td>$15,000</td>
</tr>
<tr>
<td><strong>Total expenses after five years</strong></td>
<td><strong>$435,000</strong></td>
</tr>
</tbody>
</table>

Assuming 250 working days per year and $250 average revenue per examination over a five year timeframe the SOMATOM Smile requires just one examination per day for break even:

\[
\text{Break even: } \frac{\$435,000}{\$250 \times 250 \times 5} \approx 1
\]

WEB-BASED TRAINING

New Applications on syngo Web-based Training

The new syngo Colonography web-based training (WBT) and an update of syngo LungCARE WBT are the latest expansions of syngo WBT. Members of CT’s Life User Lounges can enter these as well as in-depth trainings on syngo 3D, syngo VRT, syngo Fly Through, and syngo Vessel View online in both German and English versions. The syngo basic training in English, explaining patient browser, viewing and filming, is available there for non-members also. The syngo WBT was implemented using Macromedia Flash, enabling small file sizes totaling eight megabytes. Thus it may be used via both ISDN or modem, but can also be ordered on CD.

Further Information: www.siemens.com/SOMATOMEducate
Operational flexibility and streamlined efficiency are mutually exclusive? Not true for today’s medical imaging systems, where effective workflow solutions are demanded for a wide range of users, from the major university enterprise, to community hospitals and specialist clinics. Each have their individual requirements and budget constraints, yet all demand the most cost-effective solution for their particular situation. Can “one solution for all” deliver the perfectly optimized system for every customer? 

In response, Siemens has developed syngo, a single, comprehensive software platform for use by virtually all imaging modalities. syngo is already proven over more than five years at thousands of customer sites, and is the basis of the Siemens workflow solution WorkStream™. Not only is syngo featured in virtually all major imaging modalities, MR, CT, X-ray and Nuclear, but syngo is also used in virtually every console and postprocessing workstation. syngo includes a wide range of features, from image data access to 2D/3D processing, virtual endoscopy and multi-modality image fusion. In addition, each modality has its particular clinical applications, also syngo-based, that seamlessly extend the base platform: relevant applications can therefore easily be made available on whichever system you desire. The software is transportable and the consequences for users are profound. Each radiology suite can be tailored to specific needs: a small practice with a single modality and only one console; a large radiology department with several modalities and radiologist softcopy reading suite, where scanner throughput is optimized using one technologist for exams, and one for image reformat and documentation. These are very different scales of enterprise, yet all can be available with virtually the same clinical functionality through the common, transportable syngo software.

The commonality of syngo software also allows workplaces to be configured for different roles. Consoles and second consoles for technicians, in-theatre workplaces, advanced post-processing and reading workstations. Workplaces can be configured for individual clinical roles, as in cardiology, or be dedicated to specific tasks such as preventive care. User effectiveness is also impacted. syngo is the same whether used on SOMATOM Sensation, on AXIOM Artis, or the multi-modality LEONARDO workstations. The same software, the same look and feel, the same workflow features, and the same intuitive style for the user interface. This can result in less training, increased efficiency and fewer errors. Finally, syngo includes a consistent and comprehensive set of workflow features that ensure maximum efficiency is achieved: close integration with HIS/IRIS through NOVIUS and SOARIAN provides access to online patient information, modality worklist and a record of performed procedures; study protocols ensure that all exams are executed with minimal operator intervention; operator load is reduced using automation features such as multiple pre-defined reconstructions, auto-routing and auto-filming; even image processing tasks are streamlined due to protocol-linked features that automatically select the optimal display type, image reformat parameters, rendering presets and even screen layout.

As the financial pressure increases on healthcare systems so will the drive for efficiency. Software workflow solutions such as syngo will continue to deliver these improvements thereby freeing clinical staff from routine technical tasks and allowing them instead to concentrate fully on the patient.
Case 1: Atypical Dissection of Internal Carotid Artery

By Bernd J Wintersperger, MD, Department of Clinical Radiology, University Hospital Munich-Grosshadern, Germany

HISTORY

A 49 year old male patient presented with Horner syndrome and paresis of the abducens nerve. Magnetic resonance imaging did not reveal any signs of cerebral ischemia. Intracranial time-of-flight (TOF) MR angiography showed an abnormal internal carotid artery (ICA) just below the base of the skull suspicious of an ICA aneurysm. Carotid CT angiography was performed to answer this question.

DIAGNOSIS AND COMMENTS

Carotid CT angiography showed normal origins of the arch vessels and non remarkable common carotid arteries (CCA) on both sides. Also the carotid bifurcation was normal on both sides. There was no evidence of atherosclerosis at this level. The ongoing ICA course on the left side did not show any abnormalities. On the right side ICA enlargement (max. 1.3 cm) was revealed just below the base of the skull with partial thrombosis. Following that aneurysm a hypodense membrane was depicted which extended into the ICA canal. At this level the true lumen of the right ICA was compromised. Within the ICA canal the dissection membrane ends showing a normal intracranial ICA segment. The intracranial part of the CT angiography showed a normal circle of Willis with its major branch vessels.

