

Taking the Initiative

WHO/WHERE

Hospital of the Sisters of Charity

Linz, Austria

750 bed, secondary level hospital.

The Cardiology Department provides the full range of invasive and non-invasive cardiac diagnosis. Of the more than 4,500 patients a year, approximately 1,500 undergo angiographies, of which 600 are treated with PCIs.

Cardiology Department:

Univ.-Prof. Dr. Peter Siostrzonek, Head of Department

Senior Physician Dr. Horst Kratzer, Head of the Cardiac Catheterization

Laboratory

Senior Physician Dr. Martin Gattermeier

Radiographer, Mrs. Maria Penz



The Hospital of the Sisters of Charity, Linz, Austria

Integrated cardiac catheterization environment in the Hospital of the Sisters of Charity, Linz

The Hospital of the Sisters of Charity (Krankenhaus der Barmherzigen Schwestern) in Linz, Austria, has always had a pioneering spirit. In 1975, it was the first in the country, outside of the university hospitals, to plan a department of internal medicine with a cardiological focus. Now, almost 30 years later the cardiology department, headed by Univ. Prof. Dr. Peter Siostrzonek, has moved to the latest generation of catheterization lab equipment, and has become the first in Austria to have a fully integrated Philips cath lab environment. This means that the X-ray equipment, hemodynamic workplace, Cardiovascular Information System (CVIS) and Picture Archiving and Communications Systems (PACS) all communicate with each other, and with the other systems in the hospital, to support faster and easier workflows.

A patient's arrival in the cath lab starts by entering their data in the CVIS. The CVIS shares this patient information with the Philips PACS, to index the images. An interface to the Hospital Information System (HIS) has been implemented to pull patient demographic data from the central system into the CVIS. (The HIS side of this interface will be completed as part of a forthcoming update of the HIS). During the procedure, the radiographer uses the CVIS to log consumables, procedural events, duration and radiation. At the end of the procedure, the X-ray images are transferred to the PACS and the cardiologist compiles the report by selecting and editing the appropriate text blocks from the CVIS database, using an integrated viewer to consult the images from the PACS.

CHALLENGE

Integrating angiography, hemodynamics, reporting and picture archiving and access in the catheterization laboratory.

SOLUTION

Inturis Suite PACS (connected to ADIC tape archive and third-party web distribution system); Philips Intellis Allura 9C C-arm; Schwarzer cardis 5000 hemodynamic registration and evaluation system; Schwarzer cardioBase hemodynamic data management system; Philips Professional Services•



Senior Physician Dr. Martin Gattermeier

Finally, the finished report is published on the HIS, where it is available to authorized users throughout the hospital – the HIS provides a central repository for patient data, which also includes laboratory data, patient history, and radiology reports. Radiology and cardiology images are not yet distributed electronically because, as Senior Consultant Dr. Horst Kratzer, head of the cardiac catheterization lab, indicates, this does not have as high a priority as access to the reports.

“I must say that it really does work very well”

Forward Thinking

Though cardiac catheterization in the hospital has historically used Philips equipment, it was not an automatic conclusion that the recent upgrade would stay with Philips. The decision took a long time, and a lot of deliberation. Apart from the team from the cath lab, the opinions of other members of the cardiology department, the hospital management, and the IT department were important. This provided the clinical, economic, and technical background for the decision. Mr. Kramer, head of the hospital’s Technical Department, collected, correlated and recorded the arguments for and against the different systems they were considering, in what Dr. Kratzer describes as “an optimal preparation” for the final decision.

They were interested in a flat detector, though this was not available from Philips at the time. But being dependent on their single X-ray system, they were reluctant to buy relatively new flat detector

technology from a company with which they had no experience. Another big question was whether a PACS could interface and transfer images to the established web distribution system provided by the Radiology Department.

“For overall angiography concept, Philips had the best thought through solution”

Dr. Kratzer explains, “one cannot decide for a system based on a single aspect, one has to look at all the issues. And for overall angiography concept, Philips had the best thought through solution”. What the Philips angiography solution, the Integris Allura, particularly had in its favor was its X-ray tube, with its significantly better utilization of the X-rays, so that “even without the flat detector, the Philips image was relatively good”, as Dr. Kratzer puts it. It was also available with a ceiling mount, to free up a space in the new cath lab. This space has proved particularly valuable for anesthesia equipment. The PACS, hemodynamic workstation and CVIS were all part of the package – which meant they worked together. Though the web distribution system is from another manufacturer, “Philips assured us that connecting to it was not a problem”, says Dr. Kratzer. Given their experience with Philips over the years, they trusted them. Dr. Kratzer now confirms, “I must say that it really does work very well”.

Finally, now that Philips offers a flat detector, they are planning a visit to a reference site in May 2003. Senior Consultant Dr. Martin Gattermeier, cardiac interventionist, and head of the cardiac echo unit, expects that this will boost the faster diagnoses and treatments that the new system has brought, by further increasing quality through better information for diagnoses.

