Direct Line to System or Data

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Associate Professor Anders Persson, MD, Director of the Center of Medical Image Science Visualization (CMIV), Linköping University Hospital, Sweden, appreciates the improved workflow with *syngo* WebSpace.

Direct Line to System or Data

Two modern remote solutions can display 3D/4D information not only at a workstation but also at other accesspoints within a hospital network. One tool even allows access beyond the hospital. Experts from Germany and Sweden report how these solutions have improved the quality of diagnoses and treatments as well as optimized their workflows.

By Katja Stöcker, MA

"Let's take a closer look at the vessels," says Bernd Wintersperger, MD, Associate Professor of Radiology and cardiac imaging expert at the Department of Clinical Radiology of the University of Munich Hospital (Großhadern Campus), Germany. At the 12th International Magnetic Resonance Imaging (MRI) Symposium in Garmisch-Partenkirchen in Germany, Bernd Wintersperger takes over the mouse control and does this demonstration scan via online access from a regular computer at the speaker's podium. His audience intently observes the screen.

Patient in Munich, Scan Control at Symposium

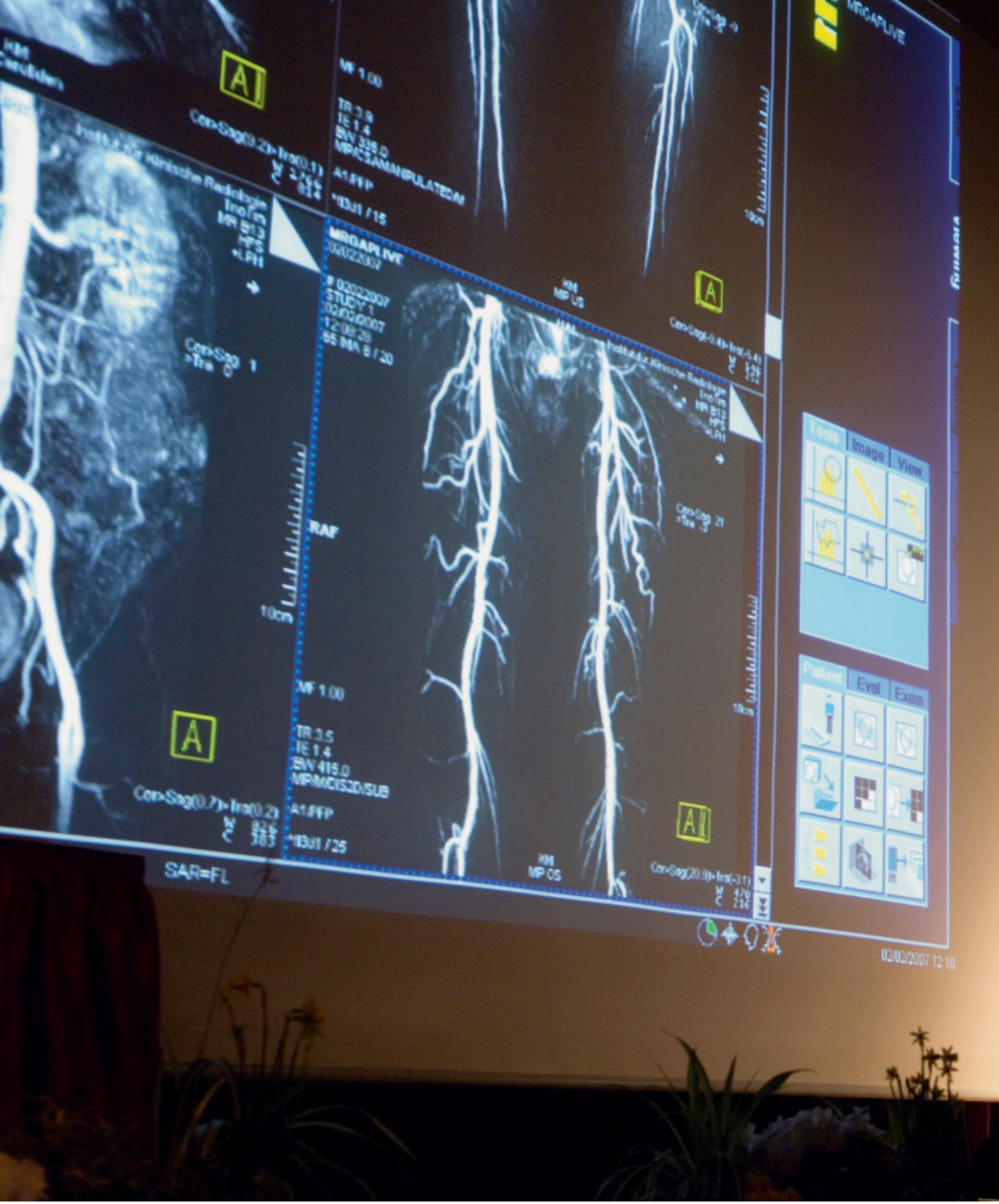
The 41-year-old patient is beeing scanned in the MAGNETOM® Trio MRI system in Munich. Cardiac expert Wintersperger starts scanning right from the Garmisch-Partenkirchen conference room. *syngo*® Expert-i is for use only within the hospital enterprise, but for this demonstration, a secure broadband virtual private network (VPN) connection to the hospital network was made possible at the symposium. The images show that the diabetic (type 1) patient demonstrates significant vascular changes, but no evidence of myocardial infarction. This presentation was made possible by *syngo* Expert-i, the unique application available for Siemens MRI and CT (computed tomography) systems. Wintersperger calls the application "very impressive," and the audience follows the live scan enthusiastically.

