Facilitating Information Access across Healthcare Settings – A case study of the e-Shared Care Record View Project in Canterbury, New Zealand

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Yulong Gu
National Institute for Health Innovation, University of Auckland
261 Morrin Road, Auckland, New Zealand
h.gu@auckland.ac.nz

Gayl Humphrey
National Institute for Health Innovation, University of Auckland
261 Morrin Road, Auckland, New Zealand
g.humphrey@auckland.ac.nz

Jim Warren
Department of Computer Science, University of Auckland
261 Morrin Road, Auckland, New Zealand
jim@cs.auckland.ac.nz

Martin Wilson
Pegasus Health
160 Bealey Avenue, Christchurch, New Zealand
Martin.Wilson@pegasus.org.nz

Abstract

Accelerated by the situation created by the Canterbury earthquakes, the electronic Shared Care Record View (eSCRV) project aimed to allow healthcare providers across settings to access a patient’s medical records. Through this project, patient records sourced from hospital data repositories, general practice, community pharmacy and nursing facilities are made available to key healthcare providers within these facilities. A rapid and sustained technology uptake has been observed, with qualitative and anecdotal benefits reported by the users. The user-perceived benefits include addressing information gaps, improving care quality and safety, as well as enhancing planned and proactive care delivery. However, the eSCRV technology alone is not seen as the sole mechanism of change as discussions regarding the expectations on shared information and indeed on shared care continue. The rapid implementation and uptake of eSCRV demonstrate a successful case of integrating patient records and sharing information across healthcare organizations to improve care quality.

Keywords: Healthcare information systems, shared care, uptake, user interview, healthcare delivery

Introduction

Health information technologies (IT) have supported the capability for faster, more reliable and more transparent healthcare services; and have opened the door for more radically different care delivery models than what has been previously possible. Successful planning and implementation of health IT have been associated with better support for the design and delivery of high-quality healthcare, improved outcomes and patient safety, as well as further generating and supporting innovation in healthcare processes (Chaudhry et al. 2006; Finkelstein et al. 2012; Lau et al. 2010). The New Zealand (NZ) National
Health IT Plan has set a 2014 goal to make a core set of personal health information available electronically to patients and their treatment providers regardless of the setting where they access health services (Ministry of Health 2013a). The assumption being that a person’s clinical information collected across the continuum of services will be accessible to health professionals and patients themselves, to support treatment decision-making, reduce duplication, improve the patient care experience and concatenate care services where possible. The information available includes diagnoses, laboratory results and medications, collected within a number of settings from community to hospitals. Sharing this information across different healthcare organizations and with the patients themselves is seen as having the potential to support proactive patients and prepared clinicians that are described in Wagner’s chronic care model (Wagner et al. 1996). However, the information needs to be stored securely in clinical data repositories and needs to be viewed securely by authorized users.

Research Setting and Methods

The NZ Healthcare System

According to 2013 census, an estimated 4,242,048 people usually live in NZ (Statistics New Zealand 2014). The NZ health and disability system is mainly funded from general taxation, costing over NZ$14,655 billion in 2013/14 (Ministry of Health 2013b). District health boards (DHBs) are responsible for providing or funding the provision of most health services in their district under the governance of the Ministry of Health (Ministry of Health 2014). There are 20 DHBs in NZ, administering around three quarters of the country’s public health funding (Ministry of Health 2011). Primary healthcare services are delivered by general practices that are funded by DHBs. There is also a private healthcare sector providing secondary and tertiary specialist care. Overall, 77% of health expenditure is publically funded through taxes, 5% by private health insurance premiums, and less than 1% by non-profit organizations; the remainder (17%) is paid directly (as copayments) by those accessing and receiving the service (Statistics New Zealand 2010).

The Canterbury Earthquakes and the electronic Shared Care Record View Project

The NZ Canterbury region includes a large central portion of the East Coast of the South Island, centered around the city of Christchurch (New Zealand Tourism Guide 2014). The 2010 and 2011 Canterbury earthquakes presented many challenges for the 510,000 people in Canterbury, including significant disruption in the existing modes for delivering and accessing healthcare. A key issue was that many of the accepted and traditional means of information access were lost through extensive system disruption, destruction and in some cases the death of knowledge holders. While Canterbury had been on a journey of change over the past decade, the extent of the destruction created by the earthquakes catalyzed a rapid ramping-up of the timelines for these planned changes. The provision of an electronic Shared Care Record View (eSCRV) is one example where the timelines for implementation were hugely concatenated. The eSCRV project aimed to provide a secure mechanism for allowing key healthcare providers, across different organizations, to access patient medical information.

