



Every picture tells a story

Xcelera makes storing, accessing, comparing and sharing images a whole lot easier at this hospital in Finland

Who/where

Cardiology department,
Tampereen yliopistollinen sairaala
(Tampere University Hospital)
Tampere, Finland
Dr. Vesa Virtanen,
head of cardiology clinic
Dr. Tuija Poutanen, pediatric cardiologist

Challenge

Streamlining the way in which cardiologists, pediatricians, obstetricians, anesthesiologists and cardiac surgeons work with images generated using various modalities within the cardiology department.

Solution

The installation of the Xcelera multi-modality image management system release 2.2, including dedicated workstations and additional access through the hospital's intranet.



Dr. Poutanen (specialist doctor)

Multi-vendor compatibility

In April 2008 the Tampere University Hospital became one of the first healthcare facilities to install the release of Xcelera R2.1. Inevitably, as with all new software releases, there were certain teething problems to take care of, but these were solved through close cooperation with the hospital staff and also with the subsequent installation of release 2.2 in September. "It works fine with imaging equipment from many different vendors, not just Philips," says pediatric cardiologist Dr. Tuija Poutanen.

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The University Hospital is one of two hospitals in the Finnish city of Tampere, which together serve a region of 470,000 inhabitants. The University Hospital's heart centre has 60 beds for cardiology patients as well as 24 intended for those undergoing cardiac surgery. There are five Cath labs, including a dedicated

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electrophysiology (EP) lab, and four operating rooms. The 300 staff includes 20 cardiologists, 15 surgeons and eight anesthetists. Together they treat a total of 15,000 patients each year. This includes approximately 1000 cases of myocardial infarction (heart attacks), inserting 500 pacemakers, making 3000 coronary angiograms and 1000 PCIs (percutaneous coronary interventions, also known as coronary angioplasty). There are also around 1000 open-heart operations. It is one of five university hospitals in Finland, all of which have a dedicated cardiology department.

“Before I came to Tampere I worked in the pediatric cardiology department of a hospital in Helsinki,” says Dr. Poutanen. “I used Xcelera there, I was familiar with it, and I was impressed. I wanted to have it here as well.” Her fellow pediatric cardiologist Dr. Anneli Eerola, who had also had experience of Xcelera in Helsinki, was of the same opinion. Meanwhile Dr. Vesa Virtanen, head of the cardiology clinic, independently came to the same conclusion. “We had a few options, but my preference was also for Xcelera,” he said.

Single, integrated archive

What was behind their choice? “For me the main reason was that we would have a single, integrated archive for angio, echo and other relevant images,” continues Dr. Poutanen. Dr. Virtanen nods in agreement. “Before, every Cath lab imaging system or echo lab ultrasound unit had its own workstation, where the pictures were stored on the local hard disk. Images from these and other modalities were also transferred to tape, CD or DVD and stored in a central archive.

If you wanted to look at one of these images as reference, you had to do so on the machine it was made on, or go to the archive and find it there. This could take a long, long time, especially if it was stored on videotape, because often you had to watch a lot of other footage before discovering what you were looking for.”

“It makes things so much more efficient.”

Now that is no longer necessary, because everything is sent to and stored in Xcelera. “You have all cardiac data in one location,” he continues. “Wherever you are in the hospital, you just go to the nearest Xcelera workstation and call up the images you need. It makes things so much more efficient.” Dr. Poutanen is also impressed by the level of convenience. “There are images from both echo and x-ray, as well as other modalities like cardiac CT and MRI,” she adds. “If a patient underwent an MRI scan two years ago you could call up the results in seconds, even though it was made using a different modality in another part of the hospital.”

Being able to compare images side-by-side was cited by both as another major benefit. “When I have a difficult case I look at the archive pictures before I see the patient, which makes it easier to know what to look for and what to focus on,” says Dr. Poutanen. “Prior to Xcelera I never really did that because I simply didn't have enough time to track down the old images.” Instead she just consulted written reports, which meant that the information was more difficult to digest.

“Now, you can look at images of the current and previous situation alongside each other, so it becomes much clearer what has changed,” she continues. “The Xcelera workstations have two screens, which is very convenient. You can show the patient list on one and the images and reports on the other.”

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Time savings

There are also savings in time. The distance between the Cath labs and the cardiology wards and offices in the Tampere University Hospital is about 500 m, with a lot of stairs in between. “It was quite time consuming to go to the Cath lab to view an image or consult with a colleague and then come all the way back again,” says Dr. Virtanen. “Now it's possible to look at echoes and angiograms where the patient is, in the ward, using Xcelera. And you can also consult with doctors and specialists elsewhere in the hospital and ask them to view the same images and documents simultaneously so we can discuss things. That increases efficiency for many different types of specialist. Anesthetists, obstetricians, cardiologists, pediatricians and cardiac surgeons all benefit from this.”

