INFORMATION SHARING IN NHS POLYCLINICS

Completed Research Paper

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Abstract

Under the previous UK government (1997-2010), one key health initiative was the combining of a range of healthcare services (eg. GPs, diagnostics, minor surgery, pharmacies) in a shared space called a ‘Polyclinic’. However, to benefit from this arrangement involves sharing confidential patient data across diverse IT systems. The findings indicate that although there cannot be a ‘one solution fits all’ model, it is possible for Polyclinics to effectively share information. However, there are a number of challenges to this. These include ensuring common standards for data exchange, interoperability, and technical barriers within existing GP practice systems, political resistance, lack of top down drivers to influence change in approach locally, funding, patient confidentiality, the need to respond to changes in government and finally stimulating a willingness at local level to change working practices.

Keywords: Polyclinics, information sharing,
Introduction

Polyclinics are a new way for people in the UK to receive healthcare. Polyclinics aim to bring services such as General Practice (GP) surgeries, diagnostics, minor surgery and pharmacies under one roof (Department of Health 2007). The term ‘Polyclinic’ has been applied to a number of different models (Dixon 2008). In some, the defining feature is the co-location of a range of specialties. In others, the Polyclinic is not a physical entity but an organizing principle in which services on several sites join together using new technologies and ways of working (‘virtual’ Polyclinics) (Imison et al. 2008). GP practices will be based at Polyclinics, but the range of services – from pharmacy and social care to staying healthy services and dentistry, from outpatient appointments and diagnostics to mental health services and antenatal care – will far exceed that of most existing GP practices (Imison et al. 2008).

The first seven Polyclinics in London opened in April 2009 with the aim of providing faster, more convenient, high-quality health services for patients (Healthcare for London 2009). These seven Polyclinics were the first wave of Polyclinic services aimed at improving access to primary care medical services through enhanced and additional GP service provision and more integrated health and social care services. Polyclinics are open for a minimum of 12 hours a day 7 days a week and will also provide unscheduled care. This is particularly important as A&E attendances are predicted to increase by 60% in the next ten years unless access to local services is improved. In a Polyclinic, people in London can get prompt attention for minor injuries and illness, and access many of the healthcare services available at hospitals (Edwards 2008).

The Polyclinics that are currently open are in areas which really need to benefit from additional healthcare such as Hounslow, Lambeth, and Harrow. The aim was to open more Polyclinics in the coming years to give more people in London a faster, more convenient and higher quality health service, though this is likely to change as governments change.

Polyclinics can contain any number of GP, community and other services, and are commonly seen as supported by ‘polysystems’ (“Polysystem is the term used to describe a joined up approach to delivering care in the community as opposed to within acute hospital settings. The polysystem includes all the people and organisations who can support a patient in the community at every stage of their health journey. In addition to NHS services a polysystem can include services provided by the local authority and other bodies including those in the voluntary, and private, sectors”). Figure 1 illustrates the interdependencies between co-located services to support delivery of Polysystem goals including access, value for money, patient experience and clinical quality. Polysystems are the people, services and organizations who support a patient’s care pathway within a community and provide a joined up and efficient approach to delivering care. The term Polyclinic typically refers to the “hub”, the building where the majority of services are based. The core hub services will need to reflect the needs of the local population and will be commissioned through clinical commissioning functions aligned to the polysystem (Edwards 2008).

The four key aims of Polysystems are to:

- Reduce use of Accident and Emergency (A&E) attendances and provide access to appropriate urgent care in the community. Approximately 50% of A&E attendees would be better treated in primary care, integrated with planned care services.
- Improve management of long term conditions – identifying high risk patients in the population and reduce number of hospital admissions from acute exacerbations.
- Consolidate and integrate primary care across a 50,000 – 80,000 person population and risk stratify that population.
- Re-design services across traditional boundaries of primary, community and secondary care to deliver an integrated service in the community. This is not just about moving from hospital into community, the service must be fundamentally different.

1 http://www.londoncouncils.gov.uk/services/datasharelondon/casestudies/glossary.htm
The four Polysystem goals rely heavily upon IT and information as an enabler to capture data at the point of care and provide it to the appropriate care professional in a timely manner. In order to do this it is essential that both administrative and clinical data can be shared across service and organizational boundaries. Therefore this paper aims to compare and contrast how patient information sharing happens between different IT systems implemented within an existing and a new NHS London Polyclinic.

Figure 1. Service Ladder – Core Offering for Polysystems (Commissioning Support for London, www.csl.nhs.uk 2010)

Background Literature

Information sharing within the public sector

Sharing of information is broadly speaking about creating not just the technological systems, but also the mechanisms and processes that enable organizations to cooperate and collaborate, by the giving and receiving of information. This might involve organizations changing and compromising on specific aspects, in order to be able to interact with another organization, but on the assumption that there is an overall benefit to be had. Information sharing within the public sector offers a real opportunity to share databases and make decisions based on more complete information (Dawes 1996). The types of benefits seen from such interactions typically include productivity gains, better decision making, reduced overheads, increased returns and generally greater integration of services.