Carotid CT angiography with 16 detector-row CT is a standard application and is commonly performed from the aortic arch to the vertex to assess the whole course of the extracranial vessels as well as the intracranial vessels. To optimize arterial vessel enhancement and in order to avoid venous superimpositions, we routinely use a testbolus approach in this application. The standard scan start delay is calculated from the peak maximum enhancement (PME) at the level of the carotid bifurcation by subtraction of 2 seconds. Standard post-processing in assessment of carotid artery stenosis is performed using thin MIP projections (5 mm thickness). Additional volume rendering gives a comprehensive overview of the vessel course and also demonstrates intra- or extracranial aneurysms. However, as shown in this case, thin axial source images or thin multiplanar reformats (MPR) are beneficial in suspicion of carotid artery dissection to demonstrate an even thin dissection membrane within the vessel lumen. Together with non-enhanced cranial CT and dynamic CT perfusion measurements this CT angiography protocol is also routinely used in assessment of acute stroke. The use of 100 kV protocol for CT angiography leads to improved vessel enhancement based on a higher attenuation level of iodine.

EXAMINATION PROTOCOLS

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scanner</td>
<td>SOMATOM Sensation 16</td>
</tr>
<tr>
<td></td>
<td>with the Straton tube</td>
</tr>
<tr>
<td>Scan Area</td>
<td>From aortic arch to the vertex</td>
</tr>
<tr>
<td>Scan length</td>
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</tr>
<tr>
<td>Scan time</td>
<td>20 s</td>
</tr>
<tr>
<td>Scan direction</td>
<td>Caudo-cranial</td>
</tr>
<tr>
<td>kV</td>
<td>100 kV</td>
</tr>
<tr>
<td>Effective mAs</td>
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<td>Reconstruction increment</td>
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<td>AB20</td>
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<td>Contrast</td>
<td>non ionic contrast media (300 mg iodine per ml)</td>
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<td>Volume</td>
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</tr>
<tr>
<td>Flow rate</td>
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</tr>
<tr>
<td>Start delay</td>
<td>17 s</td>
</tr>
<tr>
<td>Postprocessing</td>
<td>Multiplanar Reformat (MPR), thin Maximum Intensity Projection (thinMIP), Volume Rendering (VR)</td>
</tr>
</tbody>
</table>
[1] Right anterior oblique volume rendered image (syngo InSpace) showing a normal left carotid bifurcation (arrow head), and a normal external carotid artery (small arrows). In addition parts of the left vertebral artery loop can be seen (large arrow).

[2] Right carotid bifurcation (arrow head) and proximal internal carotid artery (ICA, small arrows) can be nicely depicted without any pathology using volume rendered display (syngo InSpace).

[3] Anterior view of the whole data set using volume rendering (syngo InSpace) with an applied anterior clip plane allows visualization of both common (CCA) and internal carotid arteries. Within the course of the internal carotid arteries artificial stenosis can been seen (arrow heads) based on dental artefacts.

[4] A series of overlapping coronal thin maximum intensity projections (thin MIP; 5mm) shows an ICA aneurysm (small arrows) just below the base of the skull (A–C). Also a dissection membrane can be depicted in part of the data set (B, C).
**CLINICAL OUTCOMES**

[5+6] With additional editing of the data set applying clip planes, volume rendering nicely shows the distal ICA (arrows) and the opacified part of the aneurysm (arrow heads). Note again the artificial stenosis within the ICA based on dental artefacts.

[7] A series (A-D) of thin axial multiplanar reformats (MPR) follows the opacified aneurysmal sac (A, B; small arrows) and allows verification of the dissection membrane (C; large arrow). In the distal part of the petrous canal, a normal ICA is seen (arrow head).

[8] Beside visualization and judgement of the common and internal carotid artery, the data set also covers the vertebral arteries, the basilar artery and the circle of Willis. The volume rendered image from posterior shows normal middle cerebral arteries (large arrows), normal anterior cerebral arteries (small arrows) and a normal basilar artery (arrow heads). Note the hypoplastic left vertebral artery (left VA).
Case 2:  
Left Main Coronary Stent Patency with 16-row MSCT Coronary Angiography

By Filippo Cademartiri, MD, and Nico Mollet, MD, Department of Radiology and Cardiology, Erasmus Medical Center, Rotterdam, The Netherlands

CLINICAL HISTORY

A 62 year old male (height 1.82 m, weight 82 kg) presented without any clinical symptoms. His profession required an annual routine clinical check-up and an ultra-sound examination of the heart was performed. This examination found an abnormal left ventricle function (ejection fraction of 35 %, and diffuse hypokinesia of the left ventricle). A thallium-scintigraphy scan confirmed these findings and showed reversible ischemia in the antero-lateral and apical parts of the left ventricle. A conventional coronary angiogram was subsequently performed showing a significant obstructive lesion located at the distal part of the left main coronary artery, expanding in the proximal parts of the left anterior descending (LAD) and circumflex coronary artery (LCx). The patient underwent immediate percutaneous coronary intervention, and three drug-eluting stents (paclitaxel-coated stents, diameter size 3.5 and 3.0 mm) were placed. The patient underwent a follow-up conventional angiogram after three months, and a MSCT coronary angiography scan was performed the same day.