The short term emphasis of the eSCRV project is to operationalize a system that would provide relevant patient information from different sources to all health professionals at the point of care so that informed decisions could be made to support the delivery of safe quality healthcare treatment; in the long term, the hypothesis was that eSCRV would enable continued improvement in the quality of healthcare delivery, would make better use of the limited healthcare resources available and would support the continued availability of up to date healthcare information irrespective of where the service was being accessed and delivered (eSCRV Programme Team 2011). The eSCRV project covers the entire patient population of the region; however, patients can easily opt out and withhold their information if they choose not to participate (The State Services Commission 2012).

The patient records that are made available through the project include information about diagnosis, medication prescription and dispensing, lab results, visits to general practitioners (GPs) and hospitalizations. Sources of these data include electronic medical record (EMR) systems and other clinical data repositories based at Canterbury District Health Board (CDHB), e.g., CDHB’s Health Connect South system, at individual general practices, community pharmacies, as well as at Nurse Maude facilities (which is a community-based nursing service provider).
Facilitating Information Access – eSCRV Case Study

Research Design

The National Institute for Health Innovation (NIHI) was commissioned by the CDHB and Pegasus Health Care (a primary healthcare organisation) in 2013 to complete an evaluation of the eSCRV project. Applying the established NIHI health IT evaluation framework (Warren et al. 2011), both quantitative and qualitative data were collect and analyzed, which indicated a rapid uptake of the project and a good level of perceived benefits across the user community (Humphrey and Gu 2014). Using the data collected in the evaluation, this paper presents eSCRV as a case study to understand the potential benefits of sharing information across healthcare organizations and to learn from the project implementation experience.

Drawing upon recommendations from recent health information system (IS) studies, such as capturing stakeholder views (Greenhalgh and Russell 2010), taking a multi-method socio-technical approach (Westbrook et al. 2007) and assessing a range of benefits (Lau et al. 2007) (Lau’s framework was developed based on DeLone and McLean’s IS success model (DeLone and McLean 2003)), both qualitative and quantitative data are included in this analysis. Between October 2013 and January 2014, interviews with seventeen participants were undertaken to understand stakeholder perspectives and experience with the eSCRV project. These participants represent a wide range of project stakeholders coming from hospitals, primary care (including metro and rural clinics), the 24-hour surgery, pharmacies (in community and hospital), specialist and community nursing facilities. Interpretivist philosophy was applied in the interview data analysis taking a general inductive analysis approach (Thomas 2006). Constant comparison was undertaken in this analysis between different groups of stakeholders (by role) and within the same group. The key emerging themes are also triangulated with other sources of data, including the quantitative findings such as system uptake and impact. Data saturation was achieved in the collection and analysis of the qualitative data.

The quantitative data were extracted from eSCRV and other clinical systems by the decision support teams of Pegasus Health and CDHB. The data were anonymized before transferring to NIHI researchers via secure and password-protected network/media. Descriptive analysis method was used to assess eSCRV system access activities by clinicians, particularly the access to a few key information pages, such as community pharmacy dispensing records, GP prescriptions, laboratory tests and other DHB patient information such as discharge letters and some clinical notes. These “pages” were suggested by the project team and the interview participants as key information sources to which the access may have made some impact on decision making and on the care delivery for patients by health providers in various setting.

Results and Discussion

Small Rapid Implementation Cycles Created a Sense of Early Successes

The eSCRV project goal was expansive but the implementation approach taken, said one informant, was “not to aim for a big bang or perfection before starting.” Rapid cycles of development, implementation and refinement were agreed as the best approach to creating the momentum for success. It was believed by eSCRV sponsors that by having initial quick wins, peoples’ enthusiasm would be generated and that their learnings would be used to continue to inform the project as it continued to be implemented and expand (eSCRV Programme Team 2013).

