Slotervaart operating theatres are going digital

When Slotervaartziekenhuis (Slotervaart Hospital) was officially opened by HM Queen Juliana on 21 June 1976, it was proclaimed the most modern hospital in Europe. The hospital was set to become an important academic centre for medical, paramedical and nursing education, and from the onset, all medical specialties were represented. In 1997, Slotervaart Hospital was privatised and caters today for approximately 140,000 inhabitants of West Amsterdam. Its renown in the field of neurosurgery and AIDS treatment, however, extends far beyond the city of Amsterdam.

The challenge
Like other healthcare providers, Slotervaart Hospital, recognised that digitising its infrastructure can enhance the quality of medical care. For hospitals, there is no avoiding the Information Communication Technology (ICT) route. That is why Slotervaart opted to make two of its seven new operating theatres completely digital.

The aim was to be able to record images from various kinds of medical scopes, store them in digital form with other images, and have all the data available in an electronic patient record (EPR). In addition, the hospital wanted to continue to develop its role as a teaching hospital and make a more significant contribution to the training of medical, paramedical and nursing personnel. Digitising will play an important role in achieving this goal.

“As a hospital, we are very interested in digital applications. Digital operating theatres are an expression of this. We want to digitally store images from operations, but also from other examinations and treatments in the hospital. We will then integrate them into an electronic patient record and combine them with other data at any place, any time. Patient care will benefit from this, as well as the training of doctors and nursing staff who will be able to access the information when necessary and watch surgical procedures from the staff room,” explained Paul Sturkenboom, Director of Slotervaartziekenhuis.

The solution
In mid-April 2004, Sony developed two digital operating theatres. They were designed in conjunction with Smith & Nephew, a manufacturer of high-quality endoscopes. The digital theatres were equipped with technically advanced systems for IP (Internet Protocol) monitoring, data storage in accordance with the DICOM standard as well as video- and audio-conferencing. To obtain a clear idea of the hospital’s wishes and requirements, the two industrial companies consulted with representatives of all disciplines concerned, including the IT department, doctors, operating-theatre personnel and builders. This resulted in a satisfactory overall solution for all parties. Sony’s innovative equipment in the digital operating theatre will assist the surgeons during minimally invasive procedures.

Two high-quality LCD monitors connected to the endoscope camera become the eyes of the surgeons and their assistants. The medical and audio-visual equipment is operated in conjunction with touch-screen and speech-recognition devices in the sterile environment. Two cameras in the operating theatre record all activities taking place there. The resultant images, together with the endoscope images, are stored digitally and can also be played back in real time.

Advantages
Digitising is a significant development in the area of healthcare. It is not only for patient care, but also for teaching purposes. It is now possible for medical personnel in training or fellow doctors to watch proceedings from remote places. All images from the operation can be stored and forwarded electronically.

“The greatest advantage is that you can store and send all the pictures of the operations. This is not only good for inter-departmental consultation, but also for teaching. We already knew Smith & Nephew as a partner for endoscopic equipment, and the company presented this concept in collaboration with Sony. What we are achieving here is fairly unique. The development of endoscopy is already progressing rapidly, but I think that digitisation will only accelerate it,” said Boudewijn Dwars, general surgeon at the Slotervaartziekenhuis.

High-quality images from the various cameras in the operating theatre, including endoscope cameras, can be used for video-conferencing. This makes it easier for another doctor to give a second opinion, wherever he or she is. Moreover, it is as simple to communicate between operating theatres as with areas outside. An additional, rather significant, advantage is that it remains quiet in the operating theatre.

Digitising also means that all data can be linked to the EPR. The surgeon in the theatre can, for example, call up X-rays from the file and display them on screen. The possibilities of digital imaging are endless. All seven operating theatres are equipped with an IP camera to send images, via the hospital’s existing intranet, to a single monitor. This allows theatre-planning personnel to see at a glance what stage operations have reached and have the next patient prepared for theatre, thereby improving planning efficiency and costs.

The digital operating theatre offers ergonomic as well as functional advantages. There are neither cables nor equipment occupying floor space in the theatre. Everything is attached to swivelling arms hanging from the ceiling, allowing the doctor to adjust them easily to the desired position. This also improves the working environment for theatre personnel. The equipment is user-friendly, and assisting healthcare personnel are far less likely to find themselves in awkward or difficult positions during the surgical interventions.

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During endoscopy procedures in hospitals, the greater part of the diagnosis is based on the visual review by the surgeon of images displayed on a screen. Sony supplies such systems, but none are standard, they are all tailored solutions where the company has focused its attention on functionality to meet the requirements of future users. The resultant design respects and supports existing processes and procedures.

A look to the future
In the not too distant future, it will be possible to link stored images to a unique patient number and integrate them into the EPR. A server in the operating theatre currently provides the storage, but that will later be handled by a central server in the hospital. It will then be possible to combine information from different disciplines.

A subsequent step will be to have the information available to other hospitals. Data will be sent “outside” via ADSL or ISDN. Obviously, access and security will be prime considerations, and users of the system need to be aware that they are working in a networked environment. That is why special attention was paid to monitoring images as they leave the operating theatre.

Conclusion
In conclusion, it can be confidently stated that the implementation of digital operating theatres will facilitate the efficient exchange of know-how and experience, allowing users of the equipment to concentrate on the most important issue of patient care.