



Dr. Eric Tetteroo, Radiologist, Department of Radiology

Ease of Use

Furniture and lighting play an important role in a satisfying PACS implementation

When it comes to the ease of use of a PACS, the technical aspects (the software, the screen, and so on) are obvious. But the working environment is equally important. Many organizations see the furniture and lighting as added costs, rather than an extra source of value. When setting up a digital workflow in 2003, the Jeroen Bosch Hospital in 's-Hertogenbosch, in the Netherlands, saw ergonomics as a significant part of enabling the best diagnosis possible.

Merging the four hospitals around 's-Hertogenbosch to form the Jeroen Bosch Hospital brought all the radiology, nuclear medicine and cardiovascular departments together into a single imaging organization. One goal of reorganizing was a unified, digital environment to ensure efficiency and quality. This meant using the possibilities offered by the change, and by modern computer support (RADOS RIS, EasyAccess PACS and SpeechMagic voice recognition software), to streamline reporting.

“Many departments, transfer the film workflow, one-to-one, to digital,” explains Mr. Harm Geraedts, Business Manager of the Imaging Center. “But it is not just a case of replacing light boxes with screens. It is about realizing what working digitally makes possible.” A lot could be learnt from the hospital's Carolus site. This was one of the first sites in the world to use a Philips PACS, which meant a wealth of in-house experience on best practices, and many ideas on what could be done better. The comfort of the workplaces was one issue. “Ergonomics and workflow cannot work without each other,” explains Mr. Noot Maas, Chief Information Office of the Imaging Center. “Ergonomics is part of imagining how you want to work.”

Variety of input methods

Dr. Eric Tetteroo, Radiologist, Department of Radiology, was closely involved in planning the PACS implementation. For him, imagining best practices included the physical conditions for interacting with the system. “Traditionally radiologists have developed arthritis of the neck working

with light boxes, now they are at risk of repetitive stress injury from working with the mouse,” he says.

He highlights the importance of having a high quality mouse, preferably one that can be used in both the right and left hand. A gaming mouse (one normally used for computer games) might also be worth considering. These have extra buttons that could be assigned to simplify access to PACS features, and a high scrolling resolution for browsing quickly through large data sets. With the ease of connecting mice, trim wheels or trackballs by USB, Dr. Tetteroo also proposes having several pointing devices, to ensure variety. He also favours using keyboard shortcuts: as many alternatives as possible to eliminate repetitive motion.

Sitting comfortably

An important part of the project was to standardize workplace hardware, so any radiologist can use any reporting station. This is possible because the arrangement of the EasyAccess PACS on the screens depends on who is logged in, and not on the computer. But this means accommodating different radiologists at the same desk. Dr. Tetteroo stresses having furniture that adjusts easily. If the threshold to adjusting the desk or chair is too high, people tend to ignore the discomfort, which leads to fatigue.

Because medical computer workplaces are a recent development, such elements are overlooked in many other installations. Though radiologists often report on patient complaints resulting from badly organized PC workplaces, ironically, the radiologist's workplace is often worse. This is particularly unfortunate in the significant number of cases where computer-based reporting has become a full-time job. Philips German partner for radiology workplaces, MeDiSol, have even developed an ergonomic toolkit. This recommends the height of the stool according to the doctor's height, measures the correct distance to the screen, checks the tilt of the keyboard, and has a mirror to check for the sources of reflections.

Easy on the eyes

Where possible, the original lighting was replaced by indirect lighting that reflects off the walls behind the reporting stations. This eliminates reflections on the screen. A dimmer lets the radiologists adjust the lighting to their personal preference. Ambient light should be less bright than the screen, to ensure the features of the image can be best and most easily recognized. In the Jeroen Bosch Hospital, the low light level is simplified by having all the paperwork scanned into the RIS. Even much of the reference material is consulted on the screen from PDF documents or web-sites. There is little need for extra reading light.

Dr. Tetteroo checked and turned down the brightness of all the auxiliary screens (to 25 to 30%). The setting out of the box was too bright, resulting in uneven lighting across the

screens, which meant too many adjustments for the eye, leading to fatigue. To keep the field of view uniform, the surface of the tables are matt to reduce reflections (the ideal is a dark gray with 60% reflectivity). Similarly, where possible the wall and floor coverings minimize reflections.

Simplified organization

The staff in the Imaging Center had full control of their budget for the PACS project. This was decisive in maximizing the overall value of their investment according to their own priorities, and independently of the concerns of the IT, facilities management and purchasing departments. “If buying a good chair seems like the best way to ensure productivity, it is our call,” says Mr. Geraedts.



Harm Geraedts, Business Manager of the Imaging Center (left) and Mr. Noot Maas, Chief Information Officer of the Imaging Center

Philips was ready with advice and suggestions from its experience and best practices at other sites. Not all of this was applicable to the hospital's situation. “They supplied us with possibilities,” says Mr. Geraedts, “but also left us the freedom to decide what we thought was best.”

“Our goal is to make a good examination, which is faster for us and for the patient,” says Mr. Geraedts. The carefully planned change to a unified PACS, taking in all aspects of the digital workflow, has made this possible. The final stage of merging the original hospitals, in a move to a new, purpose-built location in 2010, will let them apply this experience further, to continue making work flows simple and comfortable, for the best diagnoses. <

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