

IMPROVING CLINICAL ACCESS AND QUALITY OF PATIENT CARE

A Case of Integration

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Abstract: Health care systems face increasing challenges to meet the sophistications of 21st Century medicine, not least the current fragmentation of patient information. Electronic Health Records (EHR) provide an opportunity to optimise clinical workflow and improve patient outcome. Trusts across the UK face the need to implement systems that will work smoothly with existing legacy systems, but will also bridge the gap to future central IT implementation systems. Using a case study this paper presents the challenges faced by UK Trusts to implement systems that work with existing legacy software to optimise information already retained and future information input.

1 INTRODUCTION

Within Europe, health systems face an increasing demand for services that are highly sophisticated to cope with complex clinical issues, yet have limited resources for implementation. Electronic Health Records (EHR) have the potential to optimise clinical workflow and to overcome the fragmentation that is common within and between healthcare institutions. The advantages of electronic health records are many and include increasing medications safety, improving clinical efficacy and optimisation of support of a team-based approach to health care (Chaudhry et al. 2006; Car et al. 2008).

Technological approaches taken in other sectors are difficult to apply to the healthcare arena for a range of reasons including:

- Complexity of healthcare organisations (Braithwaite et al. 2009).
- A high degree of autonomy within healthcare institutions which typically operate within a hierarchical structure (Gillies et al. 2001; Jadad et al. 2004; Braithwaite J et al. 2005)
- The fact that clinical tasks are highly specialised and are typically non-linear in flow (Westbrook et al. 2007; Braithwaite et al. 2005).

However, effective and safe patient care depends upon horizontal work co-ordination, particularly strong collaborations between professional groups. Effective inter-professional and organisational communication is therefore vital (Borrill et al. 2000).

However, it is clear that many healthcare trusts already operate a range of clinical workflow legacy systems. For optimum cost efficacy there is a need for new operating systems to integrate existing parameters and build upon them to provide Trusts with the best IT infrastructure outcomes.

2 IMPLEMENTATION OF EHR IN NORTHUMBRIA – A CASE STUDY

Northumbria Healthcare NHS Foundation Trust based in North West England is the largest geographical healthcare trust in England and one of the largest healthcare employers in the North East, with over 6,000 staff working in 10 hospitals throughout Northumberland and North Tyneside. Northumbria serves a population of half a million people. The Trust manages three general hospitals in North Tyneside, Wansbeck and Hexham and seven community hospitals situated in Berwick, Alnwick,

Rothbury, Haltwhistle, Blyth, Morpeth and Wallsend. Northumbria Healthcare NHS Foundation Trust has had Foundation Trust status since August 2006 and this has enabled the Trust to have greater control to respond to the needs of the local community. This Trust remains fully integrated within the NHS being inspected by the Healthcare Commission and overseen by the independent regulator, Monitor. Governors represent the eight constituencies the Trust covers and the public are invited to become members of the Trust.

Northumbria Healthcare NHS Foundation Trust identified a need to rejuvenate their clinical workflow systems, in order to mitigate duplication of records and ensure patient demographic information was complete, accurate and consistent in the Trust's major clinical systems, improving patient care and operating efficiency. Having implemented a series of 'best of breed' stand-alone applications it was recognised that whilst these provide critical clinical information they lacked a unique patient identifier leading to duplication of records and possible inaccuracies (Figure 1). As a result there was a decline in clinical confidence in electronic systems and an increasing reliance on paper records. Any system implemented needed to build upon existing applications already implemented and in use at the Trust and create a foundation to enable new and replacement systems to be integrated/interoperable.

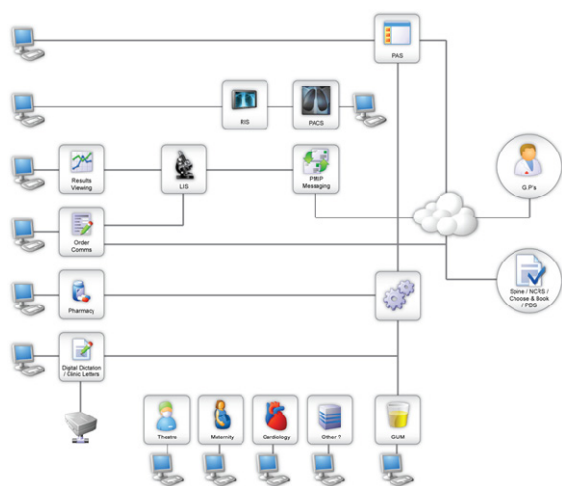


Figure 1: Schematic of clinical workflow systems within Northumbria prior to implementation of Rhapsody™ and Concerto™.

An effective four phase strategy has been undertaken in order to meet these needs. Phase 1, consisting of two parts, explored the remit of integration and data quality, to provide a fully

integrated IT landscape to support the Trust's information strategy and to identify and rectify issues with data quality apparent within the Trust's current systems. Phase 2 was to implement a unified single view of each patient's record including all data from relevant sources. And Phase 3 was to develop and provide clinical enhancements to future-proof the system and optimise clinical utility and is ongoing.