EXAMINATION PROTOCOLS

<table>
<thead>
<tr>
<th>Scanner</th>
<th>SOMATOM Sensation 16 with the Straton tube</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scan Area</td>
<td>From carina to diaphragm</td>
</tr>
<tr>
<td>Scan length</td>
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</tr>
<tr>
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<td>18.6 s</td>
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</tr>
<tr>
<td>Heart rate</td>
<td>67 bpm (no ACV)</td>
</tr>
<tr>
<td>kV</td>
<td>120 kV</td>
</tr>
<tr>
<td>Effective mAs</td>
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<tr>
<td>Pitch</td>
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<td>0.5 mm</td>
</tr>
<tr>
<td>Kernel</td>
<td>B30f</td>
</tr>
</tbody>
</table>

| Contrast                 | Iomeron (400 mg Iomeron/ml)                |
| Volume                   | 80 ml Iomeron + 40 ml saline               |
| Flow rate                | 4 ml/s                                     |
| Start delay              | 10 s                                       |

DIAGNOSIS

MSCT coronary angiography allows reliable visualization of the coronary lumen inside the stent, thus assessment of stent patency. This scan clearly demonstrates the absence of in-stent restenosis. These findings were confirmed on the conventional angiogram.
Curved multiplanar reconstructions of the circumflex- (A) and left anterior descending coronary artery (B) demonstrate stent patency due to contrast material inside the lumen of the stents.

Anterior view of the heart using volume rendering techniques after segmentation of the thoracic wall. (PT=pulmonary trunk, VCS=vena cava superior, RV=right ventricle, LV=left ventricle, RCA=right coronary artery).

Evaluation of the coronary lumen inside stents using older 16-row MSCT scanners was hampered by beam-hardening artefacts (related to high-density structures) and motion artefacts. The use of a higher tube current increases the signal-to-noise ratio and reduces beam-hardening artefacts. Faster tube rotation time reduces the frequency of motion artefacts due to coronary motion. These features allow assessment of stent patency in larger stents with a high confidence.

16-row MSCT coronary angiography allows non-invasive follow-up of patients after implantation of proximal stents, which could result either in replacement of conventional angiography or in a more extensive follow-up of these patients.
[3] VRT images: Lateral (A) and cranial view (B) of the heart after complete segmentation of the pulmonary vessels, and partial segmentation of the pulmonary trunk and cardiac atrii. These images give an anatomic overview of the course of the main coronary arteries and localization of the stents (D1=Diagonal artery).


Case 3:
Evaluation of Abdominal Arteries

The application *syngo* Vessel View is a dedicated tool for 3D visualization and analysis of vascular structures and provides therefore valuable clinical informations e.g. to presurgery planning. *Syngo* Vessel View enables the accurate quantification of vessel lesions. In addition, direct measurements in 3D-volume data sets are provided. The key features of this program are: automated vessel segmentation and accurate stenosis quantification.

The capabilities of *syngo* Vessel View are demonstrated on the examination of abdominal arteries.

**HISTORY**

A 69 year old patient was referred for a CTA scan to examine a follow up on stent patency, implanted in the stenotic left renal artery six months ago. In addition, aneurysm of abdominal arteries should be excluded.

**DIAGNOSIS AND COMMENTS**

In this case, *syngo* Vessel View facilitates measurements of the diameter and cross-sectional area of the aorta as well as evaluation of stent patency in the left renal artery. Evaluation begins with placing seed points along the vessel and starting automated segmentation. Having visualized and segmented the vessel the surrounding structures are shown as a transparent VRT. After the vessel segmentation, the selected vessel is loaded into the Vessel Navigator which allows the accurate measurements of the vessels diameter. The lumen of the stent was clearly displayed and showed to be open. Abdominal aneurysms were excluded.

The noninvasive evaluation of the vessels and landmark based reporting, using CT and *syngo* Vessel View, enables physicians to make a more accurate treatment plan prior to possible interventional procedures.

**EXAMINATION PROTOCOLS**

<table>
<thead>
<tr>
<th>Scanner</th>
<th>SOMATOM Sensation 16</th>
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</thead>
<tbody>
<tr>
<td>Scan Area</td>
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<tr>
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<tr>
<td>kV</td>
<td>120 kV</td>
</tr>
<tr>
<td>Effective mAs</td>
<td>240 mAs with CARE Dose</td>
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<tr>
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<tr>
<td>Slice collimation</td>
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</tr>
<tr>
<td>Slice width</td>
<td>1.5 mm</td>
</tr>
<tr>
<td>Table feed / rotation</td>
<td>10.0 mm</td>
</tr>
<tr>
<td>Reconstruction increment</td>
<td>0.75 mm</td>
</tr>
<tr>
<td>Kernel</td>
<td>B20f</td>
</tr>
</tbody>
</table>

**Contrast**

*Non ionic contrast media, 100 cc*

**Postprocessing**

*syngo Vessel View*

---

[1] Analysis of stent patency in the left renal artery. The Vessel Navigator shows a longitudinal cut along the aorta as Ribbon-MPR (bottom, right). Patency of the stent (arrow) placed in the left renal artery can be evaluated (bottom, right). In addition the axial MPR of the vessel with a profile curve is displayed (bottom, left).
syngo Colonography

syngo Colonography is a non-invasive and comfortable diagnostic tool to locate and evaluate lesions in the colon. The early detection of colon polyps and other lesions in the large intestine with subsequent follow-up and appropriate treatment may dramatically increase cure and survival rate. Additionally CT colonography plays an important role after incomplete colonoscopy in patients with clinical suspicion of colonic malignancy – not only for evaluation of the colon but also for the evaluation of extracolonic structures.

In combination with CARE Dose™ the technique offers a tool to significantly reduce the effective dose applied to the patients. CARE Dose allows adapting the tube current online, based on the patient’s attenuation. Further improvement of the image quality can be achieved by increasing the tube current slightly in the projections with high attenuation (typically lateral direction) and reducing the tube current in the projections with low attenuation (typically a. p. direction).

Significant dose reduction with improved image quality has been reported (1)(2). The cases presented describe the abilities of CT Colonography to support the diagnosis of the physician.


