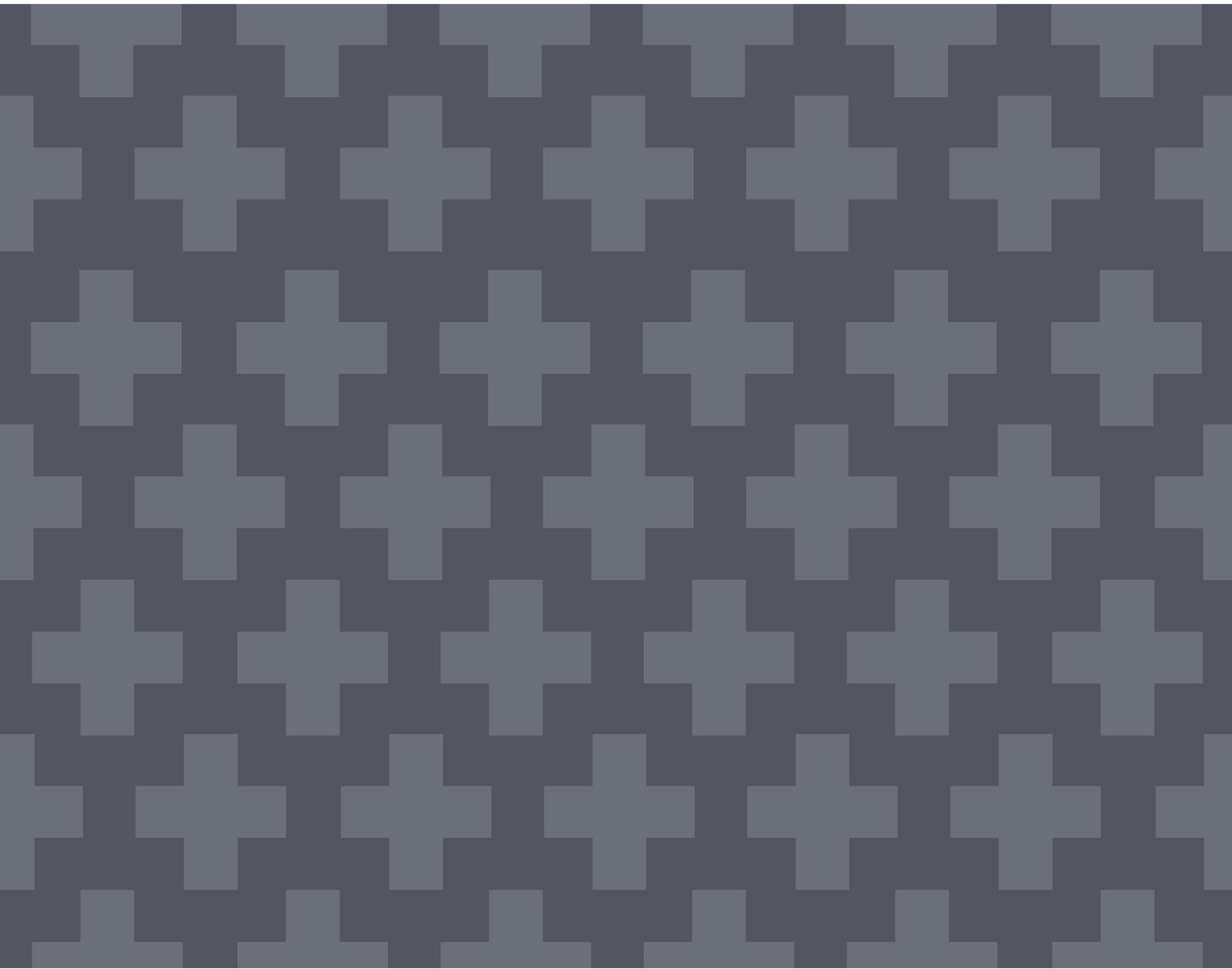


31 October to 3 November 2016
SKYCITY Auckland

PROCEEDINGS

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Scientific Papers

The HINZ conference is being held this year together with Nursing informatics New Zealand, Global Telehealth and Successes and failures in telehealth. In combination, this represents one of the largest healthcare informatics meetings in the Asia-pacific region. I hope you can get the most out of this opportunity to connect to people, hear the latest research and see practical solutions to real problems. Most of all I hope that you have the opportunity to consider exciting new ideas that can help you improve healthcare in New Zealand and around the world. My thanks to deputy-chair Koray Atalag, and those who kindly donated their time as scientific paper reviewers.

Dr Dave Parry

Chair of HiNZ Scientific Paper Programme Committee



THANK YOU TO THE HINZ 2016 SCIENTIFIC PAPER REVIEW COMMITTEE

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INFORMATION AND CLINICAL TECHNOLOGY CONVERGENCE: IS THE HEALTH WORKFORCE ALIGNED?

Jane ALLISON ¹

1. Haggerty & Associates, New Zealand

This paper examines literature that links slow progress with realising gains from IT-enabled information sharing and clinical technologies to difficulties with practice change among the health professions. Difficulties with interoperability between IT vendors and health service providers have been offered as explanations for limited slow progress with IT-enabled service improvement. Less attention has been paid to the way service improvement is shaped around specialist departments and by traditional workforce arrangements. The paper draws on a larger study that produced a framework for analysing tensions between service improvement policies and the organisation of work among the health professions.

The paper critically reviews literature that identifies clinical practice related difficulties in process improvement, adoption of IT-enabled information sharing and clinical technologies that involve three or more health professions. These illustrations indicate attention by health services to implementation success factors, including leadership, planning, clinician engagement, programme management and culture change. Despite this effort, difficulties are evident in relation to the separation of routine and complex work, inter-professional delegation and information sharing, standardisation of patient record-keeping, and deploying technologies and IT across specialist departments. There is a lack of leadership authority to support practice change involving new roles and career paths for health professionals. There are reasons to think these difficulties also limit the engagement of consumers in self-care.

In conclusion, a different approach is likely to be required for system-wide gains from IT-enabled service improvement. This includes a broader range of stakeholders, a focus on services involving routine work for chronic health conditions, and a governance structure that offers regulatory protection and support for the development of solutions. Health service organisations need to play a stronger leadership role through organisation-based policies and training to integrate technologies and enable innovative practice arrangements.

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IMPROVING INTEROPERABILITY AND TRUSTWORTHINESS OF HEALTHCARE DATA REPOSITORIES

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Several healthcare challenges suggest that increased collaboration could improve outcomes, both for individual patients and for organisational efficiency/effectiveness. Simultaneously, the volume and variety of data relevant to healthcare is increasing, in both mainstream activities and via emerging technologies. Monolithic data repositories seem increasingly impractical, particularly by comparison with a federated approach. However, federation highlights the need for improved understanding of trust, in terms of both data use/ownership and data quality/validity. This paper proposes a semantic model for relevant trust-based concepts, and introduces the Cell Platform as a reference implementation.

Significant volumes of data are currently shared between providers, contributing to multiple forms of improvement. Similarly, healthcare service organisations provide significant volumes of deidentified data to their funding partners, enabling improvements in terms of planning,

There is potential to gain additional benefit from sharing even more data with further parties, yet healthcare practitioners and their organisations are already struggling to meet existing data sharing requests. At the same time, emerging technologies have the potential to support collection of an even greater diversity and volume of data.

Personal attitudes towards healthcare are also changing. In particular, patients are increasingly informed and involved in their care plans, in turn increasing the requirement for access to underlying data, yet are increasingly concerned about privacy and related security provisions.

Combining all the above, requirements for future healthcare data management are likely to include increased volume and diversity. This paper suggests a federated approach, where multiple systems interoperate to meet overall requirements.

We believe that a key enabler of interoperability is clarification of "trust". This paper discusses key aspects of trust, proposes a semantic model for relevant trust-based concepts, and introduces a semantic repository technology capable of providing a reference implementation of those concepts. When present, trust can act as a powerful lubricant that sustains collaboration and leads to meaningful relationships, but its absence makes neither possible.

Trust between two agents develops through an ongoing process of maintaining shared understanding, and it correlates with the intensity and duration of maintaining shared understanding. Whilst trust is domain-specific, detected deception may reduce the trustworthiness of an agent across all domains.

Trust includes aspects that are intentional (i.e. reflect the intentions of the parties in the relationship), systemic (i.e. qualities of component systems, such as data architectures), and/or dynamic (i.e. develop with experience and time in relation to specific agents).

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PATIENT JOURNEY MODELLING: TRANSLATING POLICY INTO ACTION FOR INTEGRATED CARE

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3. Integrated Care, eHealth NSW, Australia

This article provides a practical solution for translating Ministry of Health policy directives into patient journey models that can drive implementation at an operational level. Clinical and managerial staff are included in the development of the models and as such broker agreement to the implementation environment prior to the action phase, thus overcoming a common historical improvement barrier. Integrated Care - a fundamental pillar to building a sustainable healthcare system - is used to demonstrate the experiences of an Australian Local Health District project. The models produced provide rapid feedback on alternative solutions, encouraging clinical engagement in the final solution. The models also provide concrete requirements for new/enhanced ICT functionality needed to support new service designs.

