



Bringing PACS to the OR

Project Profile;

Mater Misericordiae Health Services Brisbane



EIZO Oceania, Unt 7 / 6 Herbert St, ST LEONARDS NSW 2065

T: 02 9462 7500 F:02 9439 0470 sales@eizo.com.au

S-CAPE: a sterile digital diagnostic imaging system now available in Australia

An internationally acclaimed system of digital image delivery to sterile environments is now available in Australia.

Mater Misericordiae Health Services in Brisbane has become the first hospital in Australia to install the ground-breaking German system called S-CAPE.

The S-CAPE system is specially designed computer equipment that meets all IPX2 and 4 compliance, making this equipment suitable in sterile environments such as theatres.

The equipment combines an advanced infection control design with medical diagnostic quality displays, making the system ideal for radiology and DICOM image analysis such as PACS, a Picture Archiving and Communication System.

Infection risks avoided

According to Vicki Livett, Nurse Unit Manager, Theatres, "Striving for IPX compliance has always been our desire. With the new theatres, it is the ideal opportunity to set the bar high and make it happen, giving our patients 'exceptional care'."

A study by Guilfoyle and Gardner (*Aust Infection Control* 1998; 3(1): 18-21) found that computer surfaces are similar to other environmental surfaces, carrying the same risks for cross-infection. "With the increasing reliance on computers in patient care, this equipment must be considered an additional environmental factor for consideration in infection control. We have shown that both environmental and skin microbes are present on computer keyboards and charts. ... It is essential that appropriate cleaning methods are used frequently, to decrease the number of microbes present."

The S-CAPE system avoids the risks inherent in other IT devices, meeting stringent infection control standards by using a state-of-the-art design which includes a solid, swivelling, antimicrobial-coated medical keyboard with touchpad and a mouse which is quick and easy to disinfect.

Mater Health Services has also trialled sterile keyboard and mouse covers to enable scrubbed staff to manipulate images when required.

A study by Bures et al. (*Am J Infect Control* 2000; 28: 465-70) found computer keyboards and faucet handles to be significant reservoirs of nosocomial pathogens in the intensive care unit setting.

Mater PACS Support Manager Michael Bettenay described the advantages, saying "the unit, keyboard and mouse design is superior because all elements are sealed, so there is no risk of infections. Standard PC cooling fans pose a potential risk, but S-CAPE units use thermal conduction where no exchange of air flow occurs from outside to inside, thereby eliminating the risk."

The sealed devices means infection control is simple. The equipment is disinfected using standard theatre procedures. The equipment can withstand large amounts of moisture without any risk of damage.

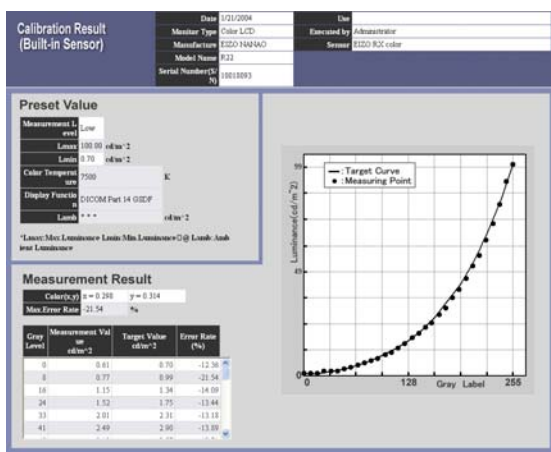
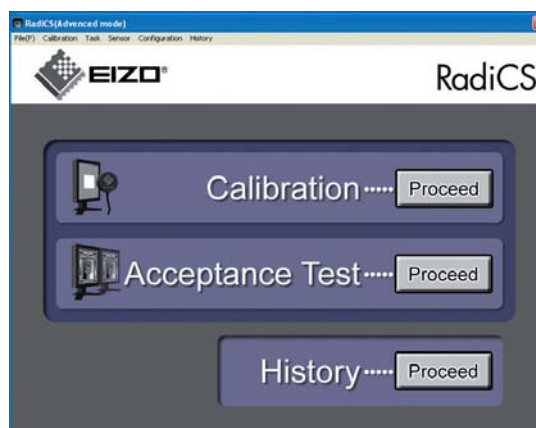


The ease of cleaning of the S-CAPE system meets the Royal Australasian College of Surgeons Infection Control guidelines and ensures time is not wasted: “Operating lists should allow sufficient time for adequate infection control activities, including routine cleaning and the appropriate disposal of clinical waste. ... Between cases, all surfaces (operating table, instrument table, equipment used and the floor) should be carefully cleaned using warm water and detergent.”