Benefits and Barriers

The benefits of, and barriers to, information-sharing projects can be classified into three major categories: technical, organizational, and political (Dawes 1996).
Table 1 presents the comparative set of benefits and barriers associated with each information-sharing category. What is clear is that none of the three elements shown alone can explain the issues involved in these complex scenarios, but taking the combination and balance of issues into account will provide much better insights.

### Patient information sharing within the NHS

Modernizing Britain was a central theme of the new Labour Government’s program when elected in May 1997. Crucial to that objective was the drive to modernize the National Health Service (NHS), with the aim of “giving the people of this country the best system of healthcare in the world”. A modern and dependable NHS needs accurate and instantly accessible information. This is vital for improving care for patients, for improving the performance of the NHS, and the health of the nation (NHS Executive 1998).

The importance of good quality, clinically-relevant patient data in the National Health Service cannot be underestimated. Data and information can be said to underpin all aspects of patient care; from records containing a patient’s medical history, to details of a hospital’s (or indeed a clinician’s) procedure outcomes (Bellamy and Charles 2003).
The importance of collecting information about patients, their diagnoses, treatment, and outcomes has increasingly become a major area of interest in the professional, political and public domain over the last decade. The development of a single Electronic Health Record (EHR), one for each patient in the UK containing their entire medical history, is described in detail within an excellent text which proclaims as its title "The NHS IT Project - the largest computer programme in the world...ever" (Brennan 2005). However, there has been much debate over the efficacy of the HER, and even its scaled down sibling, the Summary Care Record (SCR) (Greenhalgh et al. 2010, Greenhalgh et al. 2008).

Over the last seven years, the UK Department of Health and the UK General Medical Council have led a re-interpretation of patient confidentiality requirements and the common law of confidence, in particular. It is now clear that, subject to certain exclusions, any confidential information about a person cannot be shared without that person’s consent, and that the NHS cannot continue to infer the consent of patients without offering patients a mechanism for expressing dissent and preventing information sharing. Implied consent is particularly difficult to justify when it involves sharing confidential patient information outside the NHS, because patients are less likely to expect, and may be more concerned about, such information sharing (DH/IPU/Patient Confidentiality 2003).

In 2005 the National Programme for Information Technology in England (NPfIT) was established, led by Connecting for Health (http://www.connectingforhealth.nhs.uk/), the informatics arm of the Department of Health (Department of Health 2002). It aimed to provide secure, nationally integrated electronic records as part of a wider political vision (Currie and Guah, 2006). In its 13 year administration (1997-2010), the UK Labour government pursued policies aimed at modernizing public services (increasing efficiency, accountability, transparency, and orientation to the needs of the service user), and large scale information systems, which would integrate services and support choice by empowered citizens, were viewed as a key vehicle for achieving this goal (Wanless 2002). However, the viewpoint inherent within NPfIT, and expressed by Connecting for Health, were not without significant dissent, especially around the area of confidentiality (Anderson and Walport, 2010, Anderson 2008, Thick et al. 2008).

A series of policy documents in 1998-2008 sought to centralize control over specification, procurement, resource management, and delivery of information systems (Greenhalgh et al. 2010). A summary of the development of the theory and implementation of an integrated Electronic Health Record (EHR) over recent years aids in highlighting the background to, and increasing importance of, information collection and usage within the NHS as a whole (see Figure 2) (Avison and Young 2007; Brennan 2005; Burns 1998; Guah and Currie 2007; Johnson 2009; Vidler and Clarke 2005; Wainwright and Waring 2000).

Figure 2. Timeline of Electronic Health Records (EHR) Sept 1998-March 2007
The underlying system that makes the EHR possible is the national data spine. The spine, delivered by ‘Connecting for Health’ (CfH), aims to integrate IT systems and services for the UK National Health Service and to ensure care is centered on the patient. It aims to connect over 100,000 doctors, 380,000 nurses and 50,000 other health professionals and give patients access to their personal health and care information. CfH has developed a number of projects related to improving the use of IT within the NHS. The spine was developed to provide a commonly accessible patient based resource, making information from multiple sources available to all those with a legitimate care relationship to the patient. This includes all health professionals whether they work in a hospital, in primary care or in community service. The spine (or TMS Transaction and Messaging Spine) addresses the sharing of EHR information, by creating an electronic highway by acting as a master "router" of all messages between systems. The spine consists of the following major components: SDS Spine Directory Services - provides various Directory Services (e.g. organizational details of GP practices), SDS excludes patient related demographics; PDS Personal Demographics Services - provides a National Service holding all personal, demographic and related information for each patient; NCR National Care Record - holds a summary of clinical and associated information. Note: NCR was formerly known as the NHS Care Record (NCR), the Personal Spine Information Service (PSIS) and Integrated Care Record Service (ICRS); LRS Legitimate Relationship Service - controls what access a healthcare professional has to a person’s clinical data (Commissioning Support for London 2010).