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“WHY DID THE DATA HAVE TO BE REMOVED FROM THE GP PRACTICE?” PATIENT PERSPECTIVES ON A HYPOTHETICAL DATA SECURITY INCIDENT IN PRIMARY CARE

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High profile data breaches in 2012 and 2013 highlighted human and systemic issues in public sector organisations about information privacy and data security. This paper describes patient attitudes and expectations of information privacy and data security as part of a larger study into the role of trust in information sharing between Patients and General Practitioners (GPs) in New Zealand. Using a hypothetical vignette about a data security incident with “Dr Jones”, patients were asked to think about what they would expect if their information “got out”. Patient expectations around data security of patient information and the actions patients expect from GPs and GP practice to remedy a breach are briefly discussed. Patients’ identified both technical and human factors within their expectations of how GPs manage patient information. These factors have an impact on perceptions of trust, and the possibility of rebuilding trust when compromised.

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IMPROVING PERSONAL AND POPULATION HEALTH ANALYTICS USING BIOMETRIC-BASED UHID OVER UNLIKE SYSTEMS

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A transnational paradigm shift from traditional healthcare towards a ubiquitous computing environment capable of exchanging user's medical data between different geographic regions, states and countries, and offering new healthcare services aimed to improve health outcomes is occurring. In order to maximize this evolution of technology, use this data to improve health outcomes, and increase patient safety, we must improve the current weak-link of user identification and matching records. An architectural solution, which can scale globally, work across any type of proprietary or open-source software, and have the capabilities to enforce security and standardization policies is needed. Our UMBRELLA solution implements a touchless biometric fingerprint process as the primary user identification. A fingerprint minutiae mapping algorithm was developed to establish a Unique Health Identifier (UHID) for patients, which doubles as a Universal Provider Identifier (UPI) for medical personnel. A touchless facial-recognition biometric algorithm validates the individual attempting to access the medical record. Policy changes and their propagation for access and authorization provide a flexible and secure architecture. In this paper, we focus on establishing a network design permitting existing healthcare systems to use compliant standardization to cross-match each unique UHID into its own proprietary or open-source architecture, permitting a scalable and enforceable solution.

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IMPROVING 30-DAY READMISSION RISK PREDICTIONS USING MACHINE LEARNING

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Hospital readmission is used as a proxy measure of effectiveness of care providers in New Zealand and overseas, and risk predictions can be used to identify at-risk patients in order to reduce preventable readmissions. Existing objective measures for measuring readmission risk potentially sacrifice accuracy in order to produce models that are simple. This study investigates the hypothesis that using machine learning on a wide feature set will improve the accuracy of readmission risk predictions compared with existing techniques. A publicly available dataset containing 100,000 admissions and 56 features was used to evaluate the hypothesis. The results were encouraging: although the best results were achieved using logistic regression – the same machine learning algorithm used successfully in existing measures – the model improved significantly over the measures derived from a simpler feature set represented in the LACE tool.

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IS HOSPITAL ACCESS TO A SHARED PRIMARY CARE RECORD RELATED TO HOSPITAL PATIENT ACTIVITY?

Peter HICKS ¹

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Auditing of access to clinical information repositories is important. Proximity of access to patient activity is used to validate the access. This study reviews all access by Wellington hospital staff to the primary care repository (Shared Care Record –SCR). Over three months there were 12,167 accesses. 9345 (77%) happened on the same day as a patient event at the hospital, 1117 (9%) accesses occurred 1 - 7 days either side of an event, 901 (7%) accesses were 8 -30 days either side, and 551 (4.5%) accesses had no activity within 30 days of an access. There were 524 users from Wellington hospital with the peak user making 207 accesses. The average access per patient was 1 access. Inpatient and ED events accounted for 71% of access, Day Cases 9% and Outpatients 12%. Delayed access up to 30 days was common to all event types. Only 77% of access occurred with the patient having an event on the same day. These findings limit the benefit of using immediate proximity to validate clinical access to the shared care record, and highlights that we have limited understanding of how our clinicians work.

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WHY USE MATHEMATICAL MODELLING OF INFECTIOUS DISEASES?

Roslyn HICKSON ¹, Tom CONWAY ¹, Annalisa SWAN ¹

1. IBM Research, Australia

We will discuss the use of mathematical modelling to understand the dynamics of infectious diseases. We will firstly present common modelling approaches, identifying key assumptions, strengths, and limitations of each. These approaches will then be discussed in the context of specific real world situations and the questions that are asked by relevant stakeholders, such as policy makers. We will consider two categories of situations where modelling can be used to support the stakeholders. The first category discusses how mathematical modelling can be used to support emergency response and preparedness for an outbreak. The second category discusses supporting decisions for management of non-emergency, persistent diseases. We use the recent Ebola outbreak as our case study of the modelling work that was done. Finally, we will discuss the role that health IT currently has on this field, and the improved role that it could have in the future.

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EXPEDITING SNOMED CT IMPLEMENTATION WITH FHIR TERMINOLOGY SERVICES

Peter JORDAN ¹

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SNOMED CT® (Systematized Nomenclature of Medicine -- Clinical Terms) is a standardised, multilingual vocabulary of scientifically-validated clinical terminology that enables the consistent, processable, representation of clinical content in electronic health records. In New Zealand, it has been endorsed as the standard for coding clinical data at the point of care by the Health Information Standards Organisation (HISO) and is both supported and promoted by the Ministry of Health, specifically as a replacement for the Read Coding system employed in primary care since the mid-90s. However, the implementation of a comprehensive terminology consisting of over 300,000 active concepts, each with multiple descriptions and relationships, represents a significant and complex challenge to the New Zealand health and disability sector. Overseas countries have managed this complexity by developing common application programming interfaces to centralised SNOMED CT terminology services. This paper will consider the potential advantages of adopting such an approach in New Zealand, using a standards-based framework based on modern Internet technologies - Fast Healthcare Interoperability Resources (FHIR®) from Health Level Seven (HL7®).

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TOWARDS ENHANCED COMPUTATIONAL PHYSIOLOGY THROUGH SEMANTICALLY LINKED HEALTH INFORMATION

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Linking computational physiology models and simulations with real-world health data, including both clinical and wellness type which may also include environmental factors such as nutrition, physical exercise etc., can result in more elaborate, better validated and more robust computational models. This would lead to more personalized and predictive clinical decision support systems and ultimately help realize Precision Medicine. However, this can be hindered by syntactic and semantic inconsistencies. Standards such as openEHR, HL7 and DICOM can address these issues in health information systems, and in a similar way, standards such as CellML, SED-ML, and FieldML can cope with syntactic and semantic inconsistencies in computational models and simulations. This paper proposes a semantically-enriched linkage of computational models and real world health information through a collaborative ontology-based infrastructure. A collaborative shared ontology-based approach is suggested to tackle difficulties in ontology mapping in the first step which can bridge computational models/simulations and health information.

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PATIENTS' PERSPECTIVES ON ACCESSING AND USE THEIR OWN PERSONAL HEALTH RECORDS VIA A PATIENT PORTAL: AN EXPLORATORY STUDY

Siobhan MILLS¹, Gayl HUMPHREY¹, Karen DAY¹

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INTRODUCTION

Patients usually do not record the content of their visits to doctors. Portals into their health records could add value to patient-doctor relationships and interactions. Portal use could result in better patient centric care. However, many portal benefits are defined by clinicians. Patients are the ultimate end users of patient portals so why are their attitudes and beliefs not framing the literature? The purpose of our research was to examine patients' perspectives of being able to access and use personal health records via a provider-tethered patient portal.

METHOD

A small exploratory study using primary data collection in a single general practice in South Auckland was conducted. The Technology Acceptance Model (TAM) was used to frame the research. An online questionnaire was used to gather quantitative data for an overview of patients' perspectives. Patients of the general practice were extended an invitation to participate in an interview to explore questionnaire themes further. Thematic inductive analysis was utilized to interpret the findings.

RESULTS AND DISCUSSION

Seventeen patients completed the questionnaire, of whom eight were also interviewed. Participants were eager to use the portal. The ability to view laboratory results was indicated as one of the most beneficial aspect of the portal. Privacy concerns, while often indicated in the literature, were not common in our findings. Participants felt they would benefit from using their portals. The results of this exploratory study align with other portal studies, indicating that despite slight differences in portal functionality, patients do believe they are useful and should be more available.

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A COMPLEXITY APPROACH TO DIGITAL HEALTH BEHAVIOUR CHANGE: CHALLENGES AND OPPORTUNITIES FOR AN EMERGING SCIENCE

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Convergence of digital and genomic revolutions commonly known as digital health has the potential to evoke behaviour changes for the betterment of individuals and society. Despite opportunities for radical transformation, digital health remains faithful to the social cognitive paradigm of psychology and dominant information-processing metaphor. Within this social cognitive paradigm, behaviour change is framed as a deterministic process whereby inputs produce linear, predictable changes in outputs. However, evidence shows the social cognitive paradigm and related methods are deeply flawed. This can be seen in the high numbers of people having a spontaneous epiphany to reverse health-damaging behaviours or adversely entering relapse post-sobriety. The complex and adaptive nature of healthcare prompts this paper to argue that future digital health projects are best understood and developed through the lens of complexity science. Key points raised position the idea of digital health behaviour change as: (i) a quantum event; (ii) a chaotic process that is difficult to predict; and (iii) part of a complex adaptive system with multiple components, where results are greater than the sum of its parts. Alternative tools to help researchers map social complexity and prototype solutions are discussed.

