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Overview of the PACS procurement project within South West London

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ABSTRACT

Picture Archiving and Communications Systems (PACS) as the future of radiology is generally accepted, but the challenge is how to deliver this technology to meet the needs of the changing NHS and support evolving patient care packages. Within South West London there is also the challenge of affordability: PACS is not a cost-neutral solution and requires substantial funding support from both secondary and primary care. It is to overcome these issues that a new approach has been taken within South West London. The six service providers have formed a consortium to procure a single sector-wide PACS system to meet the needs of the sector as a whole and deliver the system at the most affordable cost. The project is still in its early stages but, to date, all of the providers are working together and the procurement process is under way. Remaining challenges include funding the project following *Shifting the Balance of Power* changes, the networking to support the project, and patient identification within a multi Patient Administration System/Radiology Information System (PAS/RIS) environment.[4]

Keywords: master patient index (MPI), networking, sector PACS

Introduction

This paper provides an overview of the current work being undertaken within South West London to procure a sector (community) Picture Archiving and Communications System (PACS). This is an innovative and strategic approach not only to PACS but also to the procurement of information technology (IT) systems in general.

Vision

The concept of a joint procurement and implementation of a sector-wide PACS is a significant start to the rationalisation and more effective use of technology to support patient care across and between organisations that make up the local health community. The move to collaborative implementation of technology will greatly enhance support for the patient journey and facilitate the movement of care with the patient. The opportunity provided by a joint sector approach also enables the growth and improved operation of clinical networks and, in these areas, movement of information with the patient is crucial to effective and timely patient care.

The strategic case

The use of IT to increase the effectiveness in delivery of care has been central to all strategic guidance issued under *Information for Health* and *The NHS Plan*.[1,2] Radiology departments, in particular, rely increasingly on IT to deliver their services, and the implementation of PACS is at the forefront of most departmental solutions. However, one of the most important aspects of PACS is its impact outside of the radiology department: it is estimated that at any one time up to 35% of x-rays required in outpatients departments are missing, resulting in wasted time, money and resources.[3] The management, movement and control of films is both expensive and time consuming, when this is considered along with the costs of the core materials of film and chemicals used in the existing process. A clear case exists for reviewing and procuring new methods of radiological image management and storage.

However, PACS is not a radiology system alone, it is a medical image management system to support the complete patient pathway of care. This is central to the delivery of clinical pathways whereby the patients' images are needed across diverse and often geographically remote settings.

Sector-wide approach

Most PACS implementations to date have been delivered on a single trust solution with the system constructed to manage the images within a local clinical environment. Initially PACS has serviced the local radiological part of the organisation but current health trends and patient care require the use of such technology to extend the boundary of any single organisation, even between primary, secondary and tertiary care. If current procurement trends continue with the implementation of local PACS facilities, the opportunity to share information and technology will become more difficult and costly to the National Health Service (NHS).

Current PACS technology is moving more and more to industry-standard methods of image management, communication and storage. The flexibility that this standardisation enables will support local clinical requirements, whilst facilitating central archiving and retrieval, allowing a single system to utilise best-of-breed technology across a large clinical area.

By taking a sector approach, the benefits of a PACS solution can be achieved, allowing the image and respective diagnosis to follow the patient wherever they can best be treated, irrespective of where the image was taken. This is important when clinical areas such as cancer services are considered, the move towards more primary care-focused diagnostic services and the specialisation of treatment across the sector, such as Rapid Diagnostic Centres (RDCs)/Diagnostic and Treatment Centres (DTCs). The medical image will be available where and when needed, irrespective of point of capture.

One final advantage to this approach is economies of scale, not only capital costs but also procurement, implementation, training and support costs.