Over the course of 2011, a rapid process of design, development and implementation planning began. Governance groups were established, followed by consultation cycles, privacy impact assessments, vendor discussions, technical development, defining initial access and audit criteria, and communication planning. The scale of effort that happened during these eleven months “was substantial,” commented one informant, who went on to contextualize this by saying that all this went on in the post-earthquake environment when “our whole system was in a state of chaos.”

As shown in Table 1, the community pharmacy dispensing data and the DHB Health Connect South (hospital data) were the first two data sets selected for sharing within eSCRV. This was both a pragmatic decision and a strategic one. Having access to good medication information was a key driver for hospital clinicians, while access to patient hospital information was key for primary care clinicians. The difficulty in accessing timely patient information about hospital events was clearly articulated by one GP interviewed, “access to the full picture of a patient under my care [before eSCRV was] somewhat limited
due to the lack of easy or any or, should I say, more timely access to the hospital side of the
information.” As such creating the mechanism with which primary care clinicians could have access to the
DHB clinical information was “a no-brainer.”

<table>
<thead>
<tr>
<th>Data source system</th>
<th>Key data components available via eSCRV / Health Connect South system</th>
<th>Accessibility timeline by settings (when the data became visible for most participants)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GP EMR system (MedTech32)</td>
<td>Demographics&lt;br&gt;Diagnosis&lt;br&gt;Allergies + warnings&lt;br&gt;Prescribed medications&lt;br&gt;Inbox list&lt;br&gt;Screening (weight + blood pressure)&lt;br&gt;Last record entry date&lt;sup&gt;‡&lt;/sup&gt;</td>
<td>Always&lt;br&gt;Sep/2013&lt;br&gt;Sep/2013&lt;br&gt;Sep/2013</td>
</tr>
<tr>
<td>CDHB EMR and other clinical data repositories such as Éclair laboratory result database</td>
<td>Demographics&lt;br&gt;Last contact&lt;br&gt;Other contacts (x2)&lt;br&gt;Encounter list&lt;br&gt;Future appointments&lt;br&gt;Planned admissions&lt;br&gt;Clinical notes&lt;br&gt;Medications&lt;br&gt;Imported (older correspondence)&lt;br&gt;Biochemistry and haematology results&lt;br&gt;Electrocardiography (ECG)&lt;br&gt;Laboratory results&lt;br&gt;Radiology results&lt;br&gt;Referrals&lt;br&gt;Care plans</td>
<td>Dec/2012&lt;br&gt;Always&lt;br&gt;Feb/2012&lt;br&gt;Dec/2012</td>
</tr>
<tr>
<td>Community pharmacy EMR</td>
<td>Dispensed medications</td>
<td>Dec/2012&lt;br&gt;Feb/2012&lt;br&gt;Always&lt;br&gt;Feb/2012</td>
</tr>
<tr>
<td>Nurse Maude EMR</td>
<td>Diagnosis&lt;br&gt;Referrals&lt;br&gt;Allocations&lt;br&gt;Outcome</td>
<td>Sep/2013&lt;br&gt;Sep/2013&lt;br&gt;Sep/2013&lt;br&gt;Always</td>
</tr>
</tbody>
</table>

* Despite the data being available, not all data are visible to all users. Access was confined through the creation and application of a role-based access matrix and associated rules for use. This was developed through a process of examining current data access rules, undertaking consultation and providing leadership by the project governance group.

† A regional provider of community nursing, home support and related services (Nurse Maude 2014).

‡ This may reflect date of an appointment or date of a phone call or date with a note saying unable to contact.

Table 1. Key data components and the project roll-out timeline
At the hospital end, unable to access primary care consultation data was seen as an “information gap for them, especially for people with long term conditions.” However, making this type of primary care data available was challenging as the data are not housed in a single repository and are often unstructured. The task required significant technical work “not to mention engagement with primary care clinicians.” None of these issues was new, but what became obvious post-earthquake and during the eSCRV project’s rapid consultation processes was that resolving some of these issues as quickly as possible would create a significant sense of success for the project and would gather momentum for the wider goal of a fully shared information system.

By December 2012 a substantial proportion of the 510,000 Canterbury people had their secondary care information viewable (after consent) by their primary care provider and their dispensing data viewable to both primary and secondary providers. As summarized by a GP, “by creating the early successes, the next steps are never as hard because the value chain is slowly being shown. Plus when those initial worries are not realized, trust in the system is reinforced and this can mean the next decision is not so hard.”