Apart from complex demonstration scans like the one at this symposium, the application has proven itself in clinical use. "For example, when younger colleagues have a question for experienced colleagues regarding a special examination, the experienced team members do not have to go to the MRI system," explains Bernd Wintersperger. The experts can connect to the MR with a one-time password within the hospital network. Then they can consult and perform the scan. Access is possible from a computer or laptop*, the

* Computer/laptop must meet minimum requirements.

"Using *syngo* WebSpace, we can call up thin-slice CT images from a standard computer or laptop. This provides us with a completely different way of working."

Anders Persson, MD,
Associate Professor and Director,
Center of Medical Image Science Visualization (CMIV), Linköping University Hospital, Sweden



Bernd Wintersperger, MD, Associate Professor of Radiology and cardiac imaging expert at the Department of Clinical Radiology of the University of Munich Hospital (Großhadern Campus), Germany, explains the possibilities of *syngo* Expert-i at the 12th MRI Symposium in Garmisch-Partenkirchen, Germany.

console of a picture archiving and communication system (PACS), or from any other MRI system within the hospital network.

Certain Diagnosis and Improved Workflow

According to Wintersperger, the application has proven itself in larger radiology departments where individual imaging systems are not located in the immediate vicinity. "*syngo* Expert-i not only enables a more confident diagnosis through a second opinion, it also helps to improve workflow," says Wintersperger, naming two decisive advantages.
The cardiac expert can also imagine that remote solutions such as *syngo* Expert-i could optimize cooperation among the various locations of a hospital. "In case patients are being scanned at the city campus of the hospital while dedicated radiology specialists are located at the Großhadern campus, the city campus colleagues can obtain a second opinion for particular cases," explains Wintersperger. Of course, this would also work the other way around. As a result, the patient does not have to be transferred to Großhadern. "*syngo* Expert-i can help to save time when performing special examinations, increase patient throughput, and allow for secure diagnoses," summarizes Wintersperger. In short, *syngo* Expert-i helps to optimize radiology workflow.

CT Thin-slice Data on the Office Computer

Some 1,400 kilometers away from Wintersperger, Associate Professor Anders Persson, MD, also gets excited when he hears the phrase remote access. In contrast to his colleague in Munich, the Director of the Center of Medical Image Science Visualization (CMIV) at Linköping University Hospital in Sweden is thinking more along the lines of transferring 3D/4D image data directly from a CT scanner to a computer, laptop*, or PACS.
Persson's hospital colleagues, for example, in vascular surgery, have access to the same detailed data as at a workstation, but can remain in their offices or conference rooms.
Previously, Persson discussed radiological findings with the vascular surgeons at

* Computer/laptop must meet minimum requirements.

Summary

Challenge:
- Uncertainty during an exam
- Live scans at conferences and training courses
- Handling detailed data beyond the radiology department
- Improved planning for interventions

Solution:
***syngo* Expert-i**
- Online access to MR/CT scanners from a computer or laptop*, for example in a conference room in the hospital

***syngo* WebSpace**
- Availability of 2D/3D/4D data beyond the CT and MR workstation
- Access via computer or laptop, even outside the facility

Result:
***syngo* Expert-i**
- Get a second opinion in seconds, for example, for special exams
- Shorter scan times and fewer repeated transfers
- Improved workflow across multiple locations within the hospital network
- Reduced training efforts

***syngo* WebSpace**
- Short-term storage of comprehensive thin-slice CT images
- Precise planning of surgical procedures and interventions
- Improved diagnoses and advice to patients

Further Information
www.siemens.com/syngo-Expert-i
www.siemens.com/syngo-WebSpace

morning case meetings using 2D images from PACS. "In order to plan operations better, surgeons want to see what we see, and not simply imagine it," explains Persson. This is now possible – any time, and from anywhere. "Using *syngo* WebSpace, we can call up 3D CT images from a computer or laptop*.** This provides us with a completely different way of working," says Persson enthusiastically. The easy, password-protected Internet connection to the *syngo* WebSpace server enables up to 20 users to work simultaneously with 3D/4D postprocessing tools, without having to sit at a workstation. The images are sent directly from the CT system to the *syngo* WebSpace server. "This happens much faster than from a CT system to PACS," reports Persson. Speed plays an increasingly important role in modern medical care, according to the Swedish Associate Professor.