Organisation overview

A proposal was drafted during the summer of 2001 to develop a sector-wide PACS strategy. This was presented to the acute and health authority chief executive officers (CEOs) and approval was given to develop the concept further. Following this, the six local trusts formed a consortium led by the CEOs with a unified project board chaired by a primary care trust (PCT) CEO. The project is directed through the local implementation strategy (LIS) with local site teams. The South West London consortium comprises all acute services across the new South West London Strategic Health Authority (previously supplied by Kingston & Richmond Health Authority, Merton, Sutton & Wandsworth Health Authority and Croydon Health Authority). There are six trusts involved as follows:

- St George's Healthcare NHS Trust, comprising three hospital sites
- Epsom & St Helier NHS Trust, comprising eight hospital sites
- Kingston Hospital NHS Trust, comprising three hospital sites
- Wandsworth Primary Care Trust (Queen Mary's Hospital)
- Mayday Healthcare NHS Trust, comprising two hospital sites
- The Royal Marsden Hospital NHS Trust, comprising two hospital sites.

Historical perspective

There is a history of strong cross-site working within South West London, for example:

- the consultants operating at Queen Mary's RDC come from the clinical teams at Kingston Hospital, St George's Hospital and St Helier Hospital
- Kingston Hospital supports many of the services to Queen Mary's Hospital
- St George's Hospital has clinical and academic links to Epsom & St Helier Hospital
- The Royal Marsden, as a dedicated cancer site, has links to all providers within the sector
- St George's Hospital, as the tertiary centre, provides for the neurology and cardiology services across the sector.

There are well-established plans to increase cross-sector patient care pathways and these include:

- the opening of the new private finance initiative (PFI) cardiology and neurology centre at St George's Hospital
- the redevelopment of Queen Mary's Hospital into an RDC
- the opening of the Orthopaedic DTC at Epsom Hospital
- the redevelopment of Purley Hospital into an RDC
- the development of an imaging centre at Kingston Hospital.

The need for all sites to acquire PACS has been established, not only to achieve the targets under *The NHS Plan* and *Information for Health* but also to support local developments and modernisation plans.[1,2] It had become apparent though that, with the large gap in affordability and the need for a more sound strategic approach to the implementation of PACS across the local health community, the sector approach should be pursued.

This approach is in common with other countries, where there is now an appreciation that the implementation of PACS across large communities, as opposed to within discrete organisations, represents a paradigm shift that offers significant opportunities to support new and better ways of working.

Progress so far

The consortium has built a single output-based specification (OBS) for the sector, the procurement has started utilising the negotiated procedure route, and the invitation to tender has been issued. The outline business case is at approval stage having been permitted to begin procurement. Early work is under way on the full business case. The joint work across the sector has proved excellent so far and, commercially, the suppliers who have now been short-listed see this as the model for future PACS solutions, as the sector is a natural community and PACS supports the clinical networks and patient care pathways. The project has some tight timescales as new PFI builds are opening with the expectation of PACS being installed including St George's new neurology centre, the orthopaedic DTC at Epsom and the RDC at Queen Mary's, for example. The consortium members also include The Royal Marsden and hence cancer network support.

Technical solution

The consortium did not define a technical solution; rather, it provided an OBS to the suppliers for a single PACS solution. This allows the suppliers to be innovative in their design and could encompass ideas such as applications service provision (ASP) models for long-term storage. As the consortium is still in negotiation with the suppliers, there is no defined proposal yet.

The solution could be as shown in Figure 1: a central archive connected to the sector network. Each of the sites would have a local RAID (redundant array of inexpensive disks) for short-term storage (up to 18 months), but all images would be held on a central archive within a single patient folder. This would allow the images to be available to any authorised user within the sector and deliver a revolution in radiology services across South West London.

Challenges remaining

A range of challenges still remains; these include selecting a suitable single vendor, financial affordability, networking across a sector and unique patient identification. These challenges all exist within a single site PACS installation but, when extrapolated to a sector level covering 1.3 million patients, 18 hospital sites, five Patient Administration Systems (PASs) and Radiology Information Systems (RISs), the logistics problems escalate. The consortium is approaching these challenges in several ways.