The Spine, run by BT under a contract worth £620m, went live in January 2006. It is a national, central database where summary patient records are stored and where, once fully implemented, local records will automatically upload important information to the summary patient record. The spine supports a wide range of services that are critical to the day-to-day smooth running of the healthcare system. They include:

- Access Control – A state of the art Access Control Framework (ACF) registers and authenticates all users.
- Transaction Messaging Service – The spine routes all messages between accredited IT systems. It supports services such as electronic booking. More than 20 million messages are handled each month.
- Spine Directory Services – The spine provides directory services, key to the security of access to information.
- Personal Demographics Service – Providing a central and single source for patient demographic information, the spine can record details such as NHS number, name, address and date of birth.

Other key applications supported by the spine include the payment by results service and the electronic prescription service. Overall the spine is meeting its objectives to (Greenhalgh et al. 2008):

- store personal characteristics of patients, such as demographic information
- store summarized clinical information which may be important for the patient's future treatment and care, such as allergies, visits to A&E and adverse reactions to drugs
- ensure the security of systems required to restrict access to the national and local systems
- provide a secondary uses service, using anonymised data for business reports and statistics for research and planning purposes
- interface with all the local IT systems within the National Programme.

However, as with all programs of this type, there are serious concerns expressed about both the whole and various aspects, at the individual and institutional levels (for example, see Currie, 2009).

**Healthcare information systems**

Information technology (IT) is no longer perceived as just a supporting tool, but has become a strategic necessity for developing an integrated healthcare IT infrastructure that can improve services and reduce medical errors (LeRouge et al. 2007). Correspondingly, IT investments in the health sector have increased dramatically and are expected to rise further over the coming years, but with mixed results (Currie and Guah, 2007). There are a range of possible problems, that face healthcare organizations and the question is how well IS researchers are equipped to tackle these (Chiasson et al. 2007; Wilson and Lankton 2004).
For example, using IT to improve healthcare processes quality and cut medical errors; identify and develop e-services to link healthcare stakeholders, such as government, insurance organizations, healthcare administrators, clinical staff, and patients; identifying barriers to acceptance and ongoing use of healthcare IS; amending user-centered design principles to healthcare settings; evaluating economic and other organizational impacts of IT in healthcare; and successfully managing healthcare IS (LeRouge et al. 2007).

**NHS IT systems within a Polyclinic setting**

NHS London is the Strategic Health Authority (SHA) for the Greater London area and provides strategic leadership for the capital’s healthcare to ensure staff and services deliver the best possible care and support for the public and patients. NHS London has overall responsibility for the performance of 31 primary care trusts (PCTs), 21 acute trusts, three mental health trusts and the London Ambulance Service. As part of NHS London, the London Programme for IT (LPfIT) has overall responsibility for upgrading NHS information technology to make it possible for hospitals, community services, mental health trusts, GPs and social care to share electronic patient records across the capital (http://www.london.nhs.uk/lpfit). LPfIT works with its Local Service Provider, BT, to provide care record systems to acute, community and mental health trusts and provide integration capabilities to enable the sharing of information.

The NPfIT program has successfully deployed RiO (CSE Healthcare Systems’ electronic patient record system) as the solution for the majority of community and mental health services in London (Bruce 2010, Gold 2011b) and is making progress with Cerner (Gold 2011a) to supply it’s Cerner Millenium EHR system to support Acute Trusts. This work has provided a more consistent benchmark for these services to record clinical and administrative information securely with links to National demographics services (PDS) and to the recently introduced (albeit rather equivocally) Summary Care Record (SCR). EMIS (Egton Medical Information Systems’s EHR) and Vision (INPS’s clinical EHR system) cover the majority of GP practice systems in London and the EMIS and Vision products have been delivered independently and through the GP Systems of Choice (GPSOC Programme).

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Figure 3. Schematic model of NHSCRS. CDSS, computerised decision support system; Prescribing, electronic prescribing; GP systems, general practice systems; NHS CRS, NHS Care Record Service; NHS DCR, NHS Detailed Care Record; NHS SCR, NHS Summary Care Record; PACS, Picture Archiving and Communication System (Cresswell and Sheikh, 2009)

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2 http://www.connectingforhealth.nhs.uk/systemsandservices/gpsupport/gpsoc
Both EMIS and Vision are in the process of deploying their web-based products EMIS Web and Vision 360. PCTs look for certain attributes in a system to ensure that information is shared effectively between different systems and service providers.

Some of the complexity in the technological infrastructures being introduced across the UK health sector can be seen in the NHS Care Record Service (CRS) as the ‘flagship’ electronic health record in hospitals in Figure 3 (Cresswell and Sheikh, 2009). Drawing on various aspects of literature, the challenges for patient information sharing between different IT systems in Polyclinics falls into three categories: technical, organizational, and political. Given the range of issues discussed above, this paper will now use two short case studies to explore these challenges.