### Rapid and Substantial Technology Uptake

By 30 Sep 2013, access activities by 2665 individual users were recorded in the eSCRV logs. Table 2 summarizes the number and proportion of users (by role) who have ever accessed eSCRV records that are considered “external” to the user’s core EMR system for sourcing information. For instance, we did not measure access by hospital users of hospital data (although the data might be included in eSCRV).

<table>
<thead>
<tr>
<th>Users roles</th>
<th>Data sources</th>
<th>Primary care # (%)</th>
<th>Hospital * # (%)</th>
<th>Lab results * # (%)</th>
<th>Community pharmacy # (%)</th>
<th>Nurse Maude # (%)</th>
<th>Total Users #</th>
</tr>
</thead>
<tbody>
<tr>
<td>GP</td>
<td></td>
<td>43 (11%)</td>
<td>389 (98%)</td>
<td>354 (90%)</td>
<td>181 (46%)</td>
<td>12 (3%)</td>
<td>395</td>
</tr>
<tr>
<td>General practice nurse</td>
<td></td>
<td>8 (3%)</td>
<td>279 (98%)</td>
<td>241 (85%)</td>
<td>63 (22%)</td>
<td>1 (0%)</td>
<td>285</td>
</tr>
<tr>
<td>General practice support staff</td>
<td></td>
<td>0 (0%)</td>
<td>72 (100%)</td>
<td>1 (1%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>72</td>
</tr>
<tr>
<td>CDHB agency nursing staff</td>
<td></td>
<td>0 (0%)</td>
<td>/</td>
<td>/</td>
<td>13 (93%)</td>
<td>1 (7%)</td>
<td>14</td>
</tr>
<tr>
<td>CDHB diabetes clinicians</td>
<td></td>
<td>19 (51%)</td>
<td>/</td>
<td>/</td>
<td>36 (97%)</td>
<td>8 (22%)</td>
<td>37</td>
</tr>
<tr>
<td>Other CDHB full-time clinical staff e.g., consultants, nurses</td>
<td></td>
<td>344 (30%)</td>
<td>/</td>
<td>/</td>
<td>1133 (98%)</td>
<td>108 (9%)</td>
<td>1152</td>
</tr>
<tr>
<td>CDHB intern staff</td>
<td></td>
<td>0 (0%)</td>
<td>/</td>
<td>/</td>
<td>72 (100%)</td>
<td>7 (10%)</td>
<td>72</td>
</tr>
<tr>
<td>CDHB lab &amp; radiology technicians</td>
<td></td>
<td>2 (1%)</td>
<td>/</td>
<td>/</td>
<td>177 (100%)</td>
<td>33 (19%)</td>
<td>177</td>
</tr>
<tr>
<td>CDHB managers and administrators</td>
<td></td>
<td>1 (6%)</td>
<td>/</td>
<td>/</td>
<td>14 (88%)</td>
<td>7 (44%)</td>
<td>16</td>
</tr>
<tr>
<td>CDHB mental health practitioner</td>
<td></td>
<td>0 (0%)</td>
<td>/</td>
<td>/</td>
<td>1 (100%)</td>
<td>0 (0%)</td>
<td>1</td>
</tr>
<tr>
<td>CDHB typist/clerical staff</td>
<td></td>
<td>0 (0%)</td>
<td>/</td>
<td>/</td>
<td>1 (100%)</td>
<td>0 (0%)</td>
<td>1</td>
</tr>
<tr>
<td>CDHB - User Support and Training Staff</td>
<td></td>
<td>0 (0%)</td>
<td>/</td>
<td>/</td>
<td>4 (100%)</td>
<td>0 (0%)</td>
<td>4</td>
</tr>
<tr>
<td>Community pharmacist</td>
<td></td>
<td>0 (0%)</td>
<td>353 (99%)</td>
<td>168 (47%)</td>
<td>244 (60%)</td>
<td>10 (3%)</td>
<td>355</td>
</tr>
<tr>
<td>Community pharmacy technician</td>
<td></td>
<td>0 (0%)</td>
<td>37 (100%)</td>
<td>1 (3%)</td>
<td>23 (62%)</td>
<td>0 (0%)</td>
<td>37</td>
</tr>
<tr>
<td>Nurse Maude - Allied health</td>
<td></td>
<td>0 (0%)</td>
<td>6 (100%)</td>
<td>0 (0%)</td>
<td>2 (33%)</td>
<td>0 (0%)</td>
<td>6</td>
</tr>
<tr>
<td>Nurse Maude – MD</td>
<td></td>
<td>1 (14%)</td>
<td>6 (86%)</td>
<td>5 (71%)</td>
<td>1 (14%)</td>
<td>2 (29%)</td>
<td>7</td>
</tr>
<tr>
<td>Nurse Maude – Nurse</td>
<td></td>
<td>6 (9%)</td>
<td>59 (92%)</td>
<td>46 (72%)</td>
<td>18 (28%)</td>
<td>5 (8%)</td>
<td>64</td>
</tr>
<tr>
<td>Nurse Maude – Nurse practitioner</td>
<td></td>
<td>0 (0%)</td>
<td>11 (92%)</td>
<td>4 (33%)</td>
<td>7 (58%)</td>
<td>2 (17%)</td>
<td>12</td>
</tr>
<tr>
<td>Nurse Maude – Referral centre staff</td>
<td></td>
<td>0 (0%)</td>
<td>8 (100%)</td>
<td>2 (25%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>8</td>
</tr>
</tbody>
</table>
Table 2. The number of Christchurch users ever§ accessing eSCRV by clinical user groups