By Michael Macari, MD, & Alec J. Megibow, MD, MPH, FACR, Department of Radiology, New York University Medical Center, Tisch Hospital, USA

Case 4: Positive CT Colonography after negative Colonoscopy

By Michael Macari, MD, & Alec J. Megibow, MD, MPH, FACR, Department of Radiology, New York University Medical Center, Tisch Hospital, USA

HISTORY

A 75 year old asymptomatic male was evaluated by conventional colonoscopy and CT colonography. The colonoscopist reported that his study was normal.

DIAGNOSIS AND COMMENTS

The endoluminal view from CT colonography displays a polyp in the proximal rectum [Figure 1]. The polyp was measured in the evaluation mode at 0.97 x 0.65 cm [Figure 2]. The polyp was “hidden” behind a prominent rectal fold [Figure 3 a and b]. The patient underwent a second endoscopy and the lesion was removed. Histologic examination revealed a tubulovillous adenoma.

1 cm polyps are considered lesions which should be removed. The ability to detect these lesions with sensitivities greater than 90% makes CT colonography a promising tool.

EXAMINATION PROTOCOLS

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
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</thead>
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<td>Scan direction</td>
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<td>kV</td>
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<tr>
<td>Effective mAs</td>
<td>45 mAs with CARE Dose*</td>
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Contrast: No contrast media has been used

Postprocessing: syngo Colonography

* Real-time dose modulation
for surveying the colon for polyps. Polyps hidden behind folds are a well documented source of error for conventional colonoscopy. The ability to easily "fly through" the data on the Wizard or LEONARDO workstation allows the radiologist "free access" to both sides of each colonic fold.

[1] Polyp detected on endoluminal view.

[2] The polyp is measured in both diameters using the "Evaluation" mode on orthogonal 2-D images derived from syngo Colonography.

[3a] The arrow delineates the polyp – notice how it projects from the superior aspect of the colonic fold.

[3b] 3-D endoluminal image labeled to show the relationship of the polyp to the adjacent fold. Polyps such as these are difficult to detect by conventional colonoscopy.
Case 5:  
CT Colonography after incomplete Colonoscopy

By Elvier Mussen, MD, Patrick Bellinck, MD, Tom Mulkens, MD, H. Hart Hospital, Lier, Belgium

HISTORY
A 66 year old man was referred for colonoscopy with clinical high suspicion of a colonic malignancy because of high levels CEA. Conventional colonoscopy failed to show the entire colon due to difficulties in reaching the right side. In suspicion of a colonic malignancy the patient was referred to the Radiology Department for a CT colonoscopy to exclude a tumour of the colon.
The patient underwent bowel cleansing and low fibre-diet for 3 days prior to the examination. For fecal tagging barium sulfate was used.
A fully cleansed colon is crucial for a successful CT colonography. The bowels were inflated with air and non-contrast spiral acquisition of the whole abdomen was performed. A single scout CT image was performed to verify adequate distension of the colon [1]. The CT scan was performed in the supine position first, followed by a scan in prone position.

EXAMINATION PROTOCOLS

<table>
<thead>
<tr>
<th>Scanner</th>
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<td>76 mAs with CARE Dose*</td>
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<td>B41s</td>
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Contrast
No contrast media has been used

Postprocessing
syngo Colonography

* Real-time dose modulation

DIAGNOSIS AND COMMENTS
The 3-dimensional endoluminal CT image reveals a sessile polypoid semicircular mass with intraluminal growth at the internal bordan of the cecum over a distance of 8 to 9 cm [2, 3]. The lesion is highly suggestive for colonic malignancy. The colonographic CT image shows possible extension of the tumour to the ileocecal valve of Bouhin and to the terminal ileum. Remarkable at the coronal and transversal colonographic CT images is also the obliteration of pericecal fat-interfaces and the thickening of the adjacent fascia. Both signs indicate extra-colonic tumor spread. Besides these findings CT colonographic images show extra-colonic abnormalities. These include a highlighting of the mesenteric fat suggestive for mesenteric metastasis and suspect liver lesion, a pulmonary coin lesion at the base of the left lung, an osteolytic spine lesion of the body of T11 highly suspicious of a bone metastasis and enlarged retroperitoneal lymph nodes [4]. The reason for incomplete colonoscopy has been identified as extremely elongated tortuous colon loops which were difficult to pass with the endoscope.
The patient’s diagnosis was a malignant tumor of the cecum ascendens with enlarged retroperitoneal lymph nodes and metastases of the bone and possible of the liver. The patient subsequently underwent a right hemicolectomy and was referred to clinical oncology. The CT image visualizing liver lesions and the enlarged retroperitoneal lymph nodes were confirmed during abdominal exploration. Histologic analysis of the tumoral lesions showed moderate graded adenocarcinoma [4].

This case demonstrates the important role of CT colonography after incomplete colonoscopy for patients with clinical suspicion of colonic malignancy, not only for evaluation of the colon but also for the evaluation of extracolonic structures. Our experience correlates with those of the literature. CT colonography has been proposed as an alternative procedure for the examination of those patients who have had an incomplete colonoscopy. It reaches the cecum even in cases of obstructive lesions and combines the study of the colon with the evaluation of extracolonic structures (1–5).
[1] Topogram as scout CT image to verify adequate distension of the colon.

[2] Endoscopic view of the stenosis with correlation to axial image (top right), coronal MPR image (top left), global VRT displaying the long distance to the stenosis (bottom left) and virtual endoscopic view of the colon using the fly-through mode (bottom right).