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DISASTER E-HEALTH AND INTERAGENCY COMMUNICATION IN DISASTER HEALTHCARE: A SUGGESTED ROAD MAP

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1. AUT, New Zealand

A disaster is an event with a destructive environmental or ecological impact that cannot be managed within local community resources. When such an event takes place, health professionals and emergency managers have the central roles in responding and providing relief. Communication between these two groups is therefore crucial to ensure effective interventions. However, studies have shown that disaster circumstances often produce poor communication between these agencies. This paper describes research that attempts to improve the collaborative action of health and emergency management personnel in a disaster by revealing the challenges that hinder smooth and meaningful communication between them. The research is part of an international project that is building a road map for disaster e-health, a domain that uses modern e-health technologies not only for communication purposes but to deliver timely and effective healthcare whilst optimising the use of frequently scarce resources. The paper outlines the phases of the road map and the key issues that need to be addressed for disaster e-health to become an indispensable component of future disaster healthcare.

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THE DIGITAL DISRUPTION OF HEALTHCARE

Dave PARRY ¹, Tony NORRIS ¹, Dev SINGH ¹, Anaseini PALU ¹

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This paper has drawn attention to innovation in the health sector and in particular to the role and impact of digital disruption, which is present in seemingly every domain of human endeavour. Christensen's disruption model is put forward as a means to understand the implications of digital disruption and to derive its benefits whilst controlling the less beneficial effects on stakeholders. The paper explores the likely impact of digital disruption in New Zealand and considers the country's health system well-positioned to meet the challenges.

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A MIXED-METHOD STUDY OF CARDIOVASCULAR MEDICATION ADHERENCE BEHAVIOUR IN RELATION TO MEDICATION EXPERIENCE

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BACKGROUND

Adherence to long-term medications is a cornerstone of evidence-based management of cardiovascular disease (CVD), but rates of non-adherence are high. Research suggests a relationship between experience with long-term medication and adherence behaviour that warrants further exploration to suggest pathways for adherence promotion.

METHODS

This mixed-method study explored medication understanding, self-efficacy and adherence for longer-term and newer users of CVD medications. Patients were recruited from an Auckland general practice serving a predominantly Pacific Islander population. Data collection included an interview based on the Medication Understanding and Self Efficacy (MUSE) scale, Medication Possession Ratio (MPR) from the practice's prescription records, and a focus group about participants' medication-taking behaviour. Data analysis took a grounded theory approach to understanding the relationship between medication experience and adherence.

RESULTS

Among the 17 patients interviewed, 6 (35%) were non-adherent (MPR<80%) to one or more cardiovascular medications. Adherence status was associated with age ($p=0.0103$), but not with MUSE score or other variables. However, qualitative data suggest that belief that the medication works, social factors (including relationship with the doctor) and an attitude that health is the priority were precursors to adherence.

CONCLUSION

Our theory suggests a range of factors that can lead to improved medication adherence over time, particularly if the care team is supportive of the patient journey.

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PERSONALISED HEALTH CARE A RCT PILOT FOR THE DELIVERY OF CHRONIC DISEASE CARE FOR PATIENTS WITH COPD AND DIABETES USING A HOME MONITORING SOLUTION

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1. Barwon Health, Australia

AIM

Project Aim: The primary aim of this pilot study is to decrease the emergency presentation rate and hospitalisation of clients that have been identified as being at risk of presenting to the acute service within the next 12 months.

METHODS

Method A randomised controlled methodology was used in this pilot study. Two diagnostic groups of COPD and diabetes were established. An economic evaluation was also undertaken.

RESULTS

There is evidence to suggest that those in the intervention group had fewer emergency presentations and admissions than those in the control group. There was a statistically significant difference in the mean hospital length of stay over the 12 months of the pilot. **Table Mean Total Cost and Cost Difference of Personalised Health Care PHCP Intervention n=86 Usual care n=85.** A means Total cost of the intervention including hospital costing data was \$12,796 and for usual care the total mean cost was \$12,081. The total mean difference was \$714 in favour of the intervention. A demonstrated difference of 0.08 in quality adjusted life years saved is likely to be clinically significant. The overall outcomes for the heiQ showed improvement in outcomes domains that were similar to the Australian Benchmark.

CONCLUSION

The savings in hospitalisation costs in the intervention group did not offset the higher PHCP intervention costs. Positive quality of life and health literacy outcomes support the intervention as effective and user friendly. Opportunities for the future present themselves in regards lower cost of service delivery.

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WAITEMATA DHB LEAPFROG PROGRAMME

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This paper outlines the approach Waitemata DHB has taken in implementing a programme of strategic projects, many involving the implementation of new health IT systems such as electronic vital signs and nursing assessments on the wards. Success factors in this programme have included: CEO sponsorship and the high visibility that comes with that; strategic consideration of projects and overarching themes; building a team including clinical leads and IT; recognition of the issues facing clinical change; leveraging other developments to fast track processes where possible; and a commitment to upfront funding and resources. The projects have not all moved as quickly as intended, with many lessons learned for future project development and implementation.

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Clinical Case Studies

This is an exciting year for the HiNZ annual conference as it is one of four conferences, running in conjunction with Global Telehealth (GT 2016), Successes & Failures in Telehealth (SFT-16) and the NZ Nursing Informatics Conference (NZNIC-16). It is a rare event where delegates can attend multiple conferences at once and have such a selection of concurrent events. The clinical case studies within the HiNZ programme will be popular with many due to their practical yet innovative nature. Presenters are from around the country and provide a range of topics. Some are simple solutions to everyday problems faced in healthcare, while others may give provide ideas on how to avoid potential pitfalls. Either way the clinical case studies are ones to mark in your programme so you can enjoy them as presentations and posters. My deputy-chair Rebecca George, Clinical Lead in Informatics for Allied Health at Canterbury DHB and I wish to thank the many people who submitted abstracts for consideration and to the team of reviewers, named below, who assisted by reading each abstract and providing feedback as part of the selection process. We trust you will enjoy and benefit from the sharing of the clinical case studies within the programme.

Dr Michelle Honey

Chair of HiNZ Clinical Case Study Programme Committee



THANKS FOR THE 2016 HINZ CLINICAL CASE STUDY REVIEWERS

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Denise Irvine
Sandy Marshall

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Anthony Spencer
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HOW VENDOR NEUTRAL ARCHIVING (VNA) AND ENTERPRISE CONTENT MANAGEMENT (ECM) CAN PROVIDE ADVANCED INTEGRATED CLINICAL INFORMATION

Laura PIETROMICA ¹

1. Hyland, creator of OnBase, USA

INTRODUCTION

Developing an integrated, enterprise-wide medical imaging and clinical information strategy is becoming a necessity these days with images and disparate, unstructured clinical information generated from various specialty departments, such as radiology, cardiology, obstetrics, pathology, dermatology, as well as many others. It is vital for healthcare organisations to implement a comprehensive clinical information strategy to capture, view, share and archive images and other unstructured data. In addition, clinicians need ready access to this information from multiple types of devices, including mobile technologies.

USE OF TECHNOLOGY

Integrated medical imaging and clinical information solutions have been traditionally developed for departments such as radiology and cardiology, but exist for a wide array of other departments. Clinical information data repository silos are quite common in the post-EHR adoption era, and present inefficient workflow challenges for clinicians. An integrated Vendor-Neutral Archive (VNA) and Enterprise Content Management (ECM) solution turns challenge into opportunity. It is important and necessary for all healthcare organisations to establish a clinical information strategy to capture, view, share and archive images and information in order to improve patient care.

IMPLEMENTATION

Implementing an advanced clinical information solution will significantly improve operational and workflow efficiencies, and more importantly, improve quality and continuity of patient care.

CONCLUSION

The audience will take away the following learning points:

- 1) Common sources and challenges inherent with unstructured data silos
- 2) Best practices and solutions for incorporating images and other disparate data into the point-of-care process
- 3) Benefits and value of a fully integrated clinical content information solution in order to demonstrate return on investment and quality of care
- 4) The purpose, features and benefits of a fully integrated VNA and ECM centralised repository solution
- 5) How a single point of access to all clinical information can improve the patient care experience

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SUPPORTING COMMUNITY CLINICIANS TO ADOPT MOBILE DEVICES

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INTRODUCTION

Traditionally Waitemata District Health Board's (DHB) community allied health clinicians have kept paper records. Since electronic health records were introduced in 2005 clinicians have completed both paper notes in the community and electronic documentation at the hospital base. This process presents a risk to efficiency, security and accessibility of health information. Mobile devices were identified as a potential solution. However, organisations typically describe challenges integrating technology into practice.

USE OF TECHNOLOGY AND/OR INFORMATION

We provided 120 community allied health clinicians with a corporate owned personal IOS mobile device on a Mobile Device Management platform (MDM). Devices were intended to improve clinical workflow, clinician and patient experience. Functionality included remote access to their emails and calendar, a repository of pre-approved apps, a remote desktop application with access to DHB applications, including the electronic health record, and access to the DHB's patient experience survey.

IMPLEMENTATION/PROCESSES

We developed a project plan, communication plan and change management procedure. We employed a project lead to support device implementation; a community clinician who participated in the project's pilot phase. The implementation phase consisted of a 2.5-hour group set-up session and two 1.5-hour follow-up sessions. Teams agreed on short term goals to promote mobile device use in clinical practice for example, this fortnight use the electronic calendar to schedule patients. The adoption phase consisted of monthly forums. Forums were a combination of semi-structured education sessions and unstructured clinician-led sessions.