3 PHASE 1: INTEGRATION & DATA QUALITY

Phase 1a: integration

The objective of Phase 1a was to provide a fully-integrated IT landscape to support the Trust's information strategy as well as providing a basis for improved data quality and integrity. The scope of this phase was to convert all current integration to the new platform – Orion Health's Rhapsody™ Integration Engine between McKesson PAS and laboratories, radiology, maternity, theatres, cardiology and order communications. The McKesson PAS does not expose the requisite messages as standard to provide available access to Admission, Transfer and Discharge (ADT) information in the form of HL7 or other formatted messages, so it was agreed that McKesson's Interface Manager should be implemented in order to provide the ADT feed from PAS to Rhapsody. Such an approach was recommended and implemented because of opportunities for a fast and manageable transition with limited risk and good cost efficacy. Existing interfaces were replaced with G2 Digital dictation and Ascribe Pharmacy. Training was provided to Trust stakeholders so further interfaces could be developed as needed within the Trust itself.

Phase 1b: data quality

Using the interfaces developed in Phase 1a it was possible to interrogate the system and identify and resolve data quality issues as Rhapsody assures data quality once an interface goes live. To explore data quality, interfaces from Phase 1a were used to populate Orion Health's Concerto™ Enterprise Master Patient Index (cEMPI). EMPI stores a range of patient demographic information and allows an unlimited number of each item type to be associated against each patient, for example names, sex, date of birth, identifiers etc. Running the cEMPI provided a

report of actual or potential duplicates that were then resolved in McKesson PAS. Whilst this resolution was achieved manually in PAS, all further updates were subsequently automated to all other systems using the interfaces developed in Phase 1a providing those systems accepted Patient Demographic Update and Merge messages.

The EMPI was vital for data cleansing but was also used with a view to enforcing new business processes, to ensure that data quality was not degraded by lack of adherence to correct processes. cEMPI use was extended to the live environment to highlight the presence of duplicates and provide a means to resolve those duplicates every time a provider attempted to search for a patient when using the portal.

4 PHASE 2: UNIFIED VIEW

The aim of Phase 2 was to implement a single, composite view of a patient record consisting of data from all relevant sources focusing initially on those systems that delivered the most clinical benefit. The scope of this phase was to present data from, and provide single-click access to: patient administration systems, pathology, radiology, PACS, digital dictation and discharge summaries. Phase 2 was implemented using Orion Health's Concerto™ Medical Application Portal using the Rapid Deployment Edition so that a rapid implementation focusing on the major systems of the Trust could be achieved. Concerto was developed to work with legacy systems within the Trust, and to integrate with the Trusts current SSO solution, so that dynamic patient summaries were obtainable using information from a range of existing systems including: McKesson PAS, Anglia ICE Result Viewing (current and past databases), HSS Cris Radiology Information System, Agfa PACS, G2/SIRIS documents and Immediate Discharge.

The observed benefits of Phase 2 were improved user clinical engagement as well as improvements in efficiency and clinic time. The value of existing systems was enhanced and patient's safety and confidentiality improved.

5 PHASE 3: CLINICAL ENHANCEMENTS

The objective of Phase 3 is to implement additional clinical modules that will improve the use of data within the hospital and drive process improvement.

These include Recurrent Admission Patient Alerts (RAPA), Clinical Whiteboards for A&E and outpatient departments and Infection Control and Bed Management (ICBM).

RAPA is a unified alerting system that alerts care workers when any patient from an identified cohort presents in emergency care. In providing these alerts the Trust can significantly improve the quality of care provided and also reduce unnecessary emergency admissions. It is being implemented within Northumbria for cancer patients, those terminal patients who have requested to die at home and patients with identified chronic obstructive pulmonary disease (COPD).

Orion Health's Clinical Whiteboards™ will provide a user-friendly interactive solution for providing real time visual information regarding a patient's status in relation to their progress along a clinical pathway. Information can be both physical in terms of location and also clinical in terms of status of clinical processes, such as status of tests or orders.

Concerto contains a solution for ICBM and provides real time graphical representations of patients, their locations and status updates on expected discharge and infection status, enabling hospital staff to recognise and respond appropriately to specific patient situations.

Phase 3 is due to initiate in late 2010.

6 CONCLUSIONS

The NHS National Programme for IT is still ongoing and is not due for completion for several years. As a result there is a need for Trusts to implement systems that will meet their needs for coherent patient information both now and in the future; services that provide good value for money and are consistent with emerging central Government strategy for the NHS. Although Northumbria is still in the implementation phase of the project in many facilities, the Concerto Portal and Rhapsody Integration Engine solutions are already delivering benefits in terms of accuracy, time and cost and as a result will provide a good bridge to any services that are delivered centrally in the future.

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