“Now it's possible to look at echoes and angiograms where the patient is, in the ward, using Xcelera.”

“In Xcelera you can compare reports as well,” says Dr. Virtanen. “All patient records are available in the database, and there it is much easier to search for specific information using, for instance, examination dates or by patient name. It also allows you to view data like left ventricle measurements in graphical form, which brings it to life more than just seeing a series of figures.”

Automation of z-score analysis

Another of the features Poutanen values on the Xcelera is the pediatric z-score, which gives the standard deviation from normal values associated with heart measurements. “I often have to determine whether the size of a child's heart is normal or abnormal,” she says. “We treat patients ranging from newborn babies and even fetuses inside the womb to children who are the same size as adults. It is therefore essential that we have reference values to compare our measurements against.”

She takes a folded piece of paper from a plastic wallet in her pocket and opens it up to reveal several small graphs side-by-side. Each one shows the upper and lower limit plus average for parameters like body surface area or left ventricle size. “This is what I used to use for reference,” she says with a smile. “All this data is now included in Xcelera, and I really appreciate that. When I carry out measurements it automatically tells me whether they are within the indicated limits. The fact that the reference values are average readings based on large patient populations is also a benefit.”



Dr. Poutanen (specialist doctor) and Dr. Virtanen (chief physician)

The z-score also helps in analyzing trends, so by analyzing a series of measurements you can gauge whether medication or an operation has had the desired effect.

Better patient care

Although patients wouldn't necessarily be aware that a hospital like the one in Tampere had installed an Xcelera system, they would, according to Virtanen, benefit nonetheless. “We can provide better care because we can compare studies more effectively and work more efficiently. The waiting time for patients is also shorter because we can make decisions quicker. Rather than having to find and compare images from the old physical archive, we can have the results instantly.”

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The intuitive nature of the system was another plus point. “When I first used Xcelera in the Helsinki hospital I didn't really think about it much, I just started,” says Dr. Poutanen. “No one really showed me anything. It was quite self-explanatory.” however, that doesn't mean there is no need for training. “Although you can get going on your own, there are so many possibilities and functions that you can't discover them all by yourself. We therefore had several days training to allow us to really get the best out of it.”

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There are currently 20 dedicated Xcelera workstations in Tampere; 16 for general cardiology, three for pediatrics and one for obstetrics. On top of this, up to 50 people can simultaneously access the data using Xcelera WebForum.

This allows them to view images and reports for discussion and reference, but excludes the additional functionality available on Xcelera such as measurement, calculation, analysis and reporting.

The operating rooms have Xcelera workstations. "For surgeons carrying out bypass surgery this makes a big difference," says Dr. Virtanen. "Some patients have fat surrounding their heart, which can make it difficult to pinpoint the coronary branches. Before, surgeons would have to remember the positioning of the branches before they went into the OR to carry out the procedure. Now they can view angiograms on the Xcelera workstation (in the control room) as they work."

"For surgeons carrying out bypass surgery this makes a big difference."

It is also present in the intensive care department of the neonatal lab. "Ultrasound images we make there have to be really accurate because sometimes we are carrying out measurements on tiny babies who don't weigh much more than 1 kg," says Dr. Poutanen. "We use a Philips iE33 ultrasound cart for this. I am often asked to check these images from another location through Xcelera." When 3-D echoes are carried out using the iE33 it is possible to do 3-D analysis either on- or off-cart (i.e. in Xcelera). This also applies to other ultrasound equipment.

Remote implementation and configuration

Interestingly, the majority of implementation and configuration was carried out remotely from the Netherlands, which helped minimize any disruption. The upgrade to 2.2 was completed via the same network.

The hospital also runs Xcelera Connect which enables communication to other hospital systems. It is also worth noting that the Xcelera server is not located in the hospital, but in a large, underground IT room safely located approximately 6 km from the hospital itself.

Looking ahead, there is talk of linking the Xcelera systems in Tampere and Helsinki. "In Tampere we have a pediatric outpatient clinic, so we only carry out diagnostics and follow-up," says Dr. Poutanen. "If we have a child that has to be operated on, he or she is transferred to Helsinki. It would be great if we could exchange information between the two sites faster." Another option could be enabling access to the Xcelera system from outside the hospital, so for instance doctors on call could consult images and already initiate procedures before they left home. But, for the time being, the staff at the Tampere University Hospital are just content with the improvements that Xcelera has already brought.

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www.philips.com/healthcare
healthcare@philips.com
fax: +31 40 27 64 887

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Philips Healthcare
Global Information Center
P.O. Box 1286
5602 BG Eindhoven
The Netherlands