[3] Virtual endoscopic view of the sessile polypoid semicircular mass in the conventional forward (A) and reverse (B) direction.
CLINICAL OUTCOMES


SOMATOM Sensation

SOMATOM Volume Zoom

SOMATOM Emotion

[4] Besides CT Colonography extra-colonic abnormalities were visualized. (A) Pulmonary coin lesion (arrow) at the base of the left lung; (B) Metastatic lesion of the body of T11 (dotted arrow) and a liver metastasis (dotted arrow); (C) Enlarged retroperitoneal lymph nodes (arrow); (D) Histologic analysis of the tumoral lesions shows moderate graded adenocarcinoma.
CT colonography has been an investigational tool for the evaluation of the colonic mucosa for over ten years. Initial clinical applications and utilization were evaluated using single slice CT technology. Although a fairly representative display of the colonic surface could be acquired only by slice broadening inherent in high pitch, respectable results for detecting polyps greater than 1 cm were achieved (1). One of the earliest applications of this technique was for patients with an incomplete conventional colonoscopy, with failure of identification of the cecal landmarks. The completion rate of colonoscopy is operator dependent. A highly skilled colonoscopist may have a 98-99% success rate in total colonic evaluation (2). Conversely, less experienced colonoscopists achieve between 70-75% of total evaluation (3). Even in the best of circumstances, 5-10% of the mucosal surface may not be visualized.

CT colonography is limited by the inability to distend a segment of the colon. This is alleviated to some degree by dual acquisitions for examinations in both the supine and prone positions. Antispasmodics have been used to help relax the bowel. However, their routine use has not been widely endorsed in the literature. In patients with severe spastic diverticular disease, in whom it may be impossible to distend the bowel sufficiently to pass an endoscope or a column of barium or water soluble contrast material, CT colonoscopy also may not provide evaluation of that particular segment. Multidetector-row CT scanners (MDCT) allow image data to be acquired with voxels approaching isotropic dimensions (4). This single property significantly improves z-axis resolution, contrast resolution and, most significantly 3-D evaluation. The first significant benefit which patients realize is the ability to acquire CT colonographic studies at considerably lower effective mAs. Macari and co-workers have shown no decrease in sensitivity for detection of polyps greater than 7 mm in size between 4 detector row CT performed with an effective mAs of 50 and single slice CT performed at an effective mAs of 200 (5). European investigators have effective mAs of 10 and have maintained a sensitivity of greater than 90% for polyps greater than 7 mm in diameter (6).

The second benefit of MDCT colonography relates to improved 3-D capabilities. The high quality endoluminal images allow radiologists to re-evaluate the utility of the 3-D mode of analysis with 2-D MPR images as the “back-up”. This may speed workflow compared to the current utilization of 2-D analysis and 3-D for distinguishing polyp from fold. The other major benefit of isotropic voxel acquisitions is the ability to apply computer assisted diagnosis (CAD*) to CT colonography. CAD applications currently under investigation by various research groups include improved segmentation for more accurate polyp measurement, and improved surface detection for better polyp delineation. CAD segmentation techniques are being applied to so-called electronic cleansing following the tagging of fecal material with a variety of oral agents. The ultimate goal of CAD will be to have user friendly tools which can facilitate automatic polyp detection.

The current syngo Colonography application has several features which distinguish its performance among other competing products. The 3-D virtual endoscopic mode is user friendly and, combined with a surface rendering program, simulates the colonic surface in a realistic way. There is easy cross referencing of the 3-D image to the 2-D MPR. The “marker” feature allows the user to review all suspicious areas discovered during the fly-through and convert them into a report which includes measurements, location within the colon and an assessment of the likelihood that the defect is a true polyp. Further refinements which are being tested include more functionality from the global view of the colon, and a system which allows the user to determine any segments which are not looked at so that a complete exam can be documented.


*CAD is work in progress and is not commercially available in the U.S.
The method of choice for detecting pulmonary nodules is thin-sliced computed tomography (CT). Results of still ongoing studies show that even experienced radiologists commonly miss small pulmonary nodules. So, any tool that can increase the reader’s accuracy clinically useful. The rate of missed findings increases with small diameter and within certain localizations, e.g. the hilar and central region of the lungs.

Siemens Medical Solutions has developed a software tool named NEV (Nodule Enhanced Viewing), which is optionally embedded in the evaluation software syngo LungCARE designed to support the physician in confirming the presence or absence of identified lung lesions (e.g. nodules). NEV is capable of supporting an experienced radiologist reader in confirming and evaluating spherical structures whose gray value corresponds to the value of normal lung lesions and connected voxels. These structures are suspicious of being a pulmonary nodule.

Due to the workflow of the NEV software, the tool can support the radiologist in his second reading. As NEV supports the reader in Slab-View, the user reviews the whole volume in order to confirm his findings. NEV is intended to assist the physician in confirming the presence of identified lung lesions and supports the user with automated segmentation for the visual identification of possible lesions.

The well-accepted syngo LungCARE workflow guides the radiologist through all necessary reporting steps. One of these steps is the close up inspection of the structure of interest. In this 3D visualization the radiologist can decide accurately whether the structure under inspection is a nodule or not. The final reporting takes place only after the radiologist has filled out a nodule description form and accepted the entries.

In a test sample which contained 600 true pulmonary nodules identified by a three reader consensus, NEV was able to guide the radiologist to 180 additional structures which could then be identified as true nodules by the radiologist with the tools of syngo LungCARE (1). These 180 structures were overlooked by all readers during their individual first read. So NEV has proven its clinical utility. It is a promising step forward in the future development of CAD applications (CAD = Computer Aided Detection).