Research Methodology

Research design and methods

Much debate exists currently in the literature as to the appropriateness, validity and reliability of so called ‘quantitative’ versus ‘qualitative’ methodologies. Simply put, the terms ‘quantitative’ and ‘qualitative’ refer to the type of data generated in the research process. Quantitative research produces data in the form of numbers while qualitative research tends to produce data that are stated in prose or textual forms. Quantitative methods vary from surveys, questionnaires, simulation to theory and hypothesis testing while Qualitative methods vary from semi-structured questionnaires to open-ended ad hoc conversations (Oates, 2006). It is appropriate to use the qualitative research approach in this study because it acknowledges that institutional behavior is attributable to social, cultural and contextual factors and not on proof of hypotheses formulated with data gathered from a small sample.

From an epistemological position, positivist research generally attempts to test theory in an attempt to increase the predictive understanding of phenomena. Interpretive research generally attempts to understand phenomena through the meanings that people assign to them. Critical research is seen as being one of social critique, whereby the restrictive and alienating conditions of the status quo are brought to light (Walsham 1993). Due to the nature of the research question, an interpretive approach will be adopted for the purpose of this research. Research is interpretive if it is assumed that our knowledge of reality is gained only through social constructions such as language, consciousness, shared meanings, documents and other artifacts. In information systems, interpretive research is “aimed at producing an understanding of the context of the information system and the process whereby the information system influences and is influenced by its context” (Walsham 1993). Interpretive research often involves using qualitative methods from which to understand the data collected and analyzed during the research process. A key task in interpretive research is seeking meaning; therefore the subject matter must be set in its social and historical context so the reader can see how the current situation emerged (Myers 1999).

Based on interpretive principles, the primary data collection was via face-to-face interviews, due to considerations of sampling and the richness of information required for this study. The research was conducted at Sutton and Merton PCT and Westminster PCT. Following a preliminary meeting with the ICT project manager for Polyclinic implementation at Sutton and Merton PCT, and head of Polyclinic implementation at Westminster PCT, the researcher was invited to make a formal application to conduct research at both PCT’s. Once the research was approved by the research and ethics committee a formal invitation was sent to both participants asking them to take part in the study. The face-to-face semi-structured interview allowed the research progression to shape hypotheses and syntheses during the study, using a loose framework of questions/topic areas to be addressed (Oates 2005). During the interviews the order of questions changed on a number of occasions depending on the flow of the conversation between the researcher and the participant. Interviews are time consuming and as expected within any busy NHS organization, it is not always convenient for senior staff to be interviewed to the interviewers preferred dates and times. A number of meetings had to be rearranged to fit in with the interviewee’s diary commitments. There were a total of four interviews with each interviewee being interviewed twice over a two week period. Each interview lasted between 1 to 2 hours, though on one occasion the interview did overrun by almost 1 hour.
Data analysis

For the analysis of the semi-structured interviews, three phases of coding were used: open coding, axial coding, and selective coding (Holloway and Wheeler 2010). Open coding is the process of breaking down and conceptualizing the data. The data gathered in the interviews was broken down into small chunks of text and potentially useful concepts were coded line by line. The concepts were then named. This process was repeated again and again and as Strauss and Corbin (1990) suggest, this is the process of fragmenting data into conceptual components. The next step involved defragmenting the text. Coding examples of all concepts were pulled together with thoughts on how each concept might be related to larger, more inclusive concepts – called categories. The final step involved looking at just the core codes, or selective coding.

Research Findings

Background to Sutton and Merton and Westminster Polyclinics

NHS Sutton and Merton is committed to improving the health and well-being of residents in the two boroughs and for all patients registered with its GPs. This commitment is underpinned by a clear vision for the future commissioning and provision of healthcare services. It therefore has proposed to open the Wallington Polyclinic or now known as the Wallington Local Care Centre (LCC). The £13 million development has now started and is proposed to become operational at the end of January 2012. The new LCC would be available for all local people who currently have to travel to hospital for routine treatment: The new building will have three times as much space for additional services including minor procedures, outpatient clinics and diagnostic clinics (e.g. X-Rays), which are currently only provided in local hospitals. It will also provide a pharmacy, community mental health services, and an expanded dental clinic. In December 2009, NHS Westminster opened the Victoria Polyclinic in Pimlico, London, with 17 services, including podiatry, sexual health and mental health.

Discussing the Data

Building on the literature and the findings, the challenges for patient information sharing between different IT systems in Polyclinics falls into three categories: technical, organizational, and political. There were numerous technical challenges that both Polyclinics faced while implementing their IT systems.

Technical challenges for patient information sharing

There are a number of IT systems being used across Polyclinics to date including RiO Community, RiO Mental Health, EMIS, INPS Vision, Adastra, etc. The high prevalence of RiO, EMIS and INPS Vision across London within primary and community services led Sutton and Merton PCT to concentrate their efforts on information sharing between these systems so any solution could potentially be applied to all Polyclinics across London. Sutton and Merton believed in a “one solution to fit all” model instead of a “rip and replace” model, i.e. finding a solution that could work with many IT systems, rather than take out everything and replace it with a new ‘solution’. Sutton and Merton were particularly interested in looking at how information between current core systems could be shared effectively. The project manager for Sutton and Merton commented on a ‘one solution to fit all model’, “Though it’s ideal to have a one solution to fit all model it’s not really possible to implement in present economic conditions. For example in a hospital different clinical systems capture different data from such departments such as cardiology and dermatologist. Sharing this data amongst these departments can be very difficult to achieve.” He also explained that GP’s are also not good at sharing data, “They often don’t want to make all the data available which thereby then makes its very difficult to find what you are after.”