Painless Installation

Dr. Kratzer was not in favor of closing the cath lab for the whole duration of the renovation. They organized with the other two cath labs in Linz to take over their responsibilities in this time, but because it involved building work, there would be a six-week gap in operation, and there was no guarantee that once patients had gone to another cath lab that they would return. Dr. Kratzer was pleasantly surprised that almost all their patients returned, and that non-emergency cases had even waited – meaning that the new system started with an overabundance of procedures!

“The system is easy to use and one doesn't need to be a specialist to get it to work, even in an emergency situation”

The installation itself ran more or less without the involvement of the cardiologists or cath lab staff. The plans and expectations were clear and agreed upon ahead of time. The team from Philips Professional Services prepared themselves optimally ahead of time by working closely with ADIC, the supplier of the tape-handling robot for the long-term archive, Siemens, who supplied the web distribution system in the Radiology department, and the IT department in the hospital, who supplied the computer hardware. Once the builders were done, they set to work installing the computers. This started with the operating system and installing the applications, and continued with configuring the PACS, interfacing the PACS to the X-ray system, the CVIS, the web distribution system and the tape robot. Finally they tested that the whole system worked. Altogether the integration took four days.

Ease of Use

Training was not a problem, as the consistency in the interface to the preceding Philips system meant most controls stayed the same, and the new features were easy to learn. Because the hospital handles emergency cardiac cases, the cath lab has to be operable at short notice, 24 hours a day. This means that the X-ray system is occasionally used without the help of a radiographer. Both Dr. Gattermeier and Prof. Siostrzonek were impressed that this was so simple. “It goes to show that the system is easy to use”, says Prof. Siostrzonek, “that one doesn't need to be a specialist to get it to work, even in an emergency situation”.



Mrs. Maria Penz, Radiographer

“Lots of things are easier, and therefore quicker”

As a regular user, the two major improvements that the radiographer, Mrs. Maria Penz, has noticed are the speed of the C-arm, and the possibility to save projections for re-use. This built-in repeatability helps eliminate the projection as a cause of discrepancies in images, making it quicker to locate the real source of the difference, such as patient position, respiration state, or catheter positioning. The swiveling table also helps increase the range of locations they can X-ray easily, and “the flexibility of the C-arm is extraordinarily good”, adds Dr. Gattermeier. So when they need images of the pelvis and leg, for

example, if there is a problem at the catheter introduction site, this is quick to do without compromising the patient's comfort. This flexibility is also valuable for the extreme angles and positions required for certain stenosis, "in this respect", says Dr. Gattermeier, "the Philips equipment is definitely superior to even biplane C-arm systems".

"Through the speed of the C-arm, the automation of the projections, and not having to wait on an overheated X-ray tube", says Dr. Kratzer, "the examinations are faster. Lots of things are easier, and therefore quicker." Dr. Gattermeier confirms that taken together, the Philips package saves time. This means that where they were dealing with five or six patients a day before, now it is eight or nine – which is how they have been able to cope with the increase in referrals from new sources.

"I have to say it is very practical, for both the doctor and the patient, to access the images so quickly"

Images on Call

Prof. Siostrzonek describes the PACS as playing a very important part, particularly because of the number of repeat visits a patient typically makes to a cardiology department. The PACS makes it easy to retrieve previous angiographies for preparing patient visits, and tracking and influencing the course of treatment – not just interventions, but also lifestyle and preventative measures. "The archive works very well", says Prof. Siostrzonek, "I have to say it is very practical, for both the doctor and the patient, to access the images so quickly, to see changes over time". Dr. Gattermeier adds that, apart from simplifying reporting through quick access, the stability of the Philips PACS "is definitely worth mentioning



Senior Physician Dr. Horst Kratzer

and praising", particularly when compared to anecdotes from colleagues in other hospitals. Before the new system, the cath lab images were all archived on CDs, which had to be burnt and archived manually. Even though this was a lot simpler and quicker than developing cine film at the end of each procedure, they knew it could be simpler still, or as Dr. Kratzer puts it: "being spoiled, we became more demanding". This is what prompted them to look at archive systems as part of renovating the cath lab, to eliminate even the time and effort taken to archive and retrieve CDs. Philips arranged a trip to the University Hospital in Ulm, which demonstrated a real system in operation under real circumstances.

"The stability of the Philips PACS is definitely worth mentioning and praising"

Today, older images and cine-runs are added from the CD archive to the PACS as required, when a patient returns or brings a CD from a referring doctor or hospital. Though the department still has its film viewing equipment and film archive, this data is too old to be relevant for current patients, so there is no plan for transferring it to the PACS

Links Outside

Apart from generating and assimilating information, the department prides itself on providing a service that uses information to help their patients appreciate their illness, understand the tests they undergo, and be conscious of the value of the treatment. As part of this, every patient is given still pictures of their angiographies and, on request, can have a CD of the cine-runs to play on their home computer. The CD automatically includes the application to play the sequences (Inturis Suite Light Viewer), which also makes it simple to provide the CD to referring doctors. Though access to the PACS in the department is currently limited to the cath lab and the departmental conference room, it is intended to extend access to the wards to provide immediate support for healthcare decisions, and further ease the communication with the patient.