Half of our community clinicians have over 15 years' experience in their role. A quarter told us they were apprehensive about technology before using the mobile device. Most clinicians told us the mobile device could make their job easier and they were willing to use it. MDM results show 95% of our clinicians are currently accessing the devices during their work day.

CONCLUSION

Despite expressing apprehension about technology, our clinicians have engaged in this project and have successfully started to adopt mobile devices into their daily work. Our experience supports the importance of having a clear clinically-led plan to aid implementation and adoption of technology.

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BETAME-DIGITAL PREDIABETES SELF-MANAGEMENT PILOT

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INTRODUCTION

BetaMe is a 28-week digital health programme for people diagnosed with pre-diabetes to better manage their health. BetaMe was piloted in partnership with Midlands Health Network with 117 patients in Waikato as a community-based digital self-management programme to augment existing care for patients wanting to engage in positive health behaviour change.

USE OF TECHNOLOGY AND/OR INFORMATION

BetaMe is delivered on mobile and web. Its modular-based providing patients with 8 two weekly modules focusing on evidence-based lifestyle behaviour change relevant to pre-diabetes. Participants have an initial 1:1 on-line session with coach using MI techniques to set values based goals.

Core components:

- peer community (monitored by a clinically trained community manager)
- health coaches 1:1 coaching through video or audio
- health tracking - exercise, food, mood
- nudges, reminders
- engaging resources
- access to clinic nurses using direct messaging or 1:1 audio-visual sessions and a clinic dashboard
- Integration with wearables, bio-metric sensors

IMPLEMENTATION/PROCESSES

- Agreed on pilot objectives, patient numbers, outcome measures
- Workshop with clinic staff to determine approach for enrolment -training on platform.
- Patients attended clinic for baseline measures
- Health coach contacted patients, conducted myHealth survey (PAM score), encouraged them to engage with peer community
- After 16-week core programme, patients rescreened at clinic
- PAM score and survey of programme satisfaction taken.

CONCLUSION

Outcomes for 77 patients

Measure	Improvement	Average reduction in measure
HBA1c	91% reduced HBA1c	2.6 mmol/mol
Weight	94% lost weight	4.2 kg
BMI	94% reduced BMI	
Waist Measure	87% reduced waist measure	4.2 cm
Pre-diabetes	78% no longer have PD	
Blood Pressure	59% have normal blood pressure	

Lessons

1. Programme needs to be accessible on mobile, tablet, desktop as people use variety
2. A time delay between first person signing up and programme starting. Going forward we're enabling people to start on any Monday.
3. Nurses were initially concerned they'd be contacted by patients via platform regularly. This didn't happen as patients received adequate support from the programme.

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BENEFITS OF IN-HOME TELEHEALTH MONITORING: DALLAS' STORY

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INTRODUCTION

Dallas is 85 years old and has diabetes and heart failure, with hypertension, dyspnoea and fatigue. Dallas' blood pressure is also high however this is a secondary concern as she is already on hypotensive drugs.

With multiple conditions, Dallas was finding it difficult to manage and was frequently having to visit her GP.

USE OF TECHNOLOGY AND/OR INFORMATION

An in-home telehealth monitoring solution was installed in Dallas' home, including a telehealth hub, blood pressure monitor, pulse oximeter, thermometer, weight scales and blood glucometer. Dallas was shown how to measure her vital signs using the telehealth hub and to answer a series of clinical questions to determine her current condition.

IMPLEMENTATION/PROCESSES

Telehealth allows Dallas to manage her conditions from home, reducing her need for frequent unplanned GP visits. Telehealth requires Dallas to take her vital signs and answer a series of health related questions four days per week. These details are then automatically transmitted to a monitoring centre where RNs compare the data to Dallas' 'normal' readings. Abnormal readings are flagged for follow up with the patient and her GP.

Through their interactions, Dallas advised one of the RNs responsible for monitoring her vital signs that she was having difficulty swallowing. In addition, through monitoring Dallas' readings four days per week, the RN identified a trend of increasing blood pressure and blood sugar levels, and also noticed an increase in Dallas' weight which was flagged as a possible result of renal and heart failure. The RN contacted Dallas to recommend that she visit her GP to further investigate these results, and sent Dallas' readings to her GP for reference.

CONCLUSION

Upon visiting her GP, undergoing a blood test and further testing, the GP identified that Dallas had anaemia, a corkscrew oesophagus and renal function deterioration. The GP advised Dallas to take iron tablets for her anaemia, put her on medication for her corkscrew oesophagus, and changed her blood pressure medication to counteract her rising blood pressure. The GP also referred Dallas to a specialist for treatment for her renal function deterioration.

Fortunately, Dallas' renal deterioration was identified before renal failure and was therefore treatable, avoiding dialysis.

The telehealth clinician's ongoing relationship with Dallas meant that she could work alongside Dallas and her care team to identify trends in Dallas' conditions and intercept issues before they progressed.

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TECHNOLOGY, IT INSPIRES AND ENABLES SENIORS TO BECOME 'SILVER SURFERS'.

Shelly FLETCHER ¹, Michael SCURRAH ¹

1. Feros Care, Australia

INTRODUCTION

Limited mobility and poor health can make it difficult for seniors to leave their home. Visiting a doctor or health professional can be difficult for those who most need it, the oldest-old, the very frail or those with chronic health conditions. Their challenges were addressed by using technology; clients have been provided with solutions to connect them with the health care services they need. This presentation will describe Silver Surfers: an innovative service delivery model incorporating eVillage, My Health Clinic at Home and Wheel-I-Am.

USE OF TECHNOLOGY AND/OR INFORMATION

eVillage has been implemented in three Residential Villages. Using technology, residents and an onsite Registered Nurse connect with their General Practitioner or specialist via video-conferencing, residents communicate "face-to-face" with their doctor, discuss their medical needs and receive real benefits from a virtual consultation. Similar technology has also allowed residents who are unable to access transport to attend social outings by using a telepresence robot, known as Wheel-I-Am.

My Health Clinic At Home provides video calls between health professionals and seniors living in their own homes.

IMPLEMENTATION/PROCESSES

In two years, the eVillage has facilitated 435 video calls involving 127 residents, 39 general practitioners and four specialists. Hospital admissions have been avoided on 52 occasions and transport costs reduced by in excess of \$45,000. In addition, Wheel-I-Am which is an iPad on wheels has allowed residents to virtually tour art galleries, libraries, cafes and holiday destinations. The program has also connected a resident living in Australia to her grandson's wedding in the UK.

An 18 month My Health Clinic at Home Telehealth program performed 5,000 video calls between seniors living in their own homes and health professionals.

CONCLUSION

These programs have been effective in change management, creating financial sustainability, and caring for clients with a higher level of dependency. This presentation will share knowledge, lessons, and recommendations for implementation. The aim is to inspire other organisations within the aged care sector to revolutionise service delivery using technology and prepare businesses to be responsive to challenges and changes in the sector.

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UNCOVERING BEST PRACTICE IN HIDDEN PLACES – DATA SPECTACLES ARE ESSENTIAL

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2. DHB Shared Services, New Zealand

INTRODUCTION

The demand for and pace of eHealth development and data analytics that enable the application of knowledge to clinical processes, have concurrently exploded. To have capacity to provide insights into clinical processes, service models, and the patient's interaction with a multidisciplinary service is vital. It is indeed the growing awareness of the impact of new technologies that has driven the need for Allied Health (AH) to gain a foothold in this arena.

USE OF TECHNOLOGY AND/OR INFORMATION

In order to demonstrate the value of AH activity and service models we need to maximise the value of data collected from the AH professional groups and in turn, facilitate collaborative benchmarking, best practice and standardisation of data elements, data reporting has been identified as being essential.

The National Allied Health Data Collaborative provided a forum in which discussion and debate guided the development and creation of a service level Allied Health National Minimum Data Set (NMDS) for the five Allied Health Professions prioritised. The Care and Capacity Demand Management (CCDM) Programme, already in existence, identified the need for inpatient clinical activity standardisation and concurrently created the Activity Data Set. With both data sets fully endorsed it is the intention to merge them and provide a 'single source of truth' repository that will provide analytics and reporting across the DHB Allied Health network.

IMPLEMENTATION/PROCESSES

The creation of the Allied Health NMDS and the CCDM Activity Data Set have been significant achievements. They now provide a framework through which to guide the Allied Health services across New Zealand in their contributions to the programming and development of the electronic health record, as well as understanding the AH professional's contribution to the patient's health care journey.

In support of the New Zealand Health Strategy; a standardised data structure, single repository and reporting framework will benefit the health system nationally, locally and regionally with accurate and reliable information on Allied Health services. It will contribute towards developing lean models of interdisciplinary service delivery, identifying service capacity response and requirements, and ensuring that the patient's time and health journey is valued at every point of service delivery.

CONCLUSION

The alignment and merging of these two data sets will increase the information and therein the knowledge base, of Allied Health services across NZ. Supporting this with the creation of a single repository that facilitates concise, visual reporting will benefit all levels of service provider as we ensure the health and wellbeing of our patients.

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'VIRTUAL WARD ROUNDS' – IMPROVING RURAL INPATIENT ACCESS TO A CONSULTANT GERIATRIC REHABILITATION SERVICE VIA TELECONSULTATIONS.