(1) Herzog Peter, MD, to be presented at the RSNA 2003, Chicago, USA
Case Study
syngo LungCARE in Clinical Practice

By Peter Herzog, MD, Department of Radiology, University Hospital Munich-Grosshadern, Germany

The new software was applied to a case where a pulmonary nodule was found in a patient examined for lung cancer screening.

HISTORY

A 46 year old woman was admitted as an outpatient to our department of clinical radiology for lung cancer screening. In the first row we rejected the patient because she did not meet our inclusion criteria for lung cancer screening. Our inclusion criteria are

• Age of 50 year and older
• Inhalative (cigarette) smoking of 20 or more pack years or (occupational) exposure to one of the following noxes:
  • asbestos
  • uranium dust (miners)
  • argon gas
  • other (inhalative) noxes that increase the risk of developing lung cancer

After a short anamnesis, where she told us that her mother died from lung cancer at an age of 49 years and her sister is currently receiving palliative cancer treatment for small cell lung cancer, she was included and accepted for lung cancer screening, although she was only exposed to five pack years of inhalative cigarette smoking in younger years because she stopped smoking when the fatal disease of her mother was diagnosed.

DIAGNOSIS

The patient received a baseline CT screening in August 2002. The human reader found four pulmonary nodules; a fifth was additionally detected by a prototype of the NEV-tool, which was in clinical evaluation at that time in our institution. All nodules had diameters from 2 to 5 mm.

According to the recommendations of the society of thoracic radiology a follow up scan was performed about six months later in February 2003.

[1] Nodulous structure guided by NEV and confirmed by the reader.
The patient was immediately referred to the department of thoracic surgery in our hospital and received a video assisted thoracotomy including an atypical pulmonary resection. After these minimal invasive surgical interventions the patient recovered quickly and is now doing fine. Histological workup of the resected pulmonary tissue revealed a T1 small cell lung cancer. A contrast enhanced CT scan performed as an aftercare examination shows that the small tumor was fully resected and no metastases could be detected.

The patient is now scheduled for an annual lung cancer screening because of the still imminent risk of developing a second malignoma within the lungs although she still does not meet our inclusion criteria. Her sister died in the meantime from her lung cancer which was detected in a late, symptomatic stage and which was not resectable at that point in time.

In this case [Fig. 1] NEV was able to guide the radiologist to the position in the dataset where a structure met the inclusion criteria (gray value, spherical shape and connected voxel) for the automated segmentation. This nodule was overlooked by one of the radiologist readers. Therefore, NEV seems to be a helpful tool to aid the radiologist while supporting the physician in confirming the presence or absence of identified lung lesions (e.g. nodules).

One of the five pulmonary nodules in the right upper lobe showed an increase in volume measured by syngo LungCARE from 27 ccm in the baseline scan to 160 ccm in the follow up examination, while the other four nodules had a stable volume.

**EXAMINATION PROTOCOLS**

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<td><strong>kV</strong></td>
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<td>20 mAs with CARE Dose</td>
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**Contrast** None

**Postprocessing** syngo LungCARE with NEV*

*option

[2] VOI (Voxel of Interest) view of the nodule as chosen via the smart select modus out of syngo LungCARE.
Life – Building Successful Partnerships

Henry Ford, the American engineer and entrepreneur, once said “coming together is a beginning, staying together is progress and working together is success”. With this essence in mind, the Siemens Computed Tomography customer care program SOMATOM Life has been so successful that Siemens Medical Solutions decided to introduce a comprehensive customer care program called “Life” for all modalities. Life, the integrated customer care program for CT, currently consists of seven programs and services focusing on two key areas designed to strengthen the relationship between customers and Siemens Computed Tomography and to provide excellent care:

Ongoing technical support and development
- Uptimes Tailored service solutions
- SOMATOM Excel Workflow improvement services
- syngo Evolve Package Protection against early obsolescence
- SOMATOM Expand Clinical portfolio development program
- SOMATOM Elevate Managed upgrade program

Ongoing personal development
- SOMATOM Educate Application services and clinical training program
- SOMATOM World Customer community

For customers, this means being assured that Siemens will work together with them to maintain the availability of their SOMATOM CT system, with service solutions that are tailored to meet individual needs. Furthermore, Siemens wants to make sure that SOMATOM CT systems keep pace with innovation and growing clinical needs. The syngo Evolve Package offers the opportunity to benefit from software updates and hardware upgrades that will keep SOMATOM CT scanners at the cutting edge, enabling customers to further enhance their clinical and diagnostic portfolio through Siemens SOMATOM Expand program. When the time comes to think about the next CT solution, Siemens will be able to offer the right kind of product, clinical applications and training. A highly trained team of sales professionals understands the customer’s needs and future plans, and will guide customers to the next dimension in CT.

Personal development for customers and their teams begins with comprehensive applications training and support from Siemens’ team of experienced applications consultants, who will put new users on the fast track to efficient and effective use of their scanner. Users will also have access to ongoing clinical training offered by a growing panel of experts providing highly focused workshops and fellowships. What’s more, as part of a global network of SOMATOM CT users and experts they will be kept up to date with the latest innovations and clinical advances via clinical cases, SOMATOM Sessions magazine, images, discussion board and much more.

For further questions or more information, the local Siemens representative, www.siemens.com/Life or the CT customer care team at med.SOMATOMWorld@siemens.com should be contacted.

