

Top System Down Under

Well aware of its responsibility for offering the highest quality healthcare to both urban and rural residents in remote Western Australia, Royal Perth Hospital has depended on Siemens for more than 13 years to support the continuous expansion and improvement of its facilities with the latest equipment and technology. The latest addition to its arsenal: the *syngo* Dynamics system – the largest installation of its kind on the island nation.

By Garry Barker

Australia's first-ever implementation of Siemens' *syngo*® Dynamics system is now in operation at Royal Perth Hospital in Western Australia, after an installation that engineers on the site describe as flawless.

"Since installation, our unscheduled downtime has been zero," says Michael Lovett, Senior Clinical Engineer for Biomedical Systems at the hospital. Scheduled maintenance, overseen by Siemens' engineers in Germany, who are connected to Royal Perth via the Internet, has also gone according to plan. He praises the Siemens online monitoring system, saying that when an error message appeared recently, he found when he called the Siemens call center, it not only had noted the message, but had already ordered the necessary replacement part. "It did not stop the system; it was just showing the error, but they were right on it." *syngo* Dynamics is Siemens' innovative, multimodality, dynamic image review, processing, and archiving system for improving efficiency and accuracy in cardiac and general medical imaging. And

in Perth, everyone involved is smiling, not only about the system as it is now, but also about the headroom it offers for further expansion of Royal Perth's imaging services.

A Lifeline Thousands of Miles from Everywhere

Royal Perth Hospital's cardiac unit is regarded as one of the best in Australia – at the leading edge of technical and medical development. Along with the new *syngo* Dynamics installation, three Siemens' cardiac labs using Artis zee® imaging units and two AXIOM® Sensis haemodynamic integrations were added, making this installation the largest in Australia and the largest in the Asia-Pacific area.

But consider for a moment this hospital's location. Australia is the largest island continent in the world, at 7.7 million square kilometers (three million square miles), as large as the continental United States. Western Australia covers more than 2.5 million square kilometers (one million square miles) – four times larger

than the U.S. state of Texas – almost all of it hard, dry, remote, uninhabited, not to mention rich beyond imagination because of the iron ore and other minerals buried under its dusty red surface. Perth is a modern and, because of the mining boom, a prosperous, comfortable, well-equipped city set on the banks of the Swan River, enjoying a balmy Mediterranean-style climate. But it's a long way to anywhere else – 2,720 kilometers (1,690 miles) as the crow flies to Melbourne in the east, and 3,903 kilometers (2,425 miles) to Singapore – which is one of the reasons hospitals such as Royal Perth insist on top-quality, reliable equipment.





Three cardiac labs are equipped with Siemens' technology in addition to the cardiology IT solution *syngo Dynamics*.

What you might call the catchment area of the hospital also includes the huge mining operations in the Pilbara. The mining companies maintain skilled medical staff, but for more complicated cases, they look to Perth. So do people living in remote settlements and on the many outback stations, as the huge farms – some larger than small European countries – are called in Western Australia. For them, the Royal Perth Hospital is a lifeline accessible by the Royal Flying Doctor Service's turboprop ambulance aircraft and helicopters. All of this, and the bustling populations of Perth and nearby cities of Western

Australia's Southwest, is always top of mind for the three men from Royal Perth's cardiac team most involved with the new *syngo Dynamics* installation, who are happy to talk about how it was done and why. They are Michael Lovett in the Department of Medical Engineering and Physics; Stephen Collett, Chief Cardiac Technologist; and Jamie Rankin, MD, Head of the Department of Cardiology.

The Implementation Team Speaks Out

Royal Perth also carried out an important upgrade of the *syngo Dynamics* system software from version 7 to the latest ver-

sion 8 in April 2010. This lasted about eight hours, was monitored online by Siemens' technicians in Germany and the U.S., and, complex though it was, went very smoothly. Now that upgrade is bringing the cardiac unit at Royal Perth significant productivity improvements plus the eagerly sought opportunity to establish secure Web-based access to patient records inside (and soon, outside) the hospital via the Internet. The Web-based *syngo Dynamics* Portal will employ a new fast-delivery method based on Microsoft's Silverlight® technology. This will allow images and data to be transmitted to other hospitals

“The result is increased productivity and time savings – and that’s a good thing.”

Jamie Rankin, MD,
Head of the Department of Cardiology,
Royal Perth Hospital, Perth, Australia



around Perth, to specialists in their consulting rooms offsite, and, potentially, to anywhere in the world they might be needed.

Lovett was the principal architect in preparing the specifications for the tender, which Siemens won in a competitive tender process with four other leading suppliers. “Version 8 takes us to a new platform,” he says. “The next upgrade, to version 9¹, will incorporate offsite reporting, and that will be very valuable for us. That’s where we are heading. We are not stopping development; we are continually expanding our capabilities and the use of the technology.”

All three of these men at the center of the *syngo* implementation speak warmly of the partnership they and the hospital have had with Siemens for over a decade – a partnership that shows every sign of continuing well into the future. “We are a team,” they say. It has been a long and – to judge from comments by both hospital and Siemens’ staffers – successful professional relationship.

¹ *syngo* Dynamics version 9.0 is pending 510(k) review and is not yet commercially available.

One example of that cooperation involves the migration of ten-year-old information held in the hospital’s previous ACOM analog system to the new high-capacity digital system. “Say we had been searching among the 650-odd laserdiscs we previously used for storage, or among the stacks of DVDs we also used, for someone called John Smith or J. Smith,” says Lovett. “There were a lot of them, but we had to be sure which record belonged to which patient. So we sent all the data to Siemens and they analyzed all the areas that were an issue. Now, the data sets are unique.”