The same question posed to NHS Westminster also produced a similar answer, “It is not possible to have a one solution to fit model. Information sharing within Westminster is challenging due to the number of different systems in use. There are around 20 GP systems in scope. There is a wide mix of systems within
the Polyclinic including TPP, I-soft, EMIS and Vision. Community staff with the Polyclinic use RiO, Podiatry uses another specialist therapy system”.

Figure 4 illustrates a generic Polyclinic infrastructure. A typical “Polyclinic” will normally have one or more GP practices, community health services, support and potentially social care, mental health and diagnostic services, depending upon the needs of the local area. As a result, the typical systems within a “Polyclinic” are EMIS and/or INPS Vision, RiO CH as a minimum. In addition, many out of hours services within London use the Adastra application. Within the ‘Polysystem’ i.e. the hub and the spoke practices, there are many more GP practices that will be referring into the “Polyclinic”, pharmacies, diagnostic services, mental health services, and social care services etc., all with their core systems.

The goal is to support local innovation and make best use of existing systems and solutions to:
- drive forward IT enabled information sharing within a Polysystem
- to evaluate the solutions, and;
- to share the experiences and lessons across London to assist with local decisions on information sharing.

Figure 4. Generic Polyclinic infrastructure (Adapted from NHS London 2010)
Using IT Systems in Sutton and Merton

At present the delivery of patient care in separate acute, community and primary care settings relies on systems which operate in silos with very limited exchange of patient data between systems. During the interview, the project manager for Sutton and Merton expressed the importance of sharing services, but using different systems, “To enable care providers working out of the Sutton and Merton Polyclinic and their local health economies to deliver coordinated care to the local population they will require secure, timely and appropriate access to relevant service user level data from the full range of care settings across the care pathways. Within the Polyclinic and their local health economies there will also need to be a range of common services, such as service user appointment booking, which are integrated with the care providers’ operational systems to enable the efficient scheduling of care. Commissioning consortia and other stakeholders, including Local Authorities and whichever organisation becomes responsible for the management of the Polyclinic, will require access to integrated management information to support effective care planning, the efficient use of the facilities within the Polyclinic, commissioning and public health initiatives”.

The outline view of the components of the solution which is required to support the operation of the Sutton and Merton Polyclinic is illustrated in Figure 5 below:

![Figure 5. Outline solution for the Sutton and Merton Polyclinic (Adapted from NHS Sutton and Merton 2010)](image)

Using IT Systems in Westminster

In June 2009, NHS Westminster, together with NHS Waltham Forest, were selected to pilot information sharing through a joint LPfIT (London Programme for IT) and CSL (Commissioning Support for
London's initiative. The pilot involved NHS Westminster undertaking an Information Sharing pilot to share clinical data between GP Practices and unscheduled care settings. The solution would enable clinicians in unscheduled care settings and the out of hours service to have appropriate access to a GP record and in turn send a discharge summary back to the patient's GP. The solution will also enable Community Health staff access to the GP record to provide them with a richer and longitudinal view of the patient record to better manage patients with complex needs. The Information Sharing Pilot was set up by CSL and NHS London to address three key challenges identified through consultation with PCTs. These were:

- How to deliver integrated booking to support a single reception for all services in the Polyclinic hub
- How to provide a view of the patient’s medical record in the Hub to support Urgent Care and Long Term Conditions
- How to collect and provide rich and robust commissioning data on Polysystem activity

The pilot involved four GP practices, two using EMIS LV systems and two using INPS Vision 3 systems. Each practice would enable a small number of dummy and real patient records, who have consented for their records to be shared, to be streamed through to the web-based instances of the GP solutions; EMIS Web and Vision 360 respectively. The Adastra application, used by the London Central and West (LCW) Unscheduled Care Collaborative already shows patients’ Summary Care Record (SCR) where consent is given. For the pilot, it would be upgraded to also show the GP record for that patient. This will present staff with a much richer view of the patient’s record with longitudinal information such as blood pressure and referral history where this is required, over and above the summary level data provided within the SCR.

The information that will be visible in the Adastra application for the purposes of the pilot was based on the configuration being used in the Electronic Patient Record in Wales (through Wales’ Informing Healthcare Programme) where a similar solution has been implemented. The record will include Patient’s name, address and contact details, current medication, repeat medication, medical history, allergies or contra-indications, current problems or diagnosis, test results (haematology, biochemistry, microbiology), examination findings, blood pressure, ECG, GP encounters, referrals/admissions, operations and vaccinations/immunizations. The decision was made to exclude information that could be considered sensitive and as such, the records will not contain information on: family history, social history, obstetric procedures, alcohol, exercise and diet, cervical cytology, contraception and chronic disease monitoring. The messaging flows can be seen in Figure 6 below.