* Only the access by non-DHB users was examined in Table 2 (as DHB users had access to these data as part of their core business systems before the eSCRV project).
† There are 50 individuals who have two profiles/roles, e.g., “CDHB diabetes clinician” and “Nurse Maude nurse practitioner.” If a user has two clearly differentiated roles, their data-access activities were examined according to their role and setting separately.
§ The hospital data had been available, at least for some participants, for 2.75 years by 30/09/2013, 4 years for lab results data, almost 2 years for community pharmacy dispensing data, and less than 3 months for primary care and Nurse Maude data.

As shown in Table 2, clinicians outside DHB quickly began using eSCRV, particularly for viewing hospital information. The data in Table 2 also confirmed the qualitative findings in that timely access to patient hospital information had been the biggest gap identified for community-based clinicians, hence the large uptake in that sphere. Similarly, most of the DHB users reported the gap in medication information, and the results support that their use has been towards the community pharmacy dispensing data. This was reinforced by hospital-based pharmacists and technicians who, when interviewed, remarked that they use eSCRV almost daily, particularly for looking up community pharmacy dispensing data, e.g., to assist medication reconciliations. Interestingly, over half of the eSCRV community pharmacist users also viewed community dispensing data. This was explained by the interview participants in community pharmacies who remarked that having access to other pharmacists’ dispensing data meant, amongst other things, that they were able to quickly identify drug seekers.

Different system usage pattern by different user groups and seemingly distinct values of the technology were observed in each group. This suggests that the context (i.e. professional role) may have influenced the system usage pattern and the user perception of the system benefits. Since the eSCRV project was evolving and was rolled out not long before the study time, one interpretation is that the wider use of laboratory results and hospital data may be related to the fact that these data were more familiar as compared to primary care or Nurse Maude data. Nevertheless, by filling these gaps, other ideas for additional data to be shared were emerging. For instance, it was mentioned in the interviews that seeing prescribing data would be useful especially if someone had multiple healthcare providers prescribing. In late 2013, GP prescribing data became available and it is likely that future usage patterns and benefit perceptions of the technology will continue to evolve.