Imaging superiority

S-CAPE equipment is ideal for all medical images. It is installed with 2MP - 4MP display quality, making diagnostic quality possible. “This is essential for theatres”, said Deb Hornsby, PACS Project Manager, “as the surgeons may take further images whilst the patient is in theatre and the surgeon diagnoses in real time”. Other advantages of having the images available are:

- Instantly available when the image is taken
- Viewable simultaneously in different locations
- Diagnostic quality
- With customizable screen sizes
- Easy to access and manipulate
- Secure
- Reliable
- Able to compare previous and current images side by side
- Viewing report and images on the one screen.



According to Michael Bettenay, “the S-CAPE equipment means the difference between this hospital being able to go completely filmless and still printing film for theatre. They are very impressive units. Our spinal surgeons required the ability to view the entire spine so the two operating theatres where spinal surgery takes place have a 30-inch portrait screen, making viewing of children and adult spine easy.

S-CAPE has been able to supply exactly what is required for our specialists, ensuring the best outcomes possible.”

Some operating theatres have the PACS display monitor on a pendant enabling close viewing when required. This also allows surgeons to change views and to manipulate images if desired. The theatre solution is backed up by a specially designed mobile unit if more images need to be viewed or if any equipment fails. The mobile unit has two screens and certainly has been used in complex cases where over 10 images were required for viewing.

According to Deb Hornsby, the choices of screen sizes met all of the clinical requirements. “Eizo and S-CAPE representatives travelled to the site to measure up and explore options with the surgeons. It was at this time that the two organizations were able to map out the equipment design against need. This would not have been possible with equipment based on standard computer specifications.

“The S-CAPE devices are customizable, which makes a huge difference to the theatre staff. The ability to select wall mounts or pendant mounts was important. S-CAPE designed and worked with the pendant provider Trumpf to ensure total integration. The monitors are of sufficiently high quality that the risk of diagnostic error is minimized.” Many of the surgeons use the system for before-and-after views because of the size of the screens. Multiple image viewing was an essential requirement that had to be met.

Improved efficiency



The PACS system eliminates lost film issues, facilitates better consultation services to support doctors, promotes faster report turnaround times, and streamlines workflow operations. Faster access to images means quicker diagnosis and treatment.

Gerard Duckworth, Chief Radiographer, Mater Children's Hospital said, “PACS has made huge efficiencies in the department but the one thing that sealed the benefits was the ability to go filmless and this was possible because of the S-CAPE solution in theatres.”

The system reduces the need for duplicate tests because the same image can be viewed at the same time at multiple locations, including different hospitals and doctor's offices.

Unlike film, the PACS system enables images to be manipulated electronically, and its multimedia capability allows for 3D, video and sound clips in addition to static images.

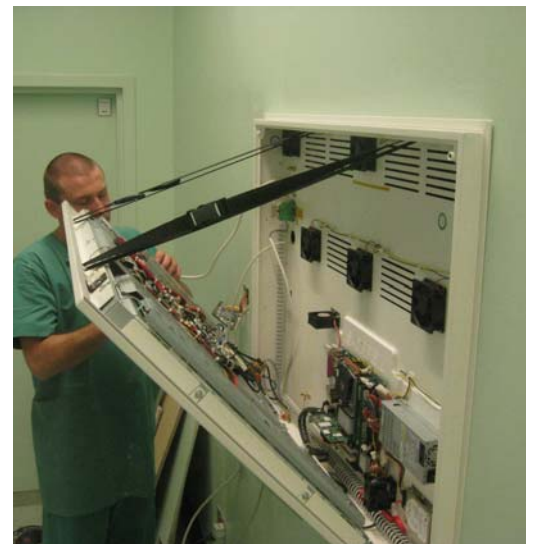
There are huge financial benefits, too, since no longer are there film processing costs, and the use of digital dictation and voice recognition means no transcription fees.

Another benefit is the ability to view a patient's previous imaging history from previous appointments. With film, about 90% of images have expired after a year or two.

Problem-free installation

The installation involved the procurement, environmental setup and mounting of 20 S-CAPE devices into the 20 theatres run at the Mater Health Services. The theatres were a combination of new and existing. The volume of services provided at Mater had to be considered when developing a plan for an installation that minimized disruption to staff and procedure bookings.

Since the depth of the monitor is only 10.5 cm, existing analogue viewers can be replaced without difficulty. The space-saving system can be completely integrated into the wall. “S-CAPE designed and built a unit to fit into the analogue space for our cardiac theatre, thereby not interfering with the theatre certification and lead lining specifications,” said Deb Hornsby. Custom-making the units to existing theatres specification is S-CAPE's specialty and the customization costs are minimal. The equipment can be installed catering for extra peripheral devices or a connection to existing peripheral equipment (such as external monitors or video signal converters). “The S-CAPE equipment was installed with DVD read/write devices for patient transfers where images are flown



in with patients from other hospitals. This has significantly reduced further risk with critical patients when transferred from other locations to Mater,” Deb Hornsby said.

