CASE STUDY

Solution at-a-glance

Company
Astrid Lindgren Children's Hospital

Industry
Medical

Employees
1,500

Storage application
Medical imaging data

StorageTek® solutions
9176 RAID disk storage system

Related solutions
Sectra (PACS provider)

Business results
- PACS system storage archive based on RAID technology
- Improved hospital efficiency
- More timely patient care
- Web-based image access

Astrid Lindgren Children's Hospital

Film-free for children's sake: Astrid Lindgren Children's Hospital goes digital.

When Astrid Lindgren Children's Hospital first opened in 1998 in Stockholm, management saw an opportunity to create an environment free of X-ray film, chemicals and space-consuming archives. In the ongoing struggle between shrinking budgets and increased demands for better service, digital X-ray could help save time and money.

The relatively new pediatric hospital is a division of Karolinska Hospital and is dedicated to specialized care for children and young people, as well as to research and development. With its 194 beds and approximately 1,500 employees, this hospital is one of the largest pediatric hospitals in northern Europe. "We focus on the patient" is the motto that characterizes the hospital. The idea is to bring all the expertise to the child and the child's family — the staff should come to the patient, not vice versa.

Business issues

Astrid Lindgren Children's Hospital has a highly specialized pediatric radiology department with 55 employees, including 13 pediatric radiologists and 26 specially trained nurses. Every year, a total of about 48,000 X-ray examinations are conducted at the hospital.

Right from the beginning, the intention was to create a film-free X-ray department by employing a fully digital image solution that did not involve X-ray film. The idea was to view the images digitally and store them in digital image archives.

Examinations cannot always be planned in advance. This creates demands not only on the staff but also on the technology, which must be capable of providing constant access to image data. To facilitate diagnosis and treatment, the X-ray images must also be accessible by other departments involved in the care of the patient. Comparing recent X-rays with older ones and, based on the result, determining whether changes have occurred are essential parts of X-ray diagnostics. Storage of images in an image bank offering rapid access to older images was, therefore, essential.

"Close cooperation between the radiology department and referring physicians in other departments is crucial to minimizing the waiting period for the patient. It is extremely important to be able to send information quickly so that the right physician can access the right image at any time of the day or night. Accessibility was, therefore, a key aspect of the new solution," said Lars Johansson, program manager at the radiology department of Astrid Lindgren Children's Hospital.

The solution

To meet these needs, the radiology department introduced a solution based on the Picture Archiving and Communication System (PACS). PACS is a complete image-management system for taking X-ray images, making diagnoses based on X-ray images, and distributing and digitally storing X-ray images. The problem of long-term storage was solved by means of a tape library. Astrid Lindgren Children's Hospital was one of the first hospitals in Sweden to have a PACS-equipped digital radiology department.

Sectra (a Swedish IT and medical technology company/PACS provider) was commissioned to digitize the new radiology department at Astrid Lindgren Children's Hospital in cooperation with selected partners. In connection with a system upgrade, StorageTek® was selected to supply the new storage solution that would replace the tape library. The new solution is based on the 9176 redundant array of independent disks (RAID) system. The PACS solution is designed to provide maximum availability and security, 24 hours a day.

"We have now achieved 99.6 percent accessibility, which is well in line with our initial requirements. Moreover, we no longer have to deal with the

heavy lifting and chemicals involved in traditional X-ray image management," said Johansson.

Business benefits

Referring physicians such as orthopedic specialists and surgeons, who require a great deal of image data, now have access to images via workstations set up in their own departments and receptions. Physicians also wanted access to images in their examination rooms and at their own offices, so they could show X-ray images to their patients. This is now possible through a Web-based solution. Images and responses to referrals can be sent to the departments that require access to the X-ray images, thus reducing waiting periods for the patient. Because most departments already have access to an Internet-ready PC, this solution was convenient.

Hospital efficiency has improved because old images can be quickly retrieved from the digital storage bank for comparison with recently taken images. When new X-ray images must be taken, previous X-ray images may be retrieved from the bank if needed. This has meant a considerable reduction in the amount of space required for storage because digital archives require only a fraction of the space that film-based analog files require. Even so, the volume of data that may be stored is huge.

According to Johansson, "The demands on storage environments grow as the medical establishment adopts new technologies. Examinations using magnetic resonance (MR) imaging, computer tomography (CT) and ultrasound take an enormous amount of space to store digitally."

In the summer of 2000, a special project was launched at the pediatric hospital to help radiologists work from their homes. The hospital installed a broadband solution that would enable physicians to access X-ray images from any computer — for example, when on call or when preparing for their rounds. In fact, all pediatric radiologists in the department have workstations in their homes.

Introducing PACS requires significant time and planning. A number of different suppliers are involved, and integrating all the elements requires a great deal of effort. The installation process at Astrid Lindgren Children's Hospital involved the radiology staff, the hospital IT department, network suppliers, hardware suppliers and others.

"The solution now functions very smoothly. We have become accustomed to working in the PACS environment and to the resulting improved accessibility and work environment," Johansson stated.

Plans for the future

A PACS solution must be updated with new software and new functions. The next steps for the hospital include bringing access to images via home-based workstations to other Karolinska Hospital clinics — for example, orthopedics. We are planning to eventually distribute and receive image data over greater distances. This will facilitate knowledge exchange and contribute to high-quality patient care," said Johansson.

About the technology

The pediatric radiology department of Astrid Lindgren Children's Hospital uses the latest version of the PACS image-management system, based on RAID storage servers and workstations, which allows X-ray images and radiological data to be constantly and rapidly accessible.

Image storage is based on high-accessibility cluster technology combined with mirroring systems of all image data on RAID servers.

The storage solution consists of StorageTek's 9176 Fiber Channel RAID (1.6 terabytes) system.

About the solution

The 9176 disk subsystem is an enterprise, high-performing, full-Fibre Channel RAID subsystem designed solely for open-systems environments. It offers investment protection with a pay-as-you-grow scalability and minimizes downtime costs with fast, continuous access to data.

About Astrid Lindgren Children's Hospital

Astrid Lindgren Children's Hospital, one of the largest children's hospitals in Northern Europe, opened in March 1998. It is part of the Karolinska Hospital in Stockholm, and is closely affiliated with the Karolinska Institute. This leading university hospital is known throughout the world for its contributions to medical science. The children's hospital was named to honor Astrid Lindgren (1907-2002), creator of the beloved Pippi Longstocking stories.

Case study company: Astrid Lindgren Children's Hospital

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Lars Johansson, Program Manager, Radiology Department, Astrid Lindgren Children's Hospital.

ABOUT STORAGETEK®

Storage Technology Corporation (NYSE: STK), a $2 billion worldwide company with headquarters in Louisville, CO, has been delivering a broad range of storage management solutions designed for IT professionals for over 30 years. StorageTek offers solutions that are easy to manage, integrate well with existing infrastructures and allow universal access to data across servers, media types and storage networks. StorageTek's practical and safe storage solutions for tape automation, disk storage systems and storage integration, coupled with a global services network, provide IT professionals with confidence and know-how to manage their entire storage management ecosystem today and in the future.

StorageTek products are available through a worldwide network. For more information, visit www.storagetek.com, or call 1.800.275.4785 or 01.303.673.2800.

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