The qualitative data also highlighted that the eSCRV implementation strategy mandated no expectation of eSCRV use. From a project perspective, use was monitored only for privacy and security protection purposes. The philosophy was that it was important to have the system available first. According to one interviewee, “its use would grow through word of mouth and from the small success stories.” And these stories were communicated via the different community networks. This strategy appeared successful in that there was a rapid and substantial uptake. A total of 1,220 non-DHB users in Canterbury had accessed the hospital patient page (information on 52,023 patients) by the end of September 2013; 822 non-DHB users had accessed the CDHB lab result database via eSCRV for information on 189,757 tests (regarding 35,424 patients); and 1,990 users had accessed the community pharmacy dispensing records of 36,172 patients. Figures 1-3 track the viewing activities over time by user role and demonstrate substantial and sustained uptake of the system.
Facilitating Information Access – eSCRV Case Study

Figure 1. Access to Hospital Data over Time by Clinicians Outside DHB

Figure 2. Access to CDHB Laboratory Results over Time by Non-CDHB Users in Canterbury
Although the GP data (including prescriptions) and Nurse Maude data (including diagnoses) were only made available in the last quarter of 2013, an early indication of rapid uptake was observed with substantial access activities recorded. Information regarding 260 patients’ “Care Coordination Diagnoses” records (from Nurse Maude data) and 1102 patients’ GP data were viewed by 424 and 196 users, respectively (with the system live for no more than three months by the data extraction time). Accessing information across organizations was evidently achieved in the project; and its benefits were reflected by the participating stakeholders in interviews.

**User-perceived Benefits from Information Access**

Addressing the information needs in a timely fashion was one of the key themes that emerged from the interviews. For instance, qualitative feedback from primary care participants suggested that eSCRV effectively addressed one of their information gaps, that of, access to their patient’s hospital data. As stated by a GP, “just getting access to the hospital information was a huge step in closing the information gap. It was such a significant early win for eSCRV.” A Nurse Maude clinician also remarked that “just one click away, I looked [in eSCRV] and there was her [outpatient] appointment. So easy and yet it makes a huge difference in not wasting [mine, the patient, the hospitals] time.” The availability of laboratory test results is also frequently commended in the interviews; for instance, one Nurse Maude clinician commented “if you see a patient has had some tests done, you would not repeat them unnecessarily. In the past you would have had to ring the GP or hospital...then, find someone to get the information... then... make sure they have the result you are after ... then asking them to fax it to you... it was such a waste of time, and does nothing for patient trust.” It was not only non-DHBs users who praised eSCRV. The availability of community-sourced information is also appreciated. For example, the participating hospital pharmacy technicians reported that undertaking medication reconciliations has become more efficient with the community dispensing records becoming available via eSCRV.

A community-based pharmacist suggested that eSCRV also saved them time in unexpected ways; “I don’t get as many phone calls from the hospital anymore. Some days [in the past] I could get upwards of 20
calls a day. This can be so disruptive. So now, I even tell people if they ring, have you looked on eSCRV? I believe [eSCRV] saves hours now.” The added advantage, said another community pharmacist, was that the access to the dispensing records from all the other community pharmacies enables them to quickly identify for example, drug seekers. The availability of this richer information is reported to have facilitated better decision making which then supports the delivery of safe quality healthcare treatment. As described by one hospital clinician, “often people with LTCs [long term conditions] are on many medicines and eSCRV helps me to unpack exactly what they are on (Rx and dispensing), and it enables me to discuss with them what they are taking as I find often they don’t remember them all or the specific regimes. So this helps me to understand if they are feeling worse because they are not taking something or are taking it incorrectly. … helps us make safer conclusions and decisions.” A 24-hour surgery clinician also reinforced the belief that eSCRV helped improve quality and safety with an example of a person who arrived with chest pain. In eSCRV, “you can pull up the old one [ECG] and compare it with the one you have in your hand now. It has made a massive difference to our management of patients with chest pain….Because you can see this change is been there before so it reassures you, it reassures the patient, now. I can see if there is a change from before. I don’t need to send [the patient] to hospital where in the past if I am not sure if this is a new artefact [in the ECG] I would definitely send them to hospital to be safe. Now I can say it is nothing new don’t worry.”

The availability and access to the eSCRV information is also seen to enhance planned and proactive care delivery for some patients. One Nurse Maude specialist related a story that demonstrates its utility, “I get the referral and sometimes it is pretty brief …. This meant I would go into a person’s home fairly blind to who they are and anything that has gone on before. Now I can look [in eSCRV], get a sense of the situation and so when I visit the person I know much more and it helps build up the rapport. Especially when I can reflect on previous activity.”