Sophie GERRITS ¹

1. Waikato District Health Board, New Zealand

INTRODUCTION

Thames Hospital is a small rural hospital set within the Waikato DHB in the mid-central area of the North Island of New Zealand. The hospital has 52 inpatient beds, of which ten beds are dedicated to Rehabilitation patients. These patients are transferred primarily from the major tertiary hospital (Waikato Hospital), which is one hour and twenty minutes away. The inpatient rehabilitation patients previously only had once weekly review by the consultant Geriatrician supplied through the Older Persons and Rehabilitation (OP&R) service based at Waikato Hospital and there was evident potential to use Telehealth technology to increase the provision of specialist care 'closer to home'.

USE OF TECHNOLOGY AND/OR INFORMATION

Recently, Waikato DHB actively developed a Telehealth Strategy and as part of that strategy a Mobile Cart Video-conferencing cart was supplied to Thames. The OP&R Geriatrician completes a weekly consultant ward round using a remote audio-visual unit based at Waikato Hospital.

IMPLEMENTATION/PROCESSES

This ward round is in addition to the traditional weekly in-person consultant ward round, improving patient access to equitable health care. This is conducted at the patients bedside through the Video-Conferencing Cart - a Multi-Use wireless trolley, utilising user friendly video-conferencing technology. The Rural Registrar and Nursing staff are present to facilitate the ward round. The Author is currently completing a research project to explore the impact of this new Telehealth service on this small rural inpatient ward. The study consists of a concurrent two-phase mixed method design. Titled - 'Virtual Ward Rounds: The impact of teleconsultations on experience, costs and length of stay'.

CONCLUSION

The Virtual Ward Rounds have been successfully operating since September 2015. The researcher is currently completing data collection, including patient interviews and focus groups with ward staff to explore their experiences of inpatient remote ward rounds. Feedback has been extremely positive so far, in a primarily geriatric population. I hope to present a snapshot of how this service has been implemented, the experiences (and challenges) staff and patients contributed - which will be derived from preliminary research findings, and what this exciting new service may mean for the future.

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CREATING A SAFER AND MORE EFFECTIVE AFTER-HOURS SERVICE WITH CLINICAL NURSE COORDINATORS AND SMARTPHONE BASED COMMUNICATION AND COORDINATION.

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1. Oncall Health, New Zealand
2. Waitemata DHB, New Zealand

INTRODUCTION

The hospital out-of-hours is widely regarded as an unsafe time for hospital patients and clinicians. Standard clinical teams are unavailable and hospitals are covered by a skeleton staff of junior doctors and nurses facing high work-loads and acute medical issues.

To cope with higher after-hours workloads, Waitemata DHB, Auckland DHB and Canterbury DHB have introduced after-hours clinical nurse specialist roles to oversee hospital operations and aid ward clinicians.

These coordinator roles have traditionally stood as an intermediary communicating between nurses and clinicians. They receive calls, discuss with nurses to get more clinical information, then forward on batches of tasks to the appropriate doctor. This introduces an element of oversight, allows them to triage after-hours tasks, and reduces interruption; however, can also introduce significant delays, involves a large amount of manual communication for the coordinator, and removes the ability for direct and on-going communication between nurse and doctor.

USE OF TECHNOLOGY AND ITS IMPLEMENTATION

Waitemata DHB uses a smartphone based clinical communication system called Smartpage for their after-hours hospital. Waitemata has now expanded this system to implement a new clinical coordinator role that works in a different and more effective way than what could have been done previously.

With this system, the coordinator can view all hospital tasks in real-time, oversee clinician workload, transfer or take back tasks, and communicate instantly with clinicians, clinical nurse managers or ICU nurses via mobile.

Instead of the coordinator screening all tasks, tasks are sent directly to clinicians. Each task is sent with full patient and task details, vital signs, early warning scores and triage scores, removing the need for the coordinator to collect additional details or manually triage tasks. Tasks are delivered immediately, and the coordinator can then overview all tasks, clinicians and workload, intervening when and where they are required.

In addition to the coordinator role, the ability to transfer tasks based on workload has allowed Waitemata DHB to implement a new system of float clinicians that work directly with the coordinator to relieve areas of high workload. This is a new and effective solution to the common issue of high workload fluctuations between services.

CONCLUSION

This talk explores the implementation and success of the new clinical coordinator role at Waitemata DHB, and how smartphone technology has helped to enable a safer and more effective hospital after-hours.

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USING A FACEBOOK FORUM TO CHAT ABOUT ARTHRITIS

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2. University of Otago Wellington, New Zealand
3. Arthritis New Zealand, New Zealand
4. University of Auckland, New Zealand

INTRODUCTION

Arthritis New Zealand (NZ) is the leading provider of information and support service for all people affected by arthritis in NZ. Generic arthritis information is available on the Arthritis NZ web page. Tailored information and advice is available via telephone from Arthritis Educators (AEs), who are health professionals employed by Arthritis NZ.

USE OF TECHNOLOGY AND/OR INFORMATION

To offer access to AE services online, Arthritis NZ has implemented AE-led "chat sessions" on the Arthritis NZ Facebook page (ArFB). An AE spends two hours on Monday evenings providing information and advice to users.

IMPLEMENTATION/PROCESSES

Our analysis of the chat session dynamics described participants, and use and content of chat sessions. We aimed to gain insight into "what is happening" during these sessions, and determine if the chat session use is useful for identifying types of information/support required by users.

Data were collected from 12th October to 21st December 2015. Facebook Analytics and summary statistics were used to describe users and their activities on ArFB. Transcripts from the chat sessions, containing all posts and comments by AEs and users, were thematically analysed.

The 1778 users of ArFB were predominately female (81%), aged 18-54 years. The chat sessions were small (median of 8 users per session). Overall, 55 individuals participated. Most users commented infrequently and nearly half (48%) of all comments came from the 10 most frequent users. About half of the activity (55%) was an AE replying to a post, with relatively little user-to-user interaction. User interactions with AE were characterised as: (1) seeking or giving support; (2) information enquiry; and (3) information sharing. Key foci for information or support for users were symptom management, emotional wellbeing, optimisation of physical function and participation and barriers to healthcare.

CONCLUSION

The ArFB chat sessions are confirmed as a forum for informational and emotional support for users from AE. Few users engaged in conversation while most observed. Arthritis New Zealand is exploring training AEs in facilitating online user engagement, providing online AEs during office hours, and developing other fora for online engagement for people affected by arthritis in NZ.

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THE BENEFITS START EARLY WITH THE EMR ADOPTION MODEL (EMRAM)

Lorna GREEN¹

1. Hyland, creator of OnBase, USA

INTRODUCTION

The pinnacle of success in the world of Healthcare technology is obtaining HIMSS Level 7 utilising the EMR Adoption model (EMRAM). Stage 7 is an internationally recognised award and brings great prestige to a hospital by demonstrating that an organisation is fully electronic and gives high quality care to their patients.

USE OF TECHNOLOGY

Reaching Stage 7 is a journey with positive benefits for the patient beginning in Stage 1. This presentation will walk through the EMRAM Stages and discuss the requirements and clinical advantages as organisations implement technology and processes reflected on the EMRAM scale.

IMPLEMENTATION

The journey starts with Stage 1 implementing Radiology, Laboratory and Pharmacy software that creates the foundation of increased access to patient data. It continues with incorporating a scanning component to digitise paper, electronic clinician documentation, and integrating PACs images and reports which improves patient safety. Closed Loop Medication Administration and Clinical Decision Support have been proven to decrease medical errors which save lives. As organisations progress through the Stages of the EMRAM model, they increase their Continuity of Care and patient safety benefits.

CONCLUSION

This presentation will explain each EMRAM stage and provide IT Professionals and Clinicians with specific information validating the need to begin the journey toward Stage 7. Often the EMRAM project is led by IT staff, however a cross functional team including representation from Informatics is the key to success in this endeavour.

Attendees will come away from this presentation understanding the challenges of utilising technology, but also see the value that comes to the patients and clinicians when technology is implemented in a thoughtful and meaningful way. This presentation will give attendees the needed knowledge to lead their organisations forward with technology.

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MOBILISING NURSING ASSESSMENTS AT THE POINT OF CARE

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1. Waitemata District Health Board, New Zealand
2. Orion Health, New Zealand

INTRODUCTION

Waitemata District Health Board's Innovation group and Ward 10 (medical ward, North Shore Hospital) partnered with Orion Health to develop electronic nursing assessment forms. We aimed to increase patient safety and patient contact time by improving access to information and decreasing administrative burden.

USE OF TECHNOLOGY AND/OR INFORMATION

Five mandatory forms of the nursing booklet have been digitised, from a total of ten forms in the nursing booklet. The solution was installed for use on iPads, desktop and mobile PCs on the ward. Technology is transforming nursing practice by allowing nurses to:

- Capture patient data at the point of care from a selection of mobile devices
- Reduce manual calculation time via auto-calculation and pre-population of patient data
- Preview an overall summary of patient risks on one screen
- Identify high-risk patients and overdue assessments through the use of colour-coded indicators

IMPLEMENTATION/PROCESSES

Three nurse trainers delivered in-person training to ward nursing staff. They also provided technical assistance and covered clinical duties while staff adapted to the new system. This built on training for a previous electronic solution on the ward and focused on ensuring processes were more convenient to complete.

CONCLUSION

- Mobility is transforming nursing practice. Providing nurses with mobility in their daily routine provides flexibility, improved patient data quality and timely access to clinical information.
- Innovation is a moving timeframe. The complexity of working across multiple organisations proved challenging as specialised people required for technical troubleshooting could not dedicate time to the project due to external constraints. Constant communication across all stakeholders was important to ensure teams were clear on requirements and the impact of moving timeframes on end-user expectations and patient safety.
- There are no guarantees. While rigorous vendor integration testing performed as expected, once in a live production environment this presented issues which were only apparent when in action with all other systems.