The considerable task involves the records of as many as 20,000 angioplasty patients and many thousand more angiograms. Ewan Layton, one of the Siemens executives closely involved with the implementation, says that Siemens analyzed about five terabytes of data as a service to the hospital.

The Importance of Imaging in Cardiac Patients

Clearly, the hospital as well as the medical and technical teams working in the three new Siemens cardiac labs are proud of and enthusiastic about their new

facility and its benefits. Imaging is a vital component of cardiac surgery, and the ability to find, accurately identify, and quickly produce the images is critically important to an operation's success. "In moving to *syngo* Dynamics, we were seeking a one-stop solution," says Collett. "We wanted a solution that could be integrated into our physiological monitoring, that along with our digital X-ray imaging, could be connected to our picture archiving system so we could call up CT [computed tomography] and chest X-ray images, and that would be able to store and retrieve everything easily."

"Everything" means that the thousands of images associated with every patient treated since 1999 are now online and available to technicians, clinicians, and surgeons throughout the hospital communications network within seconds. "We do about 1,000 angioplasties a year at Royal Perth," says Rankin. "About 200 of those are for patients who are having acute heart attacks. On top of that, we do about 3,000 angiograms a year." And increasingly now, Rankin notes, Royal Perth surgeons are doing other things such as valve replacement and procedures to reduce the risk of stroke and structural heart interventions. These are often complicated, and Rankin says the imaging system that is now available is extremely useful – in many cases also reducing procedural times.

Rankin is impressed with other timesaving aspects of the new *syngo* Dynamics system as well. "It has given us a dramatic improvement in terms of being able to call up images and old studies from years gone by," he says. "It's now possible for us to retrieve images from ten years ago and do it within seconds, so that we can compare what was with what is now. In the past, you would have to find the laserdisc and load it up. You had to go off and do something else while you waited, perhaps half an hour or more, for the data you needed."

Improved Accessibility, Accuracy, and Security

Images are now stored on a 17-terabyte archive. "Now, you can get the images up in the lab immediately, so you can look

at all of the previous studies and compare them onscreen, side by side. The result is increased productivity and time savings – and that's a good thing," explains Rankin.

That is seen as the principal gain provided by *syngo* Dynamics, but other benefits in practice have also been gained. One of these is accuracy and the other, security. Because all data is now stored centrally and digitally, human mistakes in typing or retyping patient information are reduced to virtually nil. Security of the information is also greatly improved. "With this system, the data is controlled. Paper and discs are much more difficult to control," says Collett.

syngo Dynamics also allows physicians to pull in CT scans and, potentially, ultrasound images, and link these with electro-mechanical mapping systems. "That has

"We wanted a solution that would be able to store and retrieve everything easily."

Stephen Collett, Chief Cardiac Technologist
Royal Perth Hospital, Perth, Australia



Summary

Challenge:

- Bringing cardiac imaging management at Royal Perth Hospital into the 21st century and design a road map for the future
- Building a new digital storage system to accommodate images from the previous system and digitizing and collating legacy images from 650 laserdiscs, including images archived from other resources over the past 20 years
- Providing a pathway for integration of other hospital and patient information and records into the cardiac unit

Solution:

- Installation of *syngo* Dynamics system, version 8, to be available in three cath labs to draw in patient demographics on demand
- Capacity to pull in CT images and develop Web-based distribution, initially throughout the cardiac department and hospital, but ultimately offsite via the Internet
- Detailed analysis of five terabytes of archived records to check the accuracy of patient data

Result:

- Complete satisfaction of *syngo* Dynamics with senior technical and medical staff
- Establishment of a road map for further development, including upgrade to forthcoming version 9 of *syngo* Dynamics
- Seamless switchover to the new system without interruption to cardiac unit schedules
- Unscheduled downtime reduced to zero since implementation²
- Records dating back to 1990 becoming instantly available to workstations throughout the cardiac unit and the wider hospital network

been a revolution on the EP [electro-physiology] side," he says. "The combined imaging of various modalities in the lab as they are doing the procedures has reduced the screening time in EP."

As part of the *syngo* Dynamics acquisition, Royal Perth bought a worklist broker system called Magic Link A. "We synchronized that into the cardiobase, which is the cardiology information system where patients get booked in," says Collett. "The information goes to the worklist, and that goes downstream to all our modalities. There is now a single point of entry for the booking and that has brought major improvement to our workflow."

With Magic Link A, staff can consult the scheduler, select the patient's name, and all their demographics are populated into the system in all areas of the department. "Our patient demographics are very tight now, and we can register a patient very quickly," says Collett.

Beyond that, and clearly within Royal Perth's sights, is even wider integration of patient records and use of the Inter-

net in a secure situation to make them available, instantly to wherever they are needed.

"Royal Perth has a vision," says Siemens' Layton. "They want to expand the capabilities of the system. During the years that we have been working with Royal Perth Hospital, we have had an evolution in technology, and we have not left them behind. We have migrated everything through [to *syngo* Dynamics], and we have a future road map to get these guys to where they need to go."

Garry Barker is technology editor of The Age newspaper in Melbourne, Australia. Prior to joining that publication, he was a foreign correspondent and war correspondent working in the USA, Southeast Asia, and Europe, based in London.

Further Information

www.siemens.com/syngo-dynamics

"Since installation, our unscheduled downtime has been zero. We are continually expanding our capabilities and the use of the technology."

Michael Lovett,
Senior Clinical Engineer for
Biomedical Systems,
Royal Perth Hospital, Perth, Australia



² Results may vary. Data on file.