Further Information: www.siemens.com/Life
med.SOMATOMWorld@siemens.com

Disclaimer
1 The syngo Evolve Package must be purchased as part of a Siemens Service contract. For more information about syngo Evolve, the local Siemens representative should be contacted.
2 In the event that hardware or software upgrades require FDA approval, Siemens cannot predict whether or when the FDA will issue its approval. Therefore, if regulatory clearance is obtained and it is applicable to this package, it will be made available according to the terms of this offer.
SOMATOM Life @ Your Scanner is a new platform, exclusively accessible via the SOMATOM CT scanner. It is an additional channel for Siemens Medical Solutions CT division’s Life programs and services, which gives CT customers easy access to the information and services they need for everyday work at their SOMATOM CT scanner.

SOMATOM Life @ Your Scanner has a number of features and benefits, which are divided up between an off-line version, which is available to all SOMATOM CT users, and an on-line version only available to customers who have Siemens Remote Service (SRS) connectivity. It is available 24 hours a day, seven days a week, on both the Navigator and Wizard console. The platform is easily accessed by selecting “SOMATOM Life” in the “OPTIONS” menu of the syngo user interface. This brings the user directly to the off-line platform with instant access to important information about the CT scanner, such as software and hardware versions, current clinical software licenses and their expiry dates, scan and tube seconds. Additionally, the User Manual can be viewed from a CD-ROM and the syngo Basics and Advanced Applications CD-based training can be performed directly on the Navigator or Wizard console.

Customers with SRS connectivity will also be able to access a secure on-line platform. Through the on-line platform they will be able to order free 90-day clinical software, which will be automatically installed and ready for use. This means that users can easily order and try out new clinical software whenever it suits them. CD-based training, designed to help customers get the most out of the trial period, supports many of these clinical applications. The training CD will automatically be sent by mail when trial licenses are ordered via SOMATOM Life @ Your Scanner. Alternatively, the training is also available in the User Lounges (www.siemens.com/SOMATOMWorld).

The latest syngo Evolve update will bring the SOMATOM Life @ Your Scanner functionality to a wide range of installed systems. Participants of the syngo Evolve program will receive comprehensive information, including a user guide, when the Siemens Service Engineer carries out their update. For further information, the local Siemens representative or the CT customer care team at med.SOMATOMWorld@siemens.com should be contacted.

Further Information:
www.siemens.com/SOMATOMWorld
med.SOMATOMWorld@siemens.com

Disclaimers
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3 In the event that hardware or software upgrades require FDA approval, Siemens cannot predict whether or when the FDA will issue its approval. Therefore, if regulatory clearance is obtained and it is applicable to this package, it will be made available according to the terms of this offer.

Interview: Piero Stella, MD

We really wanted to get practicing with syngo Fly Through while we were waiting for the license we had bought to be delivered and installed. When our new SOMATOM Sensation 16 was installed, our Applications Consultant introduced us to the new SOMATOM Life @ Your Scanner portal. He showed us how we could request free 90-day trial software and explained that the requested trial software would be automatically installed via our Siemens Remote Service (SRS) connectivity. We couldn’t believe that Siemens could offer us something so advanced as automatic installation of 90-day free-trial software at the CT system and we were really pleased with the speed and efficiency with which we could get the trial software we wanted, when we wanted it! Altogether, we found that not only can we solve issues more quickly and efficiently via SRS, but that SOMATOM Life @ Your Scanner really adds value to the SRS supported services on offer.
Frequently asked questions

Via the SOMATOM World User Lounges, Siemens applications specialists answer your questions on “how to...” easily use your Siemens Computed Tomography scanner and applications in daily clinical practice. SOMATOM Sessions will offer a regular column with frequently asked questions for offline reference.

How do I delete a scan protocol in syngo?

With VA40 and prior syngo software, the system – Run – Restore default scan protocols menu item allows to remove user specific scan protocols (and restore the Siemens default settings, if necessary). Select P for partial deleting and then select the protocol that you wish to delete. Important: do not select A, as this will delete all but the Siemens default protocols!

Select the body group that the protocol is in BY NUMBER (no mouse click used) and hit Enter. System will ask for confirmation, click OK and the protocol is deleted.

All software beyond VA40, the user can select Edit – Delete Scan Protocol in the examination card. Choose the body group by double clicking on the group folder that the protocol is contained in, then once in the folder, choose the protocol to be deleted in the same manner. System will ask for confirmation, click OK and the protocol is deleted.

How do I change or modify a protocol and store it?

Put the table into scanning position. Set the table position to 0. Register a test patient. Patient orientation must be head first – supine. Select the protocol to be modified, and click exam. Modify the scan protocol, setting up necessary parameter changes for each scan and auto transfer destination(s) for each recon job needed on the Auto Tasking sub-task card on Examination card. Important: do not load the scan protocol. Then select Edit – Save Scan Protocol in the main menu. Select the scan protocol name in the pop-up dialog. You can either use the same name to modify the existing scan protocol, or enter a new name which will make a totally new protocol in the selection list.

What is the table weight limit?

Maximum table load for recumbent patient is 450 lbs. (per System Owner Manual, under Technical Specifications).

What type of CDs and/or MODs should be used with the syngo System?

Siemens recommends the use of medical grade CD-R. TDK and Mitsui produce medical grade CD-R discs. Full access (format, read, write) MODs that can be used are Max Optix/ Sony/TDK rewritable or WORM MODs with either 2.3 GB or 4.1 GB capacities, with 512 Bytes/sectors only. 5.2 GB capacity will not work in the system drive. CD-RW is not supported with the syngo system.