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3 “Following the consultation regarding the future of CSL, the organisation was closed on 31 March 2011” (http://www.london.nhs.uk/news-and-health-issues/news/organisational-news/csl-is-closed).
Key principles of IT strategy for Polyclinic integration

Bringing together a range of ideas about technical solutions for Polyclinics, the key principles of IT strategy for Polyclinic integration has a number of components which include:

- **Platform** – provide an infrastructure platform that is robust, resilient, flexible, scalable and fit-for-purpose from a performance perspective;
- **Products and Services** – design, develop, deliver and support informatics products and services that meet customer requirements and exceed customer expectations;
- **Security and Accessibility** – design, develop and implement solutions that are accessible to all relevant stakeholders, from both a functional and data perspective, and also secure enabling only relevant and agreed access; (Xiao et al. 2010)
- **Replicability** – develop a solution and implementation approach which can be replicated to meet the needs of all and other multi-disciplinary care settings within NHS Sutton and Merton without significant modification;
- **Flexibility** – develop a solution and implementation approach which are sufficiently flexible to meet the needs of other multi-disciplinary care settings across the remainder of the sector, NHS London and the remainder of the NHS;
- **Value for Money** – maximize the return on investment in the solution through supporting effective and efficient working practices and managing the realization of benefits that the solution enables;
- **Stakeholders** – build excellent working relationships and deliver high levels of customer satisfaction to both internal and external stakeholders;
- **Innovation** – make use of innovative approaches and applications to design, develop and deliver the solution;
- **Patient centered** – define the “business requirements” from a patient perspective across patient pathways and not from an organizational perspective;
- **Clinically Led** – drive the solution design from a clinical perspective and meet management information needs from the underlying database that this implies;
- **Governance** – adhere to agreed and robust information governance arrangements across all stakeholders.

Organizational challenges for patient information sharing

Benefits

It transpired from both interviews that the benefits in implementing a shared information solution across a Polyclinic were very similar. The key benefits for both Polyclinics included cost savings, improved access to data, improved communication between clinicians, ability to meet targets, time savings, and greater patient satisfaction.

In terms of access to clinical data, “clinicians will be able to access relevant patient data in urgent care settings enabling the correct care. The Polyclinic model would offer general practitioners greater access to diagnostic services. Hence, Polyclinics can act as a one-stop shop for patients with the most common medical and surgical problems, offering the possibility that a problem can be dealt with in just one or two visits to a Polyclinic, instead of through several different appointments with primary care clinicians, diagnostic services, and specialist hospital clinicians” (ICT Project manager for Sutton & Merton PCT). This can be related to improved ‘Access’ to services, as seen in the core offering for Polysystems (see Figure 1).
In terms of improved communication between clinicians, “patient information held in GP systems can be shared with appropriate clinical staff in other areas as well as discharge summaries being sent back to the GP. The wider range of services which may become more readily available due to sharing of resources (such as physiotherapy, interpreting services, counsellors, mental health workers, and employment and benefits advisers) could also improve the choice of services available to patients. For example if you look at a child with very complex needs and disabilities, they will need to see a number of different specialists within the NHS. Any kind of online booking system that helps avoid the laborious process of ringing different departments, arranging confirmation, and juggling three different consultants at once is where we want to see things moved to” (Head of Polyclinic implementation for Westminster PCT). This can be related to improved ‘Patient Experience’ of their care, as seen in the core offering for Polysystems (see Figure 1).

With respect to time savings, “staff will have up-to-date access to information and be able to transfer information instantly. Also reduced treatment time for service users. There is also the potential to co-locate specialist clinicians with general practitioners, with potential benefits for integration of care and better communication between specialists and generalists. This would mean overcoming one of the main limitations of current NHS services” (ICT Project manager for Sutton & Merton PCT). This can be related to improved ‘Clinical Quality’ care and care services, as seen in the core offering for Polysystems (see Figure 1).

In terms of their ability to meet targets, “access to information allows target to be met and for staff to spend more time in patient care and less on administration of patient notes etc.” (ICT Project manager for Sutton & Merton PCT). While for greater patient satisfaction, it appears that “patient details will be available to appropriate staff allowing for more accurate diagnosis and personal care” (ICT Project manager for Sutton & Merton PCT). This can be related to improved ‘Patient Experience’ of their care and ‘Value for Money’, as seen in the core offering for Polysystems (see Figure 1).

In terms of lower costs, “The administrative costs of operating the building are minimised as everything is located in one building rather than a number of buildings. This can also allow increased clinic hours on evenings and weekends beyond the conventional general practice opening hours and could make access to medical care easier for those in employment” (Head of Polyclinic implementation for Westminster PCT). In addition, for financial control, “The volume of clinical work delivered through the Polyclinic ensures that the assumptions made in the financial model for the Polyclinic are met” (Head of Polyclinic implementation for Westminster PCT). This can be related to improved ‘Value for Money’, as seen in the core offering for Polysystems (see Figure 1).