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88-YEAR-OLD WOMAN WITH CHRONIC FATIGUE AND DEPRESSION RECOVERS HEALTH IN 6 MONTHS WITH ONLINE SELF-HELP PROGRAM

Kim KNIGHT ¹

1. Kim Knight Health, New Zealand

INTRODUCTION

An 88-year-old Australian woman approached me for help for chronic fatigue and depression which she had experienced for 50 years. After trying multiple medical and natural approaches, symptoms were worsening leaving her unable to function fully or enjoy life. In her words "I could hardly lift my arm to reach a glass of water on my bedside table".

USE OF TECHNOLOGY AND/OR INFORMATION

I offer remote phone / Skype sessions and an online self-help program. For budgetary reasons she opted for the online program and a discount was offered in light of her situation and age. The drip-fed lessons consist of pre-recorded videos, downloadable MP3 files and pdf handouts accessible 24/7 via a private membership portal.

IMPLEMENTATION/PROCESSES

She joined the program January 2016 and progress was initially challenging due to an old computer. I conducted a complimentary private session by Skype to help with morale. This proved successful as insights to her current situation were brought to light. She continued on with the program by herself, which improved with a new computer bought by her son. She joined two monthly group support webinars and contributed feedback in the private Facebook group. In March she broke her arm putting a temporary halt to her using the program, but continued implementing the techniques she had learnt in everyday life.

CONCLUSION

In June 2016 she attended the monthly group support webinar and as the only person in attendance she shared her excellent progress: in December 2015 before joining the program she rated depression 9-10/10 and fatigue 8/10. Six months later depression rated 0/10 and fatigue 2/10. In an email a week later she noted "It is such an amazing feeling not to be weighed down with depression. Even those that admitted something was wrong had no idea what to do, and it is so demoralising leaving surgeries with no hope. I am more grateful than I can say".

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REMOTE WORLDWIDE PHONE AND SKYPE THERAPEUTIC CONSULTATIONS FOR MYALGIC ENCEPHALOPATHY, CHRONIC FATIGUE SYNDROME AND FIBROMYALGIA.

Kim KNIGHT ¹

1. Kim Knight Health, New Zealand

INTRODUCTION

Patients with chronic fatigue, Myalgic Encephalopathy, fibromyalgia and associated conditions are often too ill to travel for treatment, or do not have a local practitioner. Initially sceptical if remote sessions would work as effectively as face-to-face consultations, as a result of demand it was decided to trial remote phone sessions of Mickel Therapy in 2008.

USE OF TECHNOLOGY AND/OR INFORMATION

Sessions were conducted by phone, and from 2010 via Skype, with or without video. Skype screenshare allows visual sharing and viewing of materials. In 2015 Zoom meeting technology was added for greater clarity and stability, which also offers video or audio session recordings, which is useful for patients with brain fog and poor memory. Written materials (homework, exercises etc) are emailed to the patients post session.

IMPLEMENTATION/PROCESSES

Initially patients were located solely in New Zealand, and then enquiries arrived from Fiji, Singapore, India, USA, UK and Europe. Patients do sessions from home, even from their bed if necessary, and working clients can do sessions from their office or car. Sessions are usually 75 minutes in length.

CONCLUSION

It was apparent from the first session that remote sessions are effective: the very first patient, a 75-year-old woman unable to drive from Whangarei to Auckland, was symptom-free from fibromyalgia after two months of weekly sessions, leaving her well enough to return to her home city of Christchurch.

After conducting several hundred remote consultations over a period of eight years, it has been concluded that remote sessions are equally effective as in-house consultations, and in many cases often preferable to the patient because there is no travel stress, and they feel relaxed and literally 'at home'.

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CLINICAL BENEFITS OF WIRELESS ELECTRONIC VITALS DOCUMENTATION

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INTRODUCTION

The traditional method of writing vital signs on paper or transcribing vital signs into an electronic medical record (EMR) is prone to errors and delays in communication and reduces nursing efficiencies. Patient deterioration indicators are also affected by these errors and delays. Wireless transmission of patient vital signs directly from a vital signs device to the EMR improves workflow efficiencies and reduces documentation errors.

USE OF TECHNOLOGY AND/OR INFORMATION

Reducing errors:

Recording vital signs on paper or transcribing patient vital signs into an EMR has an error rate of around 15% compared to a wireless system with an error rate of 0%. The use of a vital signs device that can scan the patient identification, complete a full set of vital signs and send the data wirelessly to the EMR removes the risk of data entry errors.

Improving efficiencies:

Sending a full set of vital signs from the bedside to the EMR improves workflow processes. The time taken between recording vital signs and having them available in an EMR for review using paper documentation has been shown to take up to 30 minutes. The wireless method is instantaneous, reducing the average time of documenting vitals by 1/3.

Early Warning Score:

Transcription errors and delays in documentation may cause failures in Deteriorating Patient Notifications. Ensuring that a full set of vital signs are sent directly from the bedside ensures that deteriorating patient policies are most effectively supported. Immediate notification of a patient's Early Warning Score (EWS) at the bedside supports timely interventions for patient care.

IMPLEMENTATION/PROCESSES

Our vital sign devices are configured with a bar code scanner. The clinician simply scans their own unique ID followed by the patient ID. A set of vitals is performed then wirelessly sent to the EMR. At this time, the EWS is displayed on the device and the nurse confirms this notification to sign off the documentation process. This entire workflow takes less than 1 minute.

CONCLUSION

Utilising a wireless vitals documentation system improves documentation accuracy, improves efficiencies and compliments national deteriorating patient policies.

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LEAPING THE CHASM – SUPPORTING CLINICIANS TO DELIVER 'FACE TO FACE' OUTPATIENT SERVICES VIA TELEHEALTH

Emma LACEY-WILLIAMS ¹, Jane GEORGE ¹

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INTRODUCTION

With a large geographical area and a relatively low population the District Health Board is a predominantly rural health service.

As a front runner in Telehealth initiatives and with a 6-year history of user experience, the District Health Board has continued to support Telehealth within the wider community. Valuing patient lifestyle choice, finances and time via avoidance of lengthy transport times to the main health centres, have ensured that Telehealth outpatient clinics have flourished.

The ability to conceptualise and engage with clinical practice and service delivery through this medium has been variable both across and within disciplines of Allied Health. To ensure that services are consistently available rather than being dependent on an individual's technological skills, foundation projects have been developed to identify strengths and benefits that have meaning for all Allied Health clinicians involved.

USE OF TECHNOLOGY

To reduce the considerable travel time required to connect Allied Health clinicians and people using their services, by widening the reach of Telehealth.

To understand the incentives and barriers for Allied Health clinicians embarking on a journey of outpatient clinic delivery via Telehealth.

IMPLEMENTATION

Utilising the Technology Adoption Life Cycle theory and Geoffrey Moore's 'The Chasm', the District Health Board's Allied Health Services have embarked on a series of foundation projects to support clinicians to safely and confidently deliver appropriate services via Telehealth.

Successful strategies and learnings will be presented in detail.

The strategies implemented following the foundation projects have escalated the difficulties in resourcing hardware. In order to continue the success of the strategies there needs to be a system wide approach to the solution. This means that with limited cell phone coverage, and considerably smaller volumes of internet capable devices per capita, further role out of Telehealth delivered services into patients' homes will require district wide investment in infrastructure and innovation.

CONCLUSION

A variety of service wide and individualised strategies have been employed to support safe and rewarding use of Telehealth technology within the Allied Health setting.

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HELPING AT RISK INDIVIDUALS ACHIEVE THEIR PERSONALISED CARE GOALS

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2. Whanau Tahi Ltd., New Zealand

INTRODUCTION

At Counties Manukau Health the model of care is being transformed to sustainably meet the needs of its population. A strategic initiative to improve patient outcomes and hospital utilisation by targeting high needs patients is the At Risk Individuals (ARI) programme. Established in 2014, ARI is one of the world's largest connected care programmes and already starting to achieve specific clinical goals.

USE OF TECHNOLOGY AND/OR INFORMATION

ARI is based around patient-led goal setting, a shared care plan, multi-disciplinary team working together and communicating with one another, and a flexible range of medical, social, and behavioural interventions. Whanau Tahi Connected Care (WTCC) underpins the process, providing an electronic shared care plan which the whole team, including the patient and whanau, can securely access.

Once enrolled by their GP, every person has a designated care coordinator responsible for setting personal goals in WTCC and monitoring progress in consultation with other providers of health and social services. Patient and whanau take greater responsibility for their own actions such as clarifying what a new prescription means, or monitoring weight gain, rather than waiting for intervention.

IMPLEMENTATION/PROCESSES

When Counties-Manukau Health set out to re-design its whole Model of Care, WTCC became an enabler for the associated clinically led change management that aims to focus care for those with long term conditions on meeting patient goals.

The ARI programme targets a specific group of around 60,000 patients with one or more long term conditions such as diabetes or heart disease, as well as other risk factors like inadequate housing or low health literacy. Following a nine-month pilot, full implementation of ARI across 99GP practices, was complete by late 2015.