Describing how the Mater equipment was sourced, she said, “We sought guidance from our clinicians, desired IPX2 compliance as a minimum so searched what was available in Australia and could not source anything that met our needs. I conducted an internet search and found the German S-CAPE provider of this equipment. We asked Matthew Bauer, General Manager, Eizo Oceania, if they could assist and they did not hesitate.”

Eizo staff travelled to Germany for training in maintenance of the equipment, and S-CAPE’s staff in Germany travelled to Australia to showcase the system to Mater Health Services staff.

Mater surgeons were then able to select a suite of devices based on their individual surgical requirements, and these were custom built.

Eizo staff photographed the locations where the devices were to be installed, so that the specifications matched the exact requirements.

Following installation, Mater IT staff tested the devices and ensured that network connectivity was available.

“Because of the level of advance planning, installation was fairly simple. Since then, Eizo Oceania has maintained the equipment in case of problems – but we haven’t had any at all.”

Mater PACS Administrator Michael Bettenay has been involved in PACS installations for a number of years and has seen numerous different installations. “The S-CAPE is the only theatre solution I have seen that has worked instantly. Surgeons are very happy not to get film and they are very happy to use this equipment in theatre.”

The only adjustment Mater staff had to make was to turn off screen savers so that images were constantly available.

No theatre disruption

Mater theatre staff were advised in advance that the equipment would be installed over one weekend. “We selected the weekend when demands were lower. The plan was to move from theatre to theatre when they became available. The equipment was installed quickly and without significant clean up. The environmental setup was co-ordinated with S-CAPE working with Mater IT Services, Trumpf, and LCE Queensland. In this way the installation on the pendants was customized and totally integrated,” Deb Hornsby said.



“There was no downtime for theatre. We were able to install to suit the theatre schedule, being very flexible to avoid disruption. The planning of the installation was a combined effort between Mater Health Services and Eizo Oceania and worked very well.”

Post-installation, on-the-job training was provided to clinical staff ensuring they were confident to use the equipment day and night. This included general maintenance tips on the equipment and system access and image manipulation. The use of “cheat-sheets” attached to the equipment meant that staff were able to reference them as needed. These additional support sheets were ideal for staff who

come to Mater theatres irregularly, such as once a week or for occasional night cases. “We used generic log-ons so that the devices could stay on all the time.”

Nurse Unit Manager Craig Steains described the S-CAPE system as “very user friendly. It took only about five minutes to educate staff on how to call up patient images. That is very unusual with new equipment. I would be the first person to hear if someone had trouble using it, but I have had no such feedback.”

Improved workflow

“Before you consider switching off film, you have to consider where the films are likely to be viewed. Many PACS installations place extensive hardware in the medical imaging departments, but it is imperative to consider the wards and theatres, I believe the installation of S-CAPE in our theatres was one of the successful ingredients in Mater Health Services being able to switch off film distribution so successfully and gain the benefits of improved workflow,” said Deb Hornsby, PACS Project Manager.

According to Mater PACS Support Manager, Michael Bettenay, “workflow has definitely improved since moving from plain film to Digital PACS on S-CAPE for all the reasons you ever go digital – the constant availability of images, no possibility of lost films, multiple users in multiple locations can view the same images at the same time, and images are always available. You can manipulate images in theatre, which is quite handy, and you can even do 3-D reconstructions of images in theatre.”



Nurse Unit Manager Craig Steains agrees that workflow has improved vastly. “We are not having to carry films around and we are not wasting time locating things. In the past we found that some patients would come to theatre without films, and you would have to contact the ward, which would have to locate those films. Then you would have to contact the wardsperson to transfer those films to theatre. That happened on a fairly regular basis.

“We often seemed to be chasing films. For some procedures, such as orthopaedic surgery, it is quite critical to have the films quickly. With PACS we don’t have to worry about that. We can call up the images and are ready to go. It has made a big difference.

“The scrub nurses, too, have reported that they are happy that the images are in the theatre at all times. We have had only the odd film that was taken years ago and the medical imaging department had to copy that across to the PACS format. These are very exciting changes.

“From my point of view, it is very easy to call up a patient’s name and have their images and reports immediately. The main benefit is having the equipment reliable and working – which it is. It is very easy to use. It has meant that nurses in our preoperative holding area did not have to chase up films. It is efficient to have the images wherever the patient is.”

Mater Orthopaedic Surgeon Dr Simon Journeaux summed up the Mater experience with S-CAPE, saying the S-CAPE system has “reduced the hassle factor. You are not worried about where the films are. We are very happy with it.”