



Author's note:

The NHS National Programme for IT (NPfIT) presents healthcare with the opportunity to transform patient care. Though this article is about an electronic patient record implementation that took place 12 years ago, its goals— benefits realisation, beneficial changes to operations and integrated information systems of value to managers and clinicians—are still valid for NPfIT. So are the challenges of a major IT implementation it describes: training, data quality and changes to procedures and jobs.

Going Live

Colin Jervis charts the battles of the London-based St Mary's trust to set up its information system, which covers four hospitals

In September 1992, St Mary's Hospital trust in Paddington, London, signed a contract worth £5m over six years to create an integrated hospital information system.

The business case for the deal was backed by a trust-wide benefits realisation plan, which identified the main benefits as reduced manpower, more efficient income gathering, reduced lengths of stay and savings in consumables.

Within a month, the first stage of what was named the 'CareLink' project was under way. This is the story of what has happened so far and some of the lessons learned.

Under the contract with McDonnell Douglas (MDIS), St Mary's did not buy software and hardware outright. Instead, MDIS agreed to provide a service to the trust that would be managed by levels of system availability and response times. A series of formal milestones were set, each triggering more functionality and an increase in staged payments. MDIS would run the system from its own hardware at a secure site in Hemel Hempstead.

The main components of the service cover patient administration, contract management and order communications.

We also planned to connect it with the existing Risformation radiology and Telepath pathology systems. The core applications were to be linked to the existing maternity system and, for costing purposes, to the Finance GL Millennium system.

St Mary's trust comprises four hospitals: St Mary's at Paddington, St Charles at North Kensington, and the Samaritan and Western Ophthalmic hospitals. The first step was to link these through optical fibres and conventional telecommunications links. Some of the newer buildings were cabled extensively, with data ports in each office for future developments.

After installing the network, we set out to replace the PAS, a tough task. All the trust's reference files and patient numbering systems had to be reviewed. The job was not easy.

For instance, all four hospitals used a different form of patient identifier. We had to ensure that reference files could be used not only by operational staff meeting patients each day, but also by information staff making use of the data collected for external and internal reports. Good data structures are needed before bringing in a new computer system, or it can make things worse, not better. Before going live, strong procedures were needed to back up data. But users weathered the squalls and we met the first target on time.

With the new PAS in place, St Mary's set about moving the recording of admissions, discharges and transfers to wards. Close to 900 nurses and ward staff had to be trained in the CareLink systems, in three rooms specially prepared for the task. Full training in the admission, transfer and discharge functions took a day. The staffs skills varied: some had never even seen a computer keyboard. But even some of the most nervous became enthusiastic supporters of the system.

The training team constantly checks the progress of staff, and further help is given to those needing it before they get access to the system. The trainers also check their own standards through anonymous questionnaires at the end of each session, and regularly watch newly trained users at work.

On weekdays, ward clerks record most patient movements. But out of normal hours and at week-ends, nurses work directly on the PAS. The training team and the nursing co-ordinator monitored how long it took to record patient movements and gave extra training and advice when needed. When the order communications system goes live by the end of this year, patients will need to be admitted to wards immediately, to allow tests to be requested.

We found that the time taken to record admissions, transfers and discharges fell dramatically, making bed management much easier. It was simpler to ensure that patient details such as the name of referring GP were correct. Part of the project involved writing a system to manage patient activity in 'real-time'.

Previously, we had managed contracts on a standalone system that relied on downloading data from the old PAS. Given the complexity of the contracts, we saw great benefit in being able to monitor activity and react quickly to extra-contractual referrals (ECRs) or to contracts likely to be exceeded by planned patient activity. The trust wanted to be able to get prompt authorisation from purchasers. It could also measure likely patient activity and income, based on the waiting list, allowing better planning.

Events in the PAS would trigger patient-activity to pass through a series of rules on contract allocations. Anything not meeting the criteria contained in these rules would be passed to a tracking file to be dealt with manually. So ECRs would end up in the tracking file for authorisation to be sought. Clinical coding would act as the final trigger, and at this stage the activity would be passed to the contract-management system.

Clinicians will be able to use the high quality data captured on CareLink in both research and clinical audit. Some existing clinical information systems will also be linked to allow a shared resource for managerial and clinical purposes.

Effective contract management was the most difficult thing to implement and highlighted several issues. In any custom development there must be an effective way to find out users' needs and record them simply. Written specifications face a gap between what the user expects and what the programmer understands.

A close working relationship between software development and the user is important, even planning review stages while writing the program, so that users may correct misunderstandings early, thus keeping down costs.

With terminals in use on wards for the roll-out of admissions, discharges and transfers, we piloted service-requesting and reporting starting with portering, ECG and therapies. It was largely a one-way process, with the wards requesting services. Before the end of this year, St Mary's intends to have a full order-communications system for radiology and pathology.

Robust procedures between medical professionals are essential. For example, would nurses be able to request the services of physiotherapy and dietetics, and what do the professional codes of conduct say about this?

Then came the next challenge. MDIS had developed an interface with the suppliers of St Mary's radiology system, Risformation. At first, radiology service requesting and reporting was piloted on one ward, and then extended to five. Again, strict procedures were necessary.

We are now conducting a pilot of the requesting and reporting of clinical chemistry tests. After going live, results came back within four hours.

An integrated hospital information system not only gives clear operational benefits, but also provides a resource of information for general use. But it is not without its difficulties and there are some important lessons:

- Choose a partner, not only a supplier. It is almost impossible to foresee all of the problems when a large system is installed.
- Make sure the relationship between your main supplier and subcontractors is fully developed, with responsibilities clearly understood. When several suppliers are involved, an already complex project becomes even more so.
- Involve the users at all possible stages and encourage them to implement the system to meet their needs. Staff champions are priceless, and a lead clinician and nurse are invaluable when the system goes on to the wards.
- Carry out first-class training and keep in touch with users by monitoring their daily work and the quality of the data they record.
- Make sure your supplier has a clear way to record user needs. A clear understanding on software quality is also needed.
- Keep the project goals clear.

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