Whanau Tahi contributed to the design of ARI and now, a representative sits on the ARI advisory board. WTCC also manages a User Group to contribute to strategy and hear feedback directly. WTCC, known as 'e-shared care' is licensed by Counties Manukau Health as part of a regional agreement enabling providers from across the continuum of care to access the solution, removing common barriers to adoption.

CONCLUSION

By April 2016, some 20,000 patients enrolled in ARI are receiving more planned, proactive care with care co-ordination and goal based care plans that are electronically shared with the care team members. Counties-Manukau Health expects this number to be 30,000 by mid-2017.

Care teams and individuals are demonstrating the benefits of making the mindset shift to greater self-management and enabling a patient's personal goals as well as meeting clinical needs. This includes more multi-disciplinary teams occurring within general practice cluster networks to support care planning for complex patients.

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DEVELOPING PATIENT-CENTERED TELEHEALTH OUTPATIENT SERVICES IN THE WAIKATO

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1. Waikato DHB, New Zealand

INTRODUCTION

The Waikato District Health Board is the 6th largest DHB in New Zealand, however it serves the largest rural population and provides tertiary healthcare services across the Midland region, with a combined population of over 850,000.

Delivering patient-centred healthcare in a highly rural environment with significant geographic and socio-economic challenges is not an easy task. High DNA rates for rural and regional outpatients coming to Waikato hospital only serves to increase the inequity in healthcare service provision to the rural population. This also reduces available clinician time that could otherwise be used to serve more patients.

Delivering healthcare services 'closer to home' using technologies such as Telehealth is a key DHB strategy in helping improve access to quality healthcare for patients, particularly in the rural setting.

USE OF TECHNOLOGY AND/OR INFORMATION

The Telehealth rollout project identified a standard configuration of Cisco-based hardware and software for use in a range of clinical and non-clinical settings, including Tele-Acute (ED assessment and remote clinician support, Inpatient virtual ward rounds), Tele-Ambulatory (outpatients) and Tele-Workforce support (staff meetings, training, supervision).

The project also reviewed current outpatient service models, administrative processes, clinical coding and data flows in related systems.

IMPLEMENTATION/PROCESSES

The Telehealth rollout project began in mid-2014, with initial planning covering a range of services and all four rural hospitals. Endpoint equipment was deployed in June 2015, followed by ongoing engagement with a growing number of clinical services eager to start utilising Telehealth. Of the 28 services approached, 8 are actively using Telehealth for outpatient appointments, with additional services commencing clinics mid-2016. These services represent a cross-section of centralised, rural outreach and regional outreach specialities, providing a comprehensive view of the challenges and opportunities for adopting Telehealth as a tool for enabling transformational change across the DHB.

CONCLUSION

Patient and clinician response to Telehealth clinics have been predominantly very positive, with several areas for improvement identified. While services have been able to successfully integrate Telehealth into their delivery model, standardising and streamlining processes is critical to adopting Telehealth as a business-as-usual delivery method across the organisation.

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THERE'S AN APP FOR THAT, AND THAT, AND THAT ... HELP FOR APP OVERLOAD

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1. Health Navigator Charitable Trust, New Zealand

INTRODUCTION

The health app market is growing exponentially with the development of over 100,000 health related apps. Knowing which ones are evidence-based and useful is challenging for both the public and health professionals. Health Navigator, a non-profit organisation that produces the Health Navigator website is currently working on a Ministry of Health pilot project to develop a NZ based health app library.

USE OF TECHNOLOGY AND/OR INFORMATION

In this instance, the use of technology has proven to be challenging. The proliferation of health apps in the mobile technology market has made it very difficult for consumers and clinicians to discern 'good' apps from 'bad' ones. Trying to ascertain the relevance of the app to the NZ health consumer is equally perplexing.

It has been challenging for us, at Health Navigator, wanting to make some inroads in reviewing health apps, to find a robust review process or tool. While there are Mobile App Rating scales or tools cited in the literature, none were found to be both clinician and consumer friendly.

IMPLEMENTATION/PROCESSES

We undertook a literature review to ascertain the existing criteria for rating health apps. The literature search revealed very limited findings, and following consultation with an App advisory group which comprised representatives from various sectors, we streamlined the review into 5 distinct aspects –user review, clinical review, technical review, formal review and a NZ relevance score, with each of these review paths have their own specific review criteria. While other websites have chosen to merge these criteria into a single score, we felt that to gauge the credibility of the app, each of these scores had to be reflected separately.

CONCLUSION

The outcome of the project is to organise review of an initial set of 40 health related apps and post online on the Health Navigator website to be displayed in a clear, easy-to-read manner that could be helpful to both clinicians and consumers.

Lessons learnt include the lack of a robust health app rating tool or review process that is both clinician and consumer friendly. During the project we received much interest from health professionals but had to limit the sample size of the pilot study to 40 apps. This indicates that there is a growing need for credible information about health apps.

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ELECTRONIC PRESCRIBING: MISSION DIFFICULT, BUT NOT IMPOSSIBLE

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INTRODUCTION

Exchanging folders of frequently illegible paper for an electronic medication chart available from any device is a wonderful vision, but the journey is complex. There are significant challenges that have to be overcome to make electronic Prescribing & Administration a success, but there is enormous potential to reduce patient harm through increased legibility, pre-defined order sets, and tailored decision support at the point of care.

USE OF TECHNOLOGY AND/OR INFORMATION

For a project that has often been described as 10% IT / 90% clinical change management, there is a surprising amount of technology involved. The need for mobility and a high degree of resilience brings additional layers of complexity, as the system needs to be available everywhere, all the time. Devices need to be kept secure, clean, charged, and above all, working. With a commercially available case, a custom designed magnet, and some creative use of magnetic stainless steel; we have created a workable solution at a fraction of the cost of products on the market.

IMPLEMENTATION/PROCESSES

Over the past three years, we have implemented 950 beds across Waitemata DHB's three main sites. Development of a national transfer chart allowed us to start in ED, and work progressively through the hospital over a period of months. Releasing busy clinicians for training is challenging, so provision of 24/7 support is critical. Planning for uncommon scenarios is important, as is having someone available who can make decisions when edge cases arise, as there isn't room for error. The risk of running paper & electronic systems concurrently is inevitable, but needs to be carefully managed.

CONCLUSION

Electronic Prescribing & Administration is the most complex of the CPOE systems to implement, and the clinical risk of failure is high. A successful rollout requires strong leadership, a vision of the future state shared by the executive & project teams, and the ability to translate this into benefits for individual clinicians, and communicate these effectively. If you get the balance right, you will help them successfully transition through the five stages of grief change to acceptance.

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MOBILE DEVICE SECURITY - GETTING THE BALANCE RIGHT

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INTRODUCTION

The ubiquitous use of mobile devices, such as smart phones and tablets, in clinical settings has resulted in a need for stronger measures that ensure the security of systems and data. Mobile devices pose unique security threats. Their size makes them easy targets for theft. Their features, such as audio and video capability, allow easy storage of new kinds of confidential information. And they are often used for both clinical and personal purposes, requiring new methods for securing patient data, while ensuring privacy for clinical professionals. These challenges are being addressed through both behaviour guidance and technical security measures being implemented across a set of New Zealand healthcare organisations.

USE OF TECHNOLOGY AND/OR INFORMATION

Recent technology provides a mechanism for securing information on mobile devices, whether they are provided by the health organisation or personally owned. However, this technology needs to be carefully configured to ensure that not only is clinical information kept safe, but that privacy of healthcare professionals is also protected. Creating a protective 'barrier' around clinical system access is one technique that can be combined with other mobile device security features.

In addition, behavioural guidance through organisational policy is needed to ensure staff follow safe practices when using mobile devices. For example, the collection, storage and use of images and videos must follow legislative and clinical record management requirements. Understanding both the behavioural and technical requirements is critical for successfully managing risk.

IMPLEMENTATION/PROCESSES

A number of vendors now provide technology to support mobile device security. Having the vendor work with clinicians who are early adopters of mobile applications ensures the technology is 'fit for immediate use', but also scalable for future applications. A mobile device standard, following the New Zealand HISO (Health Information Standards Organisation) security framework, provides a good foundation for healthcare organisation policy. Security awareness campaigns and online education support staff engagement. With this approach, configured security technology can be released and learnings from the initial release can be used to continue development, increasing scale and robustness.

CONCLUSION

A combination of technology and behavioural guidance is critical for ensuring the security of confidential information with a mindful awareness of privacy for healthcare professionals. Trialling an early adopter approach provides insights on the value of security awareness and change leadership to achieve these dual outcomes.

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EFFICIENCIES + TECHNOLOGY = OUTCOMES

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Due to increased pressure on bed availability and reduced inpatient length of stay, the DHB has been driving initiatives for improved levels of care in the community. This has impacted on all community services, and resulted in increased waiting times for community services including speech language therapy (SLT). As a result, the SLT team needed to develop service delivery efficiencies to optimise their intervention.

Both mapping of the patient journey and time in motion analyses were completed. Data demonstrated that demand exceeded capacity due to duplication, service criteria and non-value added steps. This resulted in the design and implementation of health pathways, online symptom management information, streamlined continuity of care, and improved access to technology.

These initiatives resulted in clients receiving timely management of their symptoms. Improvements in the appropriateness of referrals, case load management, and partnerships with primary care contributed to the success, with a dramatic reduction in waiting time, from 8 months to 4 weeks at the completion of the project.