**Risks**

However a number of risks were also raised during both interviews. For Sutton and Merton, some of these risks were with the use of kiosks, which they planned to introduce to support and make more efficient patient arrivals. The list below identifies the risks associated with the kiosks:

Regarding data collection, “A key challenge for Trusts is capturing information which is not often routinely asked e.g. ethnicity and religion. The kiosks offer patients the opportunity to update this data. However, this is often not happening as once patients are presented with their information on the kiosk they can move onto the next screen without filling in the gaps in their record. To amend this, the workflow would need to prompt users to update any gaps in their record” (Head of Polyclinic implementation for Westminster PCT). Another risk is around the level of clarity in data collection, “It might be unclear for patients why the Trust is asking/recording some information e.g. sexuality (this was actually taken out for the NHS Waltham Forest workflow). Information may need to be on-hand to explain why this information is being collected and how it is used” (ICT Project manager for Sutton & Merton PCT).

Another common concern is privacy, “The kiosk screens and the information on them is easily visible. Trusts should look at how privacy and data protection can be maintained e.g. putting up a barrier between kiosks, introducing a “queue here” line or simply positioning the kiosks where they can’t be overlooked” (ICT Project manager for Sutton & Merton PCT).

Another issue noted was around signage, “Once a patient has been checked in, the kiosk can provide directions to a waiting area. For this, locations need to be clear and generic e.g. not “turn left and go up
the stairs”, but “1st floor, waiting room A” to enable patients to easily locate their waiting room. Trusts may find that their signage needs to be updated to assist with this” (ICT Project manager for Sutton & Merton PCT). Finally, there is the issue of manned kiosks, “The use of kiosks tends to increase when someone is “manning” the kiosks i.e. directing them to the kiosks – drawing the attention of available kiosks to patients as well as helping if there are any issues. This needs to be an internal decision but should factor into any cost/benefit analysis if this is planned on an ongoing basis” (ICT Project manager for Sutton & Merton PCT).

PCT documents set out ‘efficiency savings’ required of them by the department of health that reveal proposals to decommission hospital services on a massive scale, with many introducing new ways of working for GPs under tighter managerial control. The introduction of Polyclinics will affect how trusts plan annual cuts, “trusts are planning annual cuts in hospital activity of as much as 10%, with whole departments to be closed and some to transfer millions of pounds of work to primary care”. (ICT Project manager for Sutton & Merton PCT)

This also has an effect on staffing, “in London, the SHA is putting PCT managers under pressure to close hospitals against their will and shift work to GPs” (ICT Project manager for Sutton & Merton PCT).

**Political challenges for patient information sharing**

The previous Labour government was responsible for Polyclinics and a one size fits all IT solution. However due to changes in the UK government in 2010, the incoming health secretary revealed plans to halt NHS London’s IT-dependent service reconfiguration and Polyclinics, as well as cutting costs by a third over four years. The intention was to get rid of a “one-size fits all approach” and move towards the reorganization of NHS services. A top-down, one-size fits all approach, is to be replaced with the devolution of responsibility to clinicians and the public, with an improved focus on quality and be centred on a sound evidence base, support from GP commissioners and strengthened arrangements for public and patient engagement, including local authorities (Commissioning Support for London, 2010)

The project manager for Sutton and Merton stated, “Dropping the plans will have a significant impact on IT in the capital’s health services. The NHS had been wrong in the past to insist on the same systems for everyone and try to drive through a standard one size fits all solution. There is a challenge for both the NHS and suppliers as to what the IT for Polyclinics may look like”.

The 2010 NHS white paper (Secretary of State for Health 2010), outlines plans to make information more accessible which impacts on how patient identifiable data can be shared. A downsizing of the health service and subsequent increased input from the private sector leads to questions about transfer of patient data outside of state run organizations and subsequent issues of guarantees of security and consent.

**Concluding Discussion**

There is no, and is unlikely to be in the near future, a “one solution fits all” which caters for the needs of the wide breadth of services (e.g. primary and secondary care, social care etc.) that are within a typical Polyclinic. Based on the findings in the study there are a number of challenges to successful patient information sharing between different healthcare IT systems in order to deliver Polyclinics. The key challenges are ensuring common standards for data exchange, interoperability, and technical barriers within existing GP practice systems, dealing with political resistance, lack of top down drivers to influence change in approach locally, funding, patient confidentiality, the need to respond to changes in government and finally stimulating a willingness at local level to change working practices. A small part of what is achievable by meeting these challenges has or will be demonstrated as part of the Westminster and Sutton and Merton clinics. However, further development is required to expand these in order to meet their full potential.