The trusts are working together to select a single vendor; the clinical, technical and finance teams at the sites are working as a unified procurement board and to date have agreed on all steps towards a single supplier. This is a major achievement when one considers the range and diversity of clinical needs within the sector, varying from small community departments to acute accident and emergency to specialist centres for cancer and neurosciences.

With regard to the economic case, clinical staff require the system, as they know it will improve patient care dramatically. However, the drawback of PACS is the cost. Even with savings associated with a central procurement and economies of scale of a project of this size, PACS is not a cost-neutral system. There is an affordability gap and, although there are many cash-releasing benefits from its implementation, the vast majority are qualitative and therefore non-cash releasing, although they do provide considerable health gain improvements; examples include:

- how long a junior doctor spends looking for films before a ward round
- how long outpatient nurses spend looking for films when the patient has been referred from another unit and the films have not arrived
- the costs to the patient of having to travel to different hospitals for examinations and outpatients appointments just because that is where the x-ray films are
- the significance for an emergency patient in casualty at the weekend when the doctor does not have access to the patient's previous images because the film library is closed or the films are at another site.

All of these are benefits that a PACS system will deliver, but none can be seen on the bottom line of a business case. Funding this gap is the challenge. The
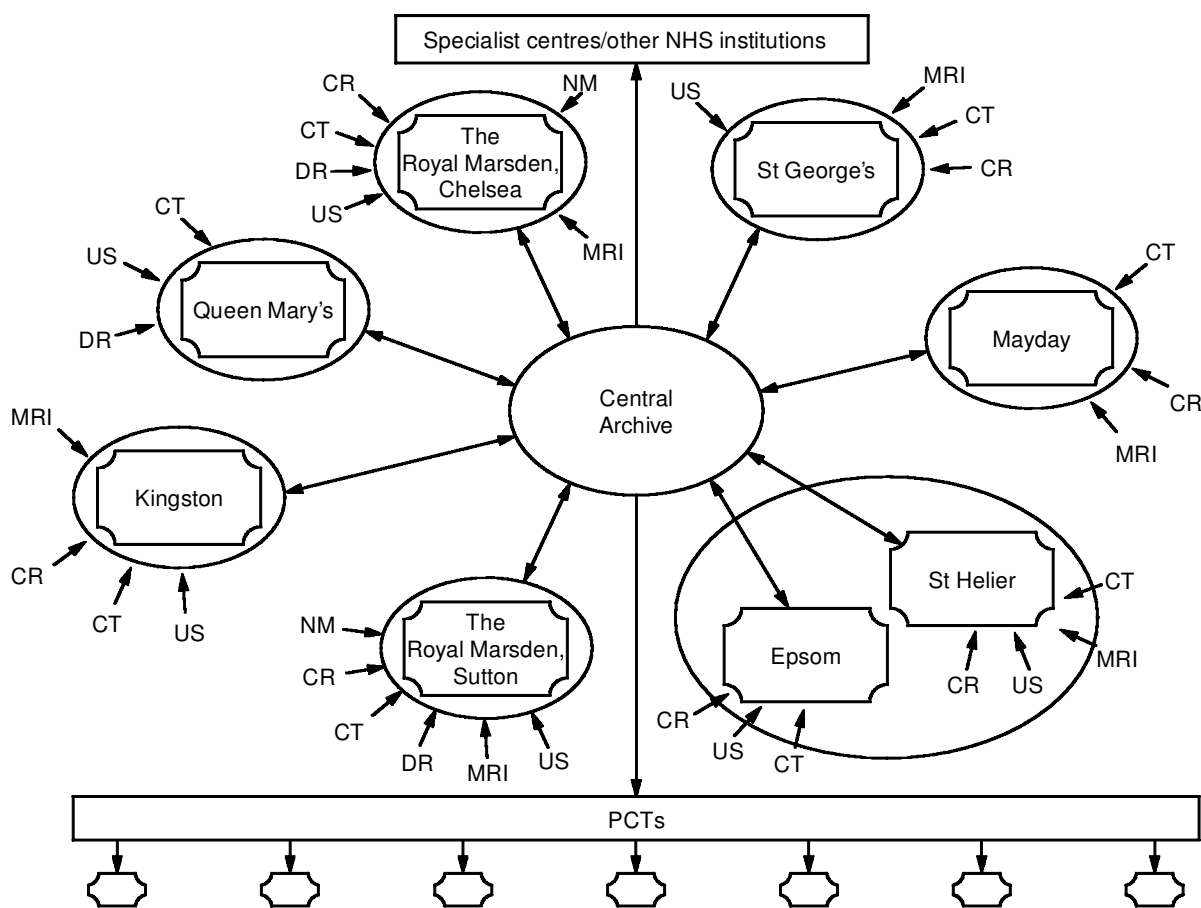
CR: Computed Radiography, CT: Computed Tomography, DR: Direct Radiography, US: Ultrasound, NM: Nuclear Medicine, MRI: Magnetic Resonance Imaging