How are window width and center values changed for default presets?

Options – Configuration – Viewer – Evaluation General. In the field Default window, pick the window name you want to modify. Go to window 1 and window 2 width and center fields to make changes. Click the OK soft key. You must check the scan protocol and look under the Recon Subtask card to find out which Window name is stored in that specific protocol and change that one accordingly in options – configuration.

Patient information was manually registered incorrectly. Can I correct it after scanning is completed?

Under local database, select the specific patient folder, study folder, or series folder level that needs to be edited. Selecting the patient folder level will affect all studies and series for that patient. Selecting the specific study folder will affect all the series located in that specific study folder. Selecting the series level folder will only affect that particular series. Click on Edit – Correct at the top of the patient browser. Modify any needed information. Put the name of the modifier in the field marked “meduser”, then click OK.

Refer to User Manual for further information. Although the accuracy of the information is checked, it is neither a thorough nor complete discussion of a topic and should not be relied upon by the users for such information. This is not meant to be a substitute for the User Manual and the reader is referred to that document for the most comprehensive and complete information available on a topic.
CT ONLINE

What’s new @ www.siemens.com/Life?

❖ www.siemens.com/SOMATOMWorld
The newest online-feature are the User Lounges. Designed exclusively for SOMATOM CT users, membership has a number of benefits including access to the latest clinical cases, a discussion board, interactive web-based training, applications guides and more. They currently also offer all necessary information about up-coming syngo Evolve software upgrades. There are three User Lounges:
• SOMATOM Sensation User Lounge for SOMATOM Sensation and Volume Class users
• SOMATOM Emotion User Lounge for SOMATOM Emotion, Balance and Esprit users
• SOMATOM Smile User Lounge for SOMATOM Smile Users

❖ www.siemens.com/SOMATOMEducate
Anyone interested in new clinical applications will find a selection of comprehensive clinical information about syngo Colonography together with the new web-based interactive application training, plus information about how to get a free 90-day trial of a selection of clinical software. Siemens Computed Tomography also has got several new clinical training courses coming up including Advanced Applications. More information and on-line registration is available at the website.

❖ www.siemens.com/SOMATOMElevate
For anyone whose SOMATOM CT system is more than five years old, SOMATOM Elevate offers a managed system upgrade program. SOMATOM CT owners can also submit an analysis of their CT requirements.

The CT customer care team is looking forward to feedback and comments: med.SOMATOMWorld@siemens.com

Disclaimers
1 The syngo Evolve Package must be purchased as part of a Siemens Service contract. For more information about syngo Evolve, the local Siemens representative should be contacted.
2 In the event that hardware or software upgrades require FDA approval, Siemens cannot predict whether or when the FDA will issue its approval. Therefore, if regulatory clearance is obtained and it is applicable to this package, it will be made available according to the terms of this offer.
3 syngo Colonography is available for the Wizard console only. It is not available for SOMATOM Balance, Esprit, Esprit+, or Emotion CT systems.

Upcoming Events & Courses

<table>
<thead>
<tr>
<th>Title</th>
<th>Location</th>
<th>Short Description</th>
<th>Date</th>
<th>Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>22nd Annual CT/MRI Conference: Head to Toe</td>
<td>New York, USA</td>
<td>A three-part conference about Neuroradiology, Body Imaging and Cutting Edge Technology</td>
<td>December 15–20, 2003</td>
<td>New York University</td>
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<td><a href="http://www.radcme.med.nyu.edu">www.radcme.med.nyu.edu</a></td>
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<tr>
<td>ECR</td>
<td>Vienna, Austria</td>
<td>European Congress of Radiology</td>
<td>March 5–9, 2004</td>
<td><a href="http://www.ecr.org">www.ecr.org</a></td>
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<tr>
<td>syngo/CT Basic Course, german</td>
<td>Erlangen, Germany</td>
<td>syngo-CT Basiskurs für das grundlegende Verständnis der Bedienoberfläche syngo und physikalische Grundlagen der CT für deren optimalen Einsatz.</td>
<td>Ongoing/ regelmäßig</td>
<td>Siemens Medical Solutions Landesleitung Deutschland Computertomografie Tel. +49 9191 18 8141</td>
</tr>
<tr>
<td>Advanced Applications</td>
<td>Cary, USA</td>
<td>An exciting and challenging class for both physicians and technologists on 3D post-processing and CT clinical options.</td>
<td>Ongoing</td>
<td>Siemens Training and Development Center <a href="http://www.siemens.com/SOMATOM">www.siemens.com/SOMATOM</a> Educate</td>
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<tr>
<td>syngo/CT Basic Course</td>
<td>Cary, USA</td>
<td>CT technologist course introducing the basic principles of CT and the common Siemens medical user interface, syngo.</td>
<td>Ongoing</td>
<td>Siemens Training and Development Center <a href="http://www.siemens.com/SOMATOM">www.siemens.com/SOMATOM</a> Educate</td>
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<tr>
<td>CME Courses</td>
<td>Johns Hopkins University, USA</td>
<td>CME courses with focus on Multi-detector CT Scanning and Post Processing</td>
<td>Regular events, please see website</td>
<td><a href="http://www.ctisus.com">www.ctisus.com</a></td>
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In addition, you will always find the latest CT courses offered by Siemens Medical Solutions at www.siemens.com/SOMATOMEducate.
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