A similar scenario for how eSCRV supported best practices was described by a nurse user, “Looking in eSCRV before I visit a client, helps fill in the blanks that a referral often doesn’t provide. I feel much more prepared.” Another case example was provided by a primary care physician, “a patient of mine with thyroid disease, the routine blood test showed a too low result yet he was on a significant dose. So instead of going …hmm, I will increase this and retest… I was able to look at his dispensing record which included, any other Rxs from other clinicians, e.g., specialist clinics. Then with some crude calculations I averaged out a daily dose which was 1/3 less than what I thought he was on. So instead of increasing this, the consultation was about the regime, strategies for consistently taking the medications, barriers that were there for him and so on. This is a better outcome for him, safer I think and we can make a quality plan to work through issues that are more relevant to his life not just his disease.”

Interrelated to user perception on the benefits of eSCRV, its usability was also commented on; for example, the users interviewed overall reported that eSCRV is simple to use and to navigate. And all participants’ comments indicated that eSCRV was seen as a success, although to varying degrees. While the comments illustrate that for some, eSCRV was having a tangible effect on decisions and care planning, others were not as convinced that eSCRV would result in notable impacts. One GP felt that “it [eSCRV] was a bit of a red herring and not a panacea for doing our jobs” and a hospital emergency department clinician remarked, “despite its promise, I haven’t really found it to be as useful as I had hoped.” While these perspectives represented a very small number of interview participants, it highlighted that value proposition for all stakeholders needs to be clear at the onset. And so that while one clinical realm may not have its needs met on day one, they can see the value and place their expectations along a timeline for when the project will add value for them.

The Need to Understand Shared Care Expectations and Impact

The eSCRV implementation strategy was clear in that the “selling point” was that eSCRV was not a new model of care that was going to require a whole new way of working with significant changes and disruptions. Early input from stakeholders in the early designing stages was that eSCRV was not going to require or make users fundamentally change the way they provided care. Furthermore, there were no mandate as to how, when or for whom eSCRV should/could be used. Use of eSCRV was at the discretion
of the user. This was seen as an exceedingly clever strategy with the users having created their own learning journey and generated real stories and value propositions that were used to reflect their own success, thus reinforcing a shared ownership of eSCRV. It appears evident that this approach created an environment for the success of eSCRV to be disseminated in ways and languages and styles that resonated with the various users (and potential users).

This does not mean it was all unchallenged. Some of the interviewees felt that discussions should have been facilitated regarding the expectations for achievement or success of shared information and indeed of shared care. A GP commented, “I am not convinced that there is any evidence that shared information makes any difference to care. I can't see myself using it [eSCRV] regularly.” An emergency department clinician also stated, “I thought I would use it a lot but at the moment it does not provide me with anything that would make a difference in my role.” On the other hand, information sharing is seen by some participants as critical in care delivery. As put by a Nurse Maude specialist, “communication and information is vital to provide effective care for patients. Not chasing information from my secondary colleagues, or them chasing me, must mean that we are all getting on with what we are here for – caring for our patients. Getting us all connected should be an essential priority for the DHB and the health sector overall.” The stakeholder experience suggests that it is important to take on both perspectives going forward. It was commented that the project should enable those who wish to use eSCRV to continue doing so. In the meanwhile, ongoing evaluations need to ascertain eSCRV impact, particularly on patient outcomes, clinician workflow and resource use. Findings from such evaluations should be disseminated among the stakeholders, should contribute to the body of evidence (that is currently relatively sparse), and should be used to inform the future direction of the project.

The NZ National Health IT Plan set the vision to utilize technologies in facilitating the collection and access of a person’s health information over a continuum of care across a range of healthcare settings (Ministry of Health 2013a). Therefore, developing the capacity to support secure sharing of key information, among healthcare professionals as well as with the patient themselves, is seen as essential to improve care quality and outcome. This capacity is aligned with the successful implementations of proven shared care models, particularly in the chronic care context such as Ed Wagner and colleagues’ Chronic Care Model (CCM). CCM is framed under the domains of decision support, delivery system design, self-management support, clinical information system, community linkages and the organization of care (Hedrick et al. 2003; Piatt et al. 2006; Vargas et al. 2007; Wagner et al. 1996; Wagner et al. 2005). The use of health IT is an empowering component in successful implementation of CCM. On the other hand, the approaches to shared care to date have not always been effective in terms of improving health outcomes (Malinowski and Adams 2009; Smith et al. 2008) or achieving significant cost savings (Liu et al. 2003; RAND Europe 2012; Von Korff et al. 1998). Acknowledging this debate and a need for evidence, the concept of eSCRV appears to have gained huge momentum with jurisdictions outside of Canterbury requesting eSCRV be enabled in their areas. Those stakeholders outside the current deployment jurisdiction all remarked that even without clear demonstrable and measurable evidence, the ability to see the various pockets of information “can only be positive”. The project has in fact been scheduled to expand across the South Island (Pegasus Health Ltd 2014). A patient portal providing patients with access to the eSCRV data is also being developed.

