Successful linking of patient records between hospital services and general practice to facilitate integrated care in a hospital and health service in south-east Queensland

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Abstract. This brief paper describes a recent exercise undertaken within a hospital and health service in south-east Queensland to attempt to link patient records between general practice and hospital services. It describes the technical and governance processes undertaken to achieve this link and the challenges experienced to date in linking the two data sources.

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Introduction

In April 2014, a hospital and health service (HHS) in south-east Queensland, in partnership with their regional Medicare Local and local general practices, agreed to pursue a radical approach to delivering more coordinated care with a particular focus on high-risk medical patients. This strategy was developed into a full business case that received HHS board-level approval and significant funding from both State and Federal Government bodies whose policy makers were in support of the integrated care strategy.

It is difficult to envisage a successful approach to integrated care without the successful integration of the relevant clinical information. In particular, because one of the key success criteria of integrated strategies is their impact on hospital use, it is important to be able to identify those patients at higher risk of hospitalisation and target the resources of an integrated care strategy towards these patients.¹,² Taking inspiration from other leading international integrated systems (Kaiser Permanente, Geisinger Health System, Intermountain Healthcare, Canterbury Health), the HHS strategy was also predicated on a particular form of integration: that between general practitioners (GPs) and medical specialties. This was felt to be particularly important because the change hypothesis is to deliver holistic and person-centred care to patients in a high-risk population in an attempt to reduce the use (and therefore cost) and improve the quality of health care provision. The delivery of holistic and patient-centred care, in turn, requires the continuity of an approach and consistency in care planning between GPs and the medical consultants working in specialist teams within the hospital. Without this consistency, it is difficult to envisage the success of integrated care or even define what it might mean.

The governance challenges of integrating datasets between hospital services and general practice are formidable³ and, up to this point, has proved a stumbling block in better understanding patient care across primary and secondary healthcare.

Following several months of work in this area, it was clear that there was no route to the legal abstraction of identifiable patient data from general practice for purposes other than those specifically related to health care delivery. This is an ironclad fact of the legal and reimbursement framework that presently exists in the Australian healthcare system. Clinical data collected within general practice may only be used for direct care purposes within that practice and, as stipulated in consent arrangements, may only be shared with external parties when and where that party is providing healthcare services directly to the patient.

Reciprocally, there are stringent governance requirements for the management of patient-level and identifiable data from hospital services. The use of these datasets is permitted for care planning purposes, but only under the explicit approval of the relevant Senior Responsible Owner. In Queensland, up until July 2014, the Senior Responsible Owner was the Director General of the Department of Health for the State; however, since the creation of the Hospital and Health services under the 2011 Act,⁴ this authority is transferred to HHS executives.
Therefore, these constraints allow clinical data sharing between organisations but only where there is a joint responsibility to deliver health care services to an integrated care patient.

Participants

The integrated care program is a 3-year trial comprising of 14 general practices in the HHS catchment area. These 14 practices account for approximately 150,000 patients (~15% of the total HHS catchment). Within this intervention group, medical patients that are high users of the HHS’s two major hospitals will be the primary focus of the integrated care proof of concept. The predominant disease categories for patients being targeted are respiratory, cardiac, endocrinology and renal disease.

Objective

The key objective of the study was to identify a cohort of patients with joint responsibility of healthcare delivery that would benefit from integrated care as a means to improve the quality of healthcare provision between health care events that occur at the patient’s general practice and/or the hospital. Clinical data integration and analysis are critical to this process.

Currently, the capture of data about other health care service organisations that provide services to a patient within general practice information systems and/or within the hospital and health service is limited. Where information was collected, it was often incomplete and/or inconsistent. This meant that it was difficult to identify patients who used the services of the hospital and who were also receiving services provided by participating GPs in delivering integrated care.

Because of these constraints, a patient-matching exercise was undertaken between the HHS and 14 general practices within the HHS catchment area. The outcome was a detailed listing of hospital patients together with knowledge of which general practice at which they seek health care to better integrate health care delivery for these patients.

Methods

Sequence of events

Three years of patient demographic data related to hospital admissions and emergency presentations were extracted from relevant hospital systems and loaded onto a secured laptop. This information was handled by authorised and named officers within the HHS who were fully compliant with data privacy and confidentiality policies associated with handling identifiable patient data.

Because of general practice data constraints, the laptop was taken by HHS staff to the participating local general practice for the entire activity of patient matching where participating general practices reciprocated and provided a data extract of active patients (those with three or more consultations in 2 years) within the general practice database. Figure 1 provides a diagrammatic outline of the process of data integration for the trial.

HHS staff ran an algorithm to actively compare demographic data from both organisations using various demographic indicators, such as surname, given name, Medicare card number and date of birth. In most cases patients were matched quite simply, but some manual review of information was required by both parties to ensure that some patients were correctly identified.

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**Fig. 1.** Process of integration of hospital and health service (HHS) and general practice (GP) patient data. ED, emergency department; OP, out-patient; URN, unique record number.
For matched patients (i.e. those with a shared health care responsibility for the patient), coded disease information and current and past medication data were provided from the general practice to the HHS for the purposes of further cohort identification.

Unmatched patient data were discarded from this activity and all other information supplied by the general practice was returned and removed from the HHS equipment. The technical team went back into the hospital environment and linked matched patients with a more comprehensive utilisation dataset covering the same 3-year period that did not include intensive care unit (ICU) attends, codes, cost and revenue data.

**Results**

At the end of this matching process, the outcome was a dataset comprising of patient information with their unique reference number for hospital services of patients who had been admitted at least once and who were strongly associated with a specific general practice.

From the work done to date on integrating the patient records between the HHS and the participating general practice, up to 4500 of these patients (~3% of the 150 000 patients on the trial) were considered frequent users of the two main hospitals in the HHS. Using this information, it was now possible to query a defined population of patients associated with a particular general practice with regard to their history of utilisation, their known diagnoses and their respective costs of care.

By linking the records between the HHS and the general practice, it has been possible, for the first time, to attribute specific costs to specific patient cohorts attending specific general practices. In time, these data may be useful in developing a more comprehensive view of population utilisation and costs.

Finally, armed with this list of 'shared' patients, the team returned and was able to work with the general practice to discuss the resulting list and identify patients at risk of higher use of services or poor outcomes who may benefit from being part of the integrated care program.

**Discussion**

**Problems, conflicts and constraints**

The linking of HHS and general practice data, although successful, was not without its challenges. Problems with integrating patient data and correct information, particularly across different parts of the healthcare system, are well represented in the literature.\(^5\)\(^6\)\(^7\)\(^8\)\(^9\) Five key challenges to data integration have been identified to date in relation to project, namely:

1. Lack of accurate data collection of general practice or GP information within HHS systems upon entry to the hospital. This lack of admission information has required the necessity of taking HHS data to general practices to identify patients.
2. Lack of a unique identifier that could be used across general practice and hospital data. As a workaround, the technical team had to use a range of demographic information, including surname, given name, date of birth, gender and the Medicare card number, as a guide. This approach in itself was not foolproof because several patients appeared on multiple Medicare family cards, information was not always captured by the hospital and patients changed their surnames because of changes in marital status.
3. Because there is no requirement to have a single general practice health provider, it was found that some patients visited more than one practice and it was difficult to ascertain which was the most current or appropriate practice. In addition, some practices had multiple identifiers or files for a single patient.
4. Common language was a challenge to overcome. For example, there needed to be consensus on what constituted an ‘active patient’. From a general practice perspective, three or more visits in 2 years to a practice is considered an ‘active patient’. Some patients may have been overlooked if they aren’t considered ‘active’ from a general practice perspective but are high users of hospital services.

**Lessons learned**

Despite the data challenges, this iterative approach to developing a population risk profile has many benefits. First, it overcomes what, on the face of it, appeared to be insuperable governance constraints to achieving a consolidated image of clinical need in populations between general practice data and hospital data. Second, it richly involves GPs and their practices in the process of identifying clinical risk and uses practice intelligence as an important resource in the development of the population risk profile. Third, the exercise has enabled the integrated care program to anticipate the development of generalisable business rules for both the abstraction and management of general practice data, the abstraction and management of hospital data and their combination. It is believed these general rules will enable this approach to be fully automated in the future, delivering dynamic risk stratification for defined populations as understood between the information held about patients on general practice systems and within hospital records.

**Competing interests**

None declared.

**References**