There are a significant number of technological systems in operation within health and social care in London which deliver specialist functionality to support services and there are many levels of information sharing which need to be catered for. Consequently, the ability to share information between disparate systems becomes a priority and with it, the importance of agreeing open standards which can be adopted by suppliers to enable information sharing. These need to be agreed at a national level as far as possible to
avoid the necessity for system suppliers to create multiple interfaces to support local information sharing and instead to concentrate on improving functionality.

In the UK, GPs have a strong and growing power base within the healthcare system. Simply attempting to influence and coerce them to change their practice may be insufficient to instigate homogenous and wide reaching change. Instead, stronger leadership from the higher echelons of state may be required to ensure conformity to a common approach and enforce the alteration to working practice necessary to provide consistent data exchange and cross-organization partnership working.

There has been a well-publicized program attempting ambitious and wide reaching change to IT within the NHS. Continued funding is required to deliver change and ensure fit for purpose IT systems are in place to underpin information exchange. Existing IT systems will not support the latest government information revolution proposal, as published in July 2010. The new proposal plans to make NHS records available for patients to share online could fail due to lack of funding and interoperability between legacy IT systems and formats (and has since July 2010 been ‘paused’ by the present UK government). Improving NHS IT while the NHS is under huge financial pressure will be extremely challenging as IT is often one of the first areas to be scaled down during times of financial difficulty.

There are also concerns around patient confidentiality. It is essential that the NHS takes every step to maintain patient confidentiality. There are proposals in place for patients to be able to access their own medical records, and share their contents with third parties as they see fit, both for medical and legal purposes and with unspecified third parties who may analyze and present information to patients in a way they might more easily understand. This aims to give patients the knowledge they require to take a bigger role in making decisions about how, where and by whom they are treated, and allow them to rate the quality of care they receive (and so improve the patient experience/satisfaction). Doctors and other medical staff will also be able to collect more information at the point of care and add it to patient records. However without proper data security safeguards such as encryption and authentication tools, the confidential information held in online patient records will be vulnerable to loss and unauthorized access.

Through discussion with the Polyclinics during the study, there was often a temptation to “rip and replace” existing technology with a single system. As Polysystems grow to include more services, this is unlikely to be sustainable and could create dependencies upon a single supplier. The Sutton and Merton and Westminster pilots have demonstrated the potential for interoperability between multiple systems.

The Sutton and Merton Polyclinic, although focusing on the implementation of kiosks to support patient arrivals, has a more important purpose in terms of demonstrating the benefits of a common set of messaging standards. The Interoperability Toolkit (ITK - a set of national standards, frameworks and implementation guides to support interoperability within local organizations and across local health communities) could be applied very effectively to the full administrative clerical data set and therefore the interoperability of core systems to maximize the benefit of co-location. Through the messaging and the functionality offered by a Shared Reception Solution, Sutton and Merton will be able to make best use of administrative resources and will have the option to streamline their central and local reception staff. Patient experience will be improved as a shared reception will have access to appointments across the Polysystem, check them in and/or provide information then and there, directing them as necessary rather than simply sign-posting them to the local reception.

Westminster has demonstrated a different set of message standards for a clinical dataset within their proof of concept. The benefits of sharing this information are significant and support the Polysystem model of care. As more services are moved out of hospitals and closer to homes, the need for Polysystems to engage proactively with patients with long term conditions will increase and with it, the need for a richer, historical data set. For example, Adastra provides a “Detailed Patient Record Viewer” within the core system of those providing unscheduled and urgent care. Both Polyclinics have highlighted the importance of a common set of standards to maximize the benefit of co-location. Primary care systems are fundamental to the future of Polysystems and interoperability has to be available across all to be effective.

The findings from this study reinforce the view that with better information sharing, comes the ability to make better decisions (Dawes 1996). The benefits identified can be classified as technical, organizational

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4 http://www.connectingforhealth.nhs.uk/systemsandservices/interop
and political, with the main benefits seen as improved access to clinical data, improved communication, time savings, greater ability to meet targets and lower overall costs. However, these benefits also come with some risks, such as maintaining good data collection while ensuring patient privacy.

Since beginning the study there has also been a change in Government and a significant alteration of policy with regard to healthcare, including significantly, the abolition of Polyclinics. Further UK government plans for healthcare reconfiguration make recommendations for improvement to IT systems subject to these external pressures, and may limit what can be realized in terms of benefits (Gil-Garcia et al. 2007)

Information sharing is a challenge for both public and private organizations. For example, collaborative e-Government initiatives require multiple organizations, including government agencies, private companies, and non-profit organizations, to share important information and, in some cases, to integrate some of their business processes. Expected benefits are an important reason for starting collaborative initiatives. However, the perception of benefits is clearly affected by perceived impediments and prior experiences. From an applied perspective, managers from public and private concerns need to understand that not everyone will have the same expectations of a project's benefits. Managers should be aware of the relationship between impediments and benefits and attempt to improve the conditions responsible for impediments. From a research perspective, future models of IT success should incorporate both impediments and experience-based components as determinants of expected benefits. This approach will result in more granular models that will ultimately increase our understanding of the complexities of managing IT projects within the public sector, and in particular within national health services, such as the NHS.

References