One year on, data demonstrates that ongoing use of initiatives has enabled the waitlist to remain low. However, there is now an increased complexity of the current caseload given referrals are only for those requiring specialist SLT intervention.

The use of data and technology has enabled a more responsive service. Issues were identified: dual referrals and community access occurred within health pathways, limitations on technology around remote area access, and the need for ongoing education and support regarding the improvements. Further data analyses will look at the ways additional system developments can improve the timeliness of follow-up requirements such as onward referrals and the impact on subsequent services available for SLT clients.

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HEALTH-KIOSKS IN OUTPATIENT CLINICS - HELP OR HINDRANCE

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INTRODUCTION

Outpatient Clinics in Waikato and Thames have reported a rise in patient presentations over the past decade. With increasing loads, patient exposure to medical professionals is diminished and measurement of vitals is overlooked, leading to acutely ill patients being missed. Furthermore, increased waiting times have been perceived by patients as a barrier to access, thus are negatively associated with patient satisfaction but also compliance and comprehension. Overcoming such factors has been demonstrated to improve the efficiency of care.

USE OF TECHNOLOGY AND/OR INFORMATION

To keep up with the rising demand and maintain quality healthcare delivery, health-based kiosks were implemented in Thames ED. These easy-to-use touch-screen booths automatically record HR, BP, oxygen-saturation, Ht, Wt, and BMI but also incorporate screening aspects such as smoking. Previous studies have demonstrated enhanced delivery of health-care and patient satisfaction for asthmatics, UTI and HIV patients. In Thames, these kiosks improved patient vital-sign measurement and patient satisfaction. Furthermore, they revealed ample potential in reducing basic administrative tasks and enhancing staff satisfaction.

IMPLEMENTATION/PROCESSES

The kiosk was implemented in Thames outpatient clinics to improve vital-measurement recording and patient/staff satisfaction. Trends in vital measurement with the kiosk were compared to pre-kiosk implementation after a nursing educational intervention and post-kiosk implementation. Patients found the kiosks straightforward to utilize and enjoyed the experience. A positive trend in vital measurement was demonstrated. Patient and staff satisfaction-surveys revealed approval and satisfaction from use. Overall, trialling the kiosks revealed potential however their use was limited due to a lack of integration with the patient management system.

CONCLUSION

The kiosks conclusively demonstrated great potential in enhancing patient vital measurement. This would aid detection of acutely ill patients and improve patient satisfaction. Kiosks hold the potential of improving health-delivery via permitting more time with doctors and nurses by reducing administrative tasks. Furthermore, it can enhance health-screening for smoking and alcohol use but additionally form a platform for providing education and therapy. Integration with patient management software and acquaintance with health-professionals would be required to maximize their potential.

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Innovation Projects

The HiNZ Conference is a significant event in New Zealand's health system environment and this year also features the bringing together of four conferences into one main health technology congress all contained within one week. This provides delegates with a range of sessions to choose from; all of which are of high quality, informative and educational. The calibre of submissions has been extremely high which has provided the team of expert reviewers with a considerable challenge in going through the selection process. The result has been that the Innovation Project presentations will provide delegates with an in-depth view of some extremely innovative programmes being undertaken both in New Zealand and Australia. I wish to thank all those people who took the time to submit their projects for consideration, our team of reviewers who volunteered their time to do the reviews, and to deputy chair, Mitchell Pham of Augen Software.

Scott Arrol

Chair of HiNZ Innovation Projects Programme Committee



THANK YOU TO THE HINZ 2016 INNOVATION PROJECT REVIEW COMMITTEE

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PERSONALISED E-HEALTH PROGRAMMES IMPROVE MEDICATION ADHERENCE IN TYPE 2 DIABETES

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INNOVATION

This intervention study tests the impact of technology in increasing medication adherence amongst people living with Type 2 diabetes. The intervention is innovative in two ways – one, content was developed using Health Psychology theories and frameworks to provide targeted messaging to change behaviour; and two, content is delivered via multi-level accessible technology (text message, email and nurse-led telehealth).

CONTEXT

Adherence to oral hypoglycemic medication for Type 2 diabetes has been shown to be as low as 36% with significant implications for the individual and the public health system. Patient reasons for non-adherence are multiple, and have been consistently demonstrated to be associated with patients' beliefs about their illness and treatment. These beliefs are amenable to intervention either face-to-face or via digital technology.

Technology (e.g., SMS, internet, nurse-delivered telehealth) provides a channel for the delivery of interventions that are scalable and direct, as well as being capable of offering personalised and meaningful communications to patients. Technology also supports the delivery of healthcare to patients who are geographically remote, or lack resource to directly access healthcare via more traditional face-to-face means.

SOLUTION

A multi-channel intervention to lift medication adherence was developed utilising health psychology theories and frameworks, and information gleaned from patient focus groups. As face-to-face contact is not required for delivery, this intervention aimed to reduce geographical, financial, and other practical barriers that currently impact on healthcare access. This also makes the programme highly scalable, and could easily be replicated for delivery across the country.

The intervention was piloted with 150 users of oral hypoglycemic medicine aimed at addressing illness and treatment beliefs to lift adherence. Participants were randomly assigned to one of three intervention streams. All participants received 26 weeks of text messages and email education personalised to their illness and treatment beliefs. The medium- and high-touch streams received additional personalised intervention via nurse phone calls. Self-reported adherence was measured as an outcome with illness representation as a potential mediator.

IMPLEMENTATION

The programme was implemented utilising a proprietary CRM technology system that managed all personalised digital interactions. Nurses were trained in Health Psychology theories and frameworks to address individual patient beliefs with outbound calls. Patients self-enrolled via their dispensing pharmacy.

OUTCOMES

A significant change was found between baseline and post intervention reports of forgetting medication (41% vs 27%, $p < 0.01$). This change was maintained six months following the intervention. Illness representations also changed significantly with participants post intervention being more confident that their medication would be helpful ($p < .001$), less worried about using their medication ($p < .001$), and more likely to report a perception that diabetes was a long term condition with serious consequences if left untreated.

This pilot study shows preliminary evidence for the effectiveness of a text, internet and telehealth intervention in changing illness and treatment beliefs and increasing use of medications. The value of this intervention appears to extend beyond the intervention period with results maintained six months following the programme. Use of digital technology allowed scale, and enhanced reach for geographically isolated patients. Slow enrolment onto the programme hampered abilities to achieve a sample size with adequate power for statistical analysis.

NEXT STEPS

To improve enrolment onto the programme, recruitment will occur through Primary Health Care Organisations and their affiliated GP practices. These practices will text potential participants using Dr. Info. Those that text reply YES expressing an interest in the study

and consenting to their contact details being shared will be phoned, given more information about the study and invited to enrol. This enrolment method has the benefit of reaching greater numbers of participants in a shorter space of time and thus recruiting more efficiently.

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REVIEW OF THE NATIONAL DEPRESSION INITIATIVE TOOL THE JOURNAL AND DEPRESSION.ORG.NZ

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INNOVATION

The Journal is an innovative, online service for people with depression that has been serving New Zealanders well for some time as part of the National Depression Initiative, the public face of which is Sir John Kirwan.

CONTEXT

The Journal has now been in place for around ten years. This review provided an opportunity to document the background and successes of The Journal, and contribute to planning for future development and evolution. The review was funded by the Health Promotion Agency.

SOLUTION

A review was undertaken to examine the input of service users, producers/providers and potential referrers to The Journal, an online eMental Health tool that forms part of the National Depression Initiative. The review examined documentation on development and previous evaluations of the service, national and international literature on effective eMental health Services, and an examination of comparable services and initiatives in the global market.

IMPLEMENTATION

In total, input was obtained from 680 participants. Active users of The Journal over the past twelve months were invited to participate, and 620 completed surveys were returned. An online survey was completed by 42 potential referrers, and some of these also completed face-to-face interviews. Finally, in depth interviews were conducted with 18 people who were producers or providers of The Journal to obtain their perspectives on strengths of The Journal and areas for further development.

OUTCOMES

The implementation of the EMRDA group has been paramount to engaging clinicians across the organisation and providing evidence for senior Executives and Board to understand that this project is pivotal to providing safe patient care. The data gathered during the EMRDA process supports a logical road map forward to business case development and implementation; resulting in support from Senior Executives for the next phase of this project and inspiring many clinicians to become actively involved in Mercy Health's EMR journey.

Users, producers/providers of The Journal and referrers were positive about the value of the service, and reported experiencing benefit from using it. They provided a range of ideas for extending and enhancing the system. The overall feedback was The Journal is a system that users and other stakeholders were reporting was worthwhile, and worth further developing. Recommendations for further development included consideration of the addition of user coaching, likely using a telehealth approach, undertaking ongoing usability testing, and exploring closer integration with primary health services. Implementation of an ongoing programme of content review and development was recommended, as well as a programme of formal research to document the effectiveness of the existing service, and examine incremental changes in this as new components are added. We recommended a broader focus beyond depression be considered, examining how the existing tools could be adapted to cater for people with other mental health conditions. We recommended examination of how both content and the look-and-feel of the system could further reflect the diverse cultures in New Zealand, and particularly Maori, Pacific and Asian cultures. Recommendations were made to work towards a modular and loosely-coupled underlying architecture to most effectively enable implementation of the other strategic developments outlined.

NEXT STEPS

Further development of The Journal is already underway, moving to a mobile responsive platform to which other developments can be added. The Health Promotion Agency is supportive of the recommendations in this review and are considering implