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The English National PACS Programme

Picture and archiving communication systems (PACS) are now embedded into the day-to-day work of the NHS in England. By December 2007 all hospital trusts in England were using PACS, digital imaging technology which enables x-rays and scans to be made available simultaneously at multiple locations within a hospital trust.

PACS has been helping to support major improvements in both the speed and quality of diagnosis and treatment of patients and they are getting faster, safer treatment as a result.

Now that the technology is in use across England it's easy to forget how big an achievement the national roll-out of PACS actually was. While it was a massive undertaking, involving hospital trusts across the country, it took just three years to complete

Compare this to the fact that, prior to the national PACS programme, only 50 trusts had implemented digital imaging systems of some form, and many of these were confined to radiology departments rather than being site or enterprise-wide. It took 14 years to reach that point and of these 50 trusts, 18 eventually switched to the solutions provided under the national PACS programme.

The picture prior to the national programme was therefore very patchy, with no real momentum on a national basis to deploy PACS. The national PACS programme saw a team from NHS Connecting for Health –part of England's Department of Health - work closely with colleagues in the Strategic Health Authorities, individual hospital trusts, clinicians and their representative bodies and IT service providers to ensure that trusts were able to implement the technology, and therefore benefit from film-less working, as quickly as possible.

The national programme's collaborative approach has seen it win recognition both nationally and internationally, with many foreign health services keen to learn from our experiences.

Moving Forward with Image Sharing

Now that countrywide PACS coverage has been achieved, the national PACS programme has been working to 'join up the dots' by increasingly focusing on the safe sharing of diagnostic images and reports across trusts in order to support patient clinical pathways.

The long term ambition is for clinicians to be able to gain access to images and reports via the use of the patients' electronic care records – otherwise known as the 'NHS Care Records Service'. However, the feasibility and timescales of this depends on the roll-out of summary care and detailed care records in England, plus other factors including the wider adoption of the NHS Number (the unique patient identifier for NHS patients in England).

There is however a golden opportunity and a clinical imperative to share images and reports to support patient pathways in England, particularly with the growth of stroke, trauma and cancer networks, by implementing technology available today that would allow clinical staff to find, view and source diagnostic images and reports when required.

Rather than be held back by the availability of future technology, the programme has been working with its many stakeholders in a creative, pragmatic and cost-conscious way to implement solutions which meet many of clinicians' most pressing requirements now. The major advancements today are in the "View it, Source it" area and a mechanism to signpost clinicians to the trust where the patient was last treated is being investigated.

The "View it, Source it" concept is extremely straightforward. As the images with PACS are digital they can be viewed via secure web links; this is already standard within hospital trusts and can with some PACS be expanded for trust-to-trust viewing. Then, if the clinicians believe they need the 'image and report', the images can be transferred to them via a number of mechanisms. Because clinicians are choosing to look for images and reports in specific locations they can ensure they have the necessary patient consent and have a legitimate right to view the information locally.

Many trusts have been using the 'web view' facility offered by their PACS in order to view images acquired at other trusts as part of a patient's care pathway. An initiative known as the North West PACS Web Portal builds on this approach. It was conceived by Dr. Rhidian Bramley, part of the national PACS programme's clinical team and a champion for PACS both in the North West of England and nationally.

The portal provides a single point of access to the local PACS of any participating site, enabling clinicians to request remote web access to trusts' PACS where this supports patient care. Access requests are sponsored by the Caldicott Guardians at each organisation through an agreed data sharing protocol. Authorised users are given a PACS logon ID for the trust they wish to access and the trust firewalls are configured to allow remote access. The portal overcomes the issue of users having to remember multiple logon IDs, through an agreement whereby trusts cooperate to provide each user a single unique user login ID for all PACS access via the portal.

Using the portal, clinicians can review images and reports remotely but also arrange point-to-point transfer of images where further analysis is required.

As of today, the portal has 44 participant trusts, most of which are in the North West and West Midlands, although interest further afield has seen a number of trusts from outside the region 'sign up' too.

Being able to view the image before acquiring it for your trust reduces network traffic and volume of image transfer, however it may be that the clinician does require the image and report and this is where image routing technologies come in to play. Image routing technologies are mechanisms by which trusts can share images, and sometimes reports, with agreed and trusted partners via a hub and spoke arrangement – these have emerged as an important element in our image sharing approach. The aim is to initially link up known clinical pathways, where trusts have an agreed referral pattern. It is felt by a number of clinicians that, equipped with a web viewing tool and an image router, they would be able to meet the majority of clinical requirements supported by data sharing.

In London, for example, the programme has been rolling-out a system called PACS Exchange, which enables the hospital trusts' existing PACS to post images to and access images from a centralised point.

So, if one London trust refers a patient to a different London trust for a specific scan, all the relevant x-rays and images can be called up on PACS. The referring trust simply searches for their patient, highlights the images needed and selects PACS Exchange on the menu to send them to the receiving trust.

Images are sent to one of two folders on PACS Exchange – the 'emergency folder' or the 'elective folder'. Images in the emergency folder are available for 18 hours, and images in the elective folder are available for eight days. The 'receiving' trust can then access the images during whatever period for which they are available.

Following successful pilots at the Royal Marsden and Mayday hospital trusts, 11 trusts were using PACS Exchange as at the beginning of February 2010, and more will follow during the course of this year. The system is starting to make a real difference, particularly to multidisciplinary team meetings, where clinicians at different trusts and sites need to discuss particular cases. The only drawback is that this solution is for London only and many patients are referred to the major London hospitals from other parts of the country. So a more nationally available solution is required.

A further image sharing initiative – one with a more national outlook - is the Image Exchange Portal (IEP). Initially conceived as a means of supporting the sharing of images and associated reports between hospital trusts and NHS-commissioned independent sector healthcare providers, NHS feedback led to the scope of the IEP to be widened so that it can be used to support image sharing between NHS trusts.

As with PACS Exchange, IEP involves the routing of images (and reports) via a centrally managed router. The service is based on an established referral relationship between the requester, sender and recipient.

By the end of January there were 54 trusts and four independent sector healthcare providers able to use IEP for sending and receiving imaging studies and we are working to have 120 trusts live with the system by the end of March.

Image router solutions like the Image Exchange Portal and PACS Exchange are set to become the prime image sharing solutions within England, at least for the next few years.

Meeting Needs Now

In conclusion, solutions that allow clinicians to "View it, Source it" are meeting a need at local, regional and – in the future – national level. The missing part of the equation is "Find it" and the feasibility of including a patient's imaging history in the summary care record is being investigated. The current available solutions are helping trusts to reduce the time, cost and effort of moving images around, protecting patient information and freeing-up staff to perform other activities. In the past, many of these images would have been burned onto CDs, requiring many hours of staff time. Now, electronic solutions are beginning to ensure that images and reports are safely shared electronically in a matter of minutes.

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