“Overall we are more than satisfied with Philips”

In the future both Prof. Siostrzonek and Dr. Kratzer indicate that an online connection to the cardiac surgeons in the Linz General Hospital (AKH Linz) would be ideal. The cardiologists in the Hospital of the Sisters of Charity perform most percutaneous coronary interventions (PCIs) as an extension of the same angiography procedure that indicates the need for intervention. However, in some cases it is not possible to decide immediately between PCI and surgery. The cardiologists make these decisions during the weekly discussions with the AKH surgeon. A link for transferring images would mean they could tele-conference with the surgeon to make the decision during the diagnosis. This could save some patients a second visit and a second procedure. On the other hand, Prof. Siostrzonek stresses that the weekly

conferences would need to continue, to ensure the optimal exchange of patient and morphological information that happens in face-to-face meetings.

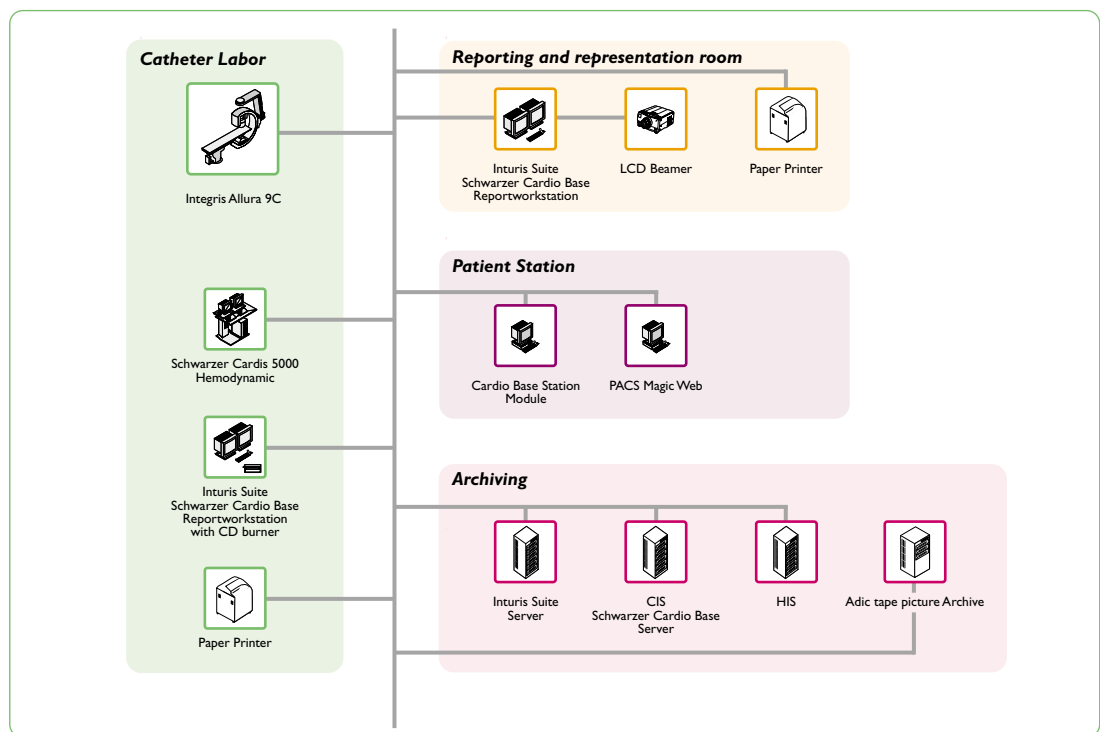
A link would also help deal with emergency cases. There are three principal cardiology departments in Linz, and they deal with emergencies on a daily rotation. Of course each department also has its own patients, referred from regional hospitals throughout the Mühlviertel (area of upper Austria) and from local specialists, and it does happen that a patient arrives as an emergency case in a different hospital than has the relevant records. Dr. Kratzer indicates that a project to connect the three departments together was started, but has been put on hold for the moment.



Univ.-Prof. Dr. Peter Siostrzonek,
Head of the Cardiology Department

Pioneering Spirit

Dr. Gattermeier confirms that “overall we are more than satisfied with Philips”. This satisfaction relies not just on continuing quality of Philips equipment, but also on the quality of integration and support services that turn that equipment into a working solution. With plans for equipment upgrades and further connectivity, Philips is helping them maintain their leading position among departments of their type throughout Austria.



Hospital of the Sisters of Charity - Cardiology



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