Intensive Cooperation: Research and Application

The CMIV, founded in 2003 as an interdisciplinary research center, has to do business like a private facility, despite its association with the University Hospital, and has to send monthly reports to the hospital management. "An improved workflow and intensive cooperation with clinical colleagues are extremely important to our efficient research and development projects," says Persson, describing two fundamental challenges to the CMIV. The research activities of the 70 researchers and 31 doctoral candidates focus on the big picture. Persson and his team are researching imaging and reconstruction, image analysis, visualization, and processing, as well as transferring of comprehensive image data; such as that generated with the high-end SOMATOM® Definition Dual Source CT system. The CMIV master plan is displayed the wall: a Nobel Prize within the next 25 years. Their view extends beyond the doors of the CMIV to the adjacent floors of the University Hospital: The requirements and feedback from clinicians flow directly into CMIV research. In return, the CMIV radiologists, using *syngo* WebSpace client-server technology, forward thin-slice 3D/4D CT images from the CT system directly to vascular surgeons such as Claes Forssell, MD. He says: "We need, for example, very precise details regarding the position, length, and extent of aneurysms, aneurysm necks, and access vessels. The ability to look at 3D/4D images, even in my office or during surgery, simplifies my work and improves treatment for my patients."
syngo WebSpace is also the optimal solution for short-term storage of thin-slice CT data (less than five millimeters). Depending on the configuration, from 1.6 to almost 10 million thin-slice acquisitions can be stored on the *syngo* WebSpace server. The need for 3D/4D image data from volume CT images has grown enormously, but purchasing new or upgrading existing workstations is expensive. CMIV employees currently work at four workstations. "Naturally, they are always fully booked," says Persson. "*syngo* WebSpace makes detailed CT information available everywhere, although password protected, and significantly improves workflow." This saves money and improves the quality of treatment.

Better Advice for Patients Thanks to 3D/4D Acquisitions

Thoracic radiologist and senior physician Gunnar Wiklund, MD, notes an additional benefit: "If a patient sees how advanced the calcification is in his or her coronary vessels, he will take our advice to quit smoking and get exercise more seriously than if we were to tell him or her and show him or her 2D images from PACS." For Associate Professor Persson of CMIV, *syngo* WebSpace also plays a critical role in training: "Here in the CMIV training room, I show my students the 3D/4D images from the computer directly on the screen." Persson also trains colleagues from throughout Sweden about working with 3D/4D postprocessing tools such as *syngo* InSpace4D, and shows them how to design more efficient workflows with *syngo* WebSpace. The next course will take place in early 2008.

Virtual Autopsies Clarify Criminal Cases

One focus of the CMIV is cardiac examinations. The Dual Source SOMATOM Definition CT system provides Persson and

* Computer/laptop must meet minimum requirements.
** Internet connection needed.

his colleagues with high-resolution, real-time images of the beating heart, using a low dose of contrast agent and no beta blockers. Because of its modern equipment, the CMIV also works on solving criminal cases. According to Persson, since the center's founding in 2003, it has performed almost 200 virtual autopsies. "In some of the cases, with our modern imaging capabilities, we came up with a different cause of death than the obvious one," reports Persson proudly. High-resolution, 3D imaging provides fast, precise information on injuries and fractures. Using *syngo* WebSpace, the information is sent just as quickly to the corresponding police stations and district attorneys' offices.

Remote: Beneficial Tools for Interaction

Persson and Wintersperger see remote solutions such as *syngo* Expert-i or *syngo* WebSpace as beneficial tools for improved interaction among experts. Both offer a more secure diagnosis in order to improve

treatments. Above all, cooperation and workflow both within radiology as well as with other hospital departments can be optimized.

Katja Stöcker *works in the editorial office of* Medical Solutions. *Prior to this, she was a freelance writer for* Deutsche Presse-Agentur (dpa) *(German Press Agency), various daily newspapers, and the online editorial office of the broadcast station* Mitteldeutscher Rundfunk (mdr).

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Bernd Wintersperger, MD,
Associate Professor of Radiology,
Department of Clinical Radiology,
University of Munich Hospital
(Großhadern Campus), Germany

Siemens improves the workflow in radiology and beyond with the two remote solutions *syngo* WebSpace and *syngo* Expert-i.