Figure 1 Schematic for a potential sector PACS solution

solution when achieved will improve patient care dramatically, and also the working lives of the medical professionals involved. Following the implementation of *Shifting the Balance of Power*, the commissioners of the services are the newly formed PCTs and it is from these bodies that the project has sought the support for this funding gap.[4] The chair of the Project Board is a PCT CEO, and the approach is to ensure that PACS is seen as a community-wide solution not just for radiology but as a clinical imaging system.

Networking is literally the backbone of a PACS solution; get it wrong and the system will not deliver the expected benefits. Getting it right, however, can be expensive. This is true within a single site system; at a sector level these problems are increased considerably. The approach taken within this project is to separate the two: PACS and sector networking. This was taken because the network would be utilised by more than just PACS, as the need for greater communication between organisations grows to support national service frameworks, clinical pathways, DTC and RDC developments, the electronic bookings project, the

greater the need of PCTs to be connected to general practitioners and acute sites and national projects such as Human Resources and payroll. All of these would require a network of greater bandwidth than the NHSnet could and would provide. A separate project looked at the current needs of the sector and the future needs including PACS. Work was undertaken to look at existing connections and a strategy drafted to create a virtual private network (VPN) across the sector, predominantly utilising microwave technology. The cost of this solution will, in the medium- to long-term, actually save money as there is a range of existing network links across the sector with large premiums, but these do not form a strategic or resilient network. This financial benefit is further enhanced when in the future the system will be capable of IP (Internet protocol) telephony and so all local inter-NHS telephone calls will be 'free of charge' over the network.

The final challenge is to create a unique patient identifier for the system to operate on. This is essential as the true benefits of the sector solution can only be delivered if the patient can be identified easily within

one 'folder'. As previously mentioned there are five PAS and RIS systems within the sector, all using different numbering systems, but with the possibility that any of these numbers could represent different patients across the sector. The NHS number would seem a logical choice but, with only 80%+ hit rates on the current PAS systems and no instant look-up at accident and emergency departments, an alternative solution has been sought. This was approached from two directions. Initially, within the OBS, the suppliers were challenged to solve the problem by developing their systems to handle multiple numbers and so resolve the issue of a single folder. Secondly, as a sector there was a need for a single unique patient identifier for projects outside of PACS, such as electronic booked admissions, cancer networks and eventually the electronic patient record (EPR). A separate piece of work is underway to look at creating a unique patient record across the sector from the Exeter database and using an interface engine to link this to all of the PAS systems and therefore through to the RIS and PACS systems. This project is in its early days but is progressing well and may support the supplier's solution or replace it.

Summary

The project described above is both innovative and challenging but the realisation of the solution and subsequent benefit delivery will show the way forward for community PACS systems of the future. It is still ongoing, with the objective of contract signing in late 2002 and the first trust being installed and going live around Easter 2003. The procurement process is ongoing and so no specific supplier or contract details can be released at present but, commercially, the project is viable. The next few months will prove very challenging but the project board are confident of delivering the solution to the sector.

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