Conclusions

The Canterbury eSCRV project has delivered an electronically accessible view into key elements of patient records, which are sourced from multiple information systems including primary, secondary and community clinical data repositories. Through this view portal, clinicians, including specialists, GPs, pharmacists and nurses, can look into the multiplicity of data generated by the many healthcare touch points along a patient’s journey from one place, that is eSCRV The technology has enabled a shared information environment in which health professionals from different organizations are able to view relevant information about a patient at the point in time when they need to make a decision or develop a plan of care or follow up on an outcome. The eSCRV experience demonstrated a regional success in integrating patient records. And when integrated records are achieved, through a viewing portal in this case, they are well used.

The eSCRV has created an effective foundation for further support and innovation in the healthcare processes to enable improvement in outcomes. The rapidity of eSCRV deployment and the growing user
base plus the wider demand from other jurisdictions suggest that it is an important and effective tool in
the Canterbury’s connected health system vision. Furthermore, qualitative findings describe many
instances where access to eSCRV was seen as instrumental in a decision, a relationship or an action. The
user-perceived benefits include addressing information gaps, improving care quality and safety, as well as
enhancing planned and proactive care delivery. However, the eSCRV technology alone is not seen as the
sole mechanism of change.

The different system usage pattern by different user groups and seemingly distinct values of the
technology as seen by each group suggest that the context (professional role) has influenced the system
usage pattern and the user perception of the system benefits. An ongoing and wider discussion regarding
the expectations of shared information, and indeed of its influence on shared care, was identified.
Suggestions were also made regarding future studies to better understand the expectations and impact of
shared information and of shared care. A key limitation of the current study relates to the fact that it is
retrospective. Observation is limited to the current state in mid implementation. The lesson going
forward, and for wider health IT studies, is that there are many advantages to collecting baseline data
prior to implementation. This applies particularly to any attempt to carry out health outcome and impact
analyses and/or cost benefit analysis. Measurement of the assumptions of the goal should be integral to
an implementation plan. However, the rapid implementation and uptake of eSCRV to date demonstrate a
successful case of integrating patient records and sharing information across healthcare organizations to
improve care quality and safety.

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Ethics

The eSCRV evaluation protocol was assessed by the New Zealand Health and Disability Ethics Committee
(HDEC) on 09 October 2013; an exemption from HDEC review was allowed due to the nature of the study
being an audit (HDEC reference: 13/CEN/149).

References

Chaudhry, B., Wang, J., Wu, S., Maglione, M., Mojica, W., Roth, E., Morton, S.C., and Shekelle, P.G.
2006. "Systematic Review: Impact of Health Information Technology on Quality, Efficiency, and
Costs of Medical Care," Ann Intern Med (144:10), May 16, pp. 742-752.
eSCRV Programme Team. 2011. "Project Overview Document Cdhb," Canterbury District Health Board,
Christchurch, p. 4.
eSCRV Programme Team. 2013. "Email Communication."
Finkelstein, J., Knight, A., Marinopoulos, S., Gibbons, M.C., Berger, Z., Aboumatar, H., Wilson, R.F., Lau,
B.D., Sharma, R., and Bass, E.B. 2012. "Enabling Patient-Centered Care through Health Information
of Guiding Principles," Plos Medicine (7:11), Nov.
Hedrick, S.C., Chaney, E.F., Felker, B., Liu, C.F., Hasenberg, N., Heagerty, P., Buchanan, J., Bagala, R.,
Depression Treatment in Veterans' Affairs Primary Care," J Gen Intern Med (18:1), Jan, pp. 9-16.
District Health Board and Pegasus, Canterbury, p. 71.


