

## Volume 6 - Issue 3, 2006 - Cover Story: PACS & IT

### Requirements for a Multidisciplinary Team Meeting Room with PACS

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#### Choosing the Right Setting and Equipment

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Once your hospital becomes filmless, with a hospital-wide PACS (Picture Archiving and Communications System), all radiological images are only visible in digital format. It is important to remember that the Multidisciplinary Team (MDT) meeting becomes the "showcase for PACS" to all clinicians in the hospital. It is thus vital to plan an MDT room which is fully fit for this purpose. Within the Imaging Department here at Hammersmith Hospital, we have implemented a new MDT room where the vast majority of our 30+ MDT meetings take place on a weekly basis. There is a lead clinician in charge of each MDT, and a lead consultant (staff ) radiologist responsible for the associated imaging. Most of the MDTs have a second consultant radiologist in attendance, who provides a second radiological opinion if required, and who covers for his/her colleague during periods of leave. The purpose of an MDT meeting is to review the imaging studies (and histopathology) on patients currently under the care of a particular clinical discipline, in the light of their clinical symptoms and findings. Based on this assessment, future management and treatment is planned.

#### MDT Room Environment

When designing the MDT room, it was important to ensure that it should have a modern, clean look, so that it provides a pleasing environment in which to work. Chairs need to be moderately comfortable, although not sumptuous, bearing in mind the constraints of the National Health Service (NHS) budget! There are small flip-up tables attached to each chair for the audience to take notes (it is useful to have some chairs designed for left-handed people, with their attached tables on the left-hand side). Flooring is synthetic durable vinyl, with a wood pattern. This was chosen for practicality, since it is often impossible to stop audience members bringing food or drinks into the room for lunchtime and evening meetings, and carpet flooring is not easily washable in the case of the inevitable spillages! Waste bins are provided in the rooms to encourage users to keep it clean.

#### Technical Requirements

The imaging studies being reviewed have almost always already been reported. Thus the PACS monitors used and the overhead display images need only be of review quality, rather than of the highest diagnostic quality. We use dual 1 megapixel monitors and two LCD projectors each of 1,397,760 pixels (1365 horizontal x 1024 vertical) and 220W UHB lamp. The viewing conditions are of paramount importance. In our opinion, it is essential to have a continuous dimmer switch light, which can be lowered to a level optimal for viewing images, whilst allowing the audience to take notes. There should be full blackout blinds at the windows, although with a facility to have less extreme blackout should the room be used for other purposes, such as general meetings. We have chosen full blackout roller blinds, with an inner set of independent vertical navy blue slatted blinds for use during non-radiological meetings.

We have chosen to invest in a dual headed PACS workstation, with both of its monitors projected, via separate overhead projectors, onto large wall screens (as seen in figure 1). The modest additional cost of having a dual headed workstation with dual projection is more than vindicated by the vast improvement in the display of radiological images thus obtained. It means that different imaging modalities on the same patient can be simultaneously compared, and that current and historical imaging studies can be clearly displayed simultaneously for easy comparison by the audience.

## **Workstation Requirements**

Regarding the PACS workstation itself, this needs to be a review PACS workstation rather than a diagnostic workstation. Landscape style, rather than portrait style monitors are preferable since all the overhead projection equipment derives from the commercial film industry, and is designed to synchronise best with landscape style screens, as for television and cinema film viewing. Web browsers, running on ordinary PCs, generally do not incorporate sophisticated PACS software. It is this sophisticated PACS software which is so useful for MDTs. Such software includes folders, which can be populated with the names of the patients to be reviewed at the MDT and more precisely, with the exact study to be reviewed at the meeting.

In contrast, web browser technology generally only permits searches on the name of the patient, or hospital number, and most web browsers do not allow folders of specific examinations or patients to be made up in advance. We advise the use of sophisticated PACS software for an MDT conference room because we insist that the MDT list be compiled at least 12 hours in advance of the meeting. It is the responsibility of the clinicians attending the MDT to compile their PACS folder in advance, including the precise studies they wish the radiologist to review. PACS folders can also be used to assemble anonymised images for teaching seminars, also held in the MDT room.

## **Good Preparation is Key**

The compilation of MDT conference folders on PACS allows the radiologist to prepare for the MDT, reviewing these studies in private in advance of the meeting, so that (s)he can give a succinct and didactic synopsis of the pertinent imaging findings in front of the MDT audience, without wasting time while (s)he reviews the images on the fly. In this way the clinicians and the patients get the best deal, with careful review of the images and comparison with previous studies and other modality imaging having been performed in advance by the radiologist responsible for the particular MDT radiology.

As this radiologist reviews each patient's images in turn during the meeting (s)he can then choose to discard that patient from the folder once reviewed, or can leave the patient's images in the folder if the patient is to be reviewed the following week, or should follow-up actions be required, for example, adding an addendum to the issued report or arranging for other imaging studies to be performed. At Hammersmith Hospitals Trust, we have chosen to have our speech recognition software also fitted to the PACS workstation in the MDT room, so that the radiologist can add an addendum in real time at the meeting to the report, capturing any differences in opinion from the radiologist who issued the report, and/or recording the decision taken at the MDT as to further management, for example proceed to a PET scan or making a note of the histopathological findings.

## **Other Useful Additions**

Our MDT room contains a microscope, which can also be projected onto the overhead monitors directly as well as a stand-alone PC with internet access, which can then be used to access literature during the meeting, or to display imaging studies sent into the MDT for review, from outside referring hospitals. We have found it necessary to install a DICOM viewer as well as a JPEG image viewer onto this stand-alone PC, since not all imaging studies referred to us on CD have a self-launching viewer incorporated onto the disc.

A simple wall panel in the room allows either the left or the right, or indeed both PACS monitors to be slaved to the overhead projectors, or for the stand-alone PC or microscope (or video recorder/DVD player also in the room) to be shown simultaneously on the overhead projector.

## **Don't Forget Security!**

All this expensive technological equipment needs protection against theft, which is why we have a 6-digit door code lock on the door (see figure 2). Security cannot be overemphasised, and despite the precaution of this lock, we have still experienced a theft of the PC flat screen due to failure to leave the door properly closed overnight, but then, after all, the Hammersmith Hospital is right next door to one of the largest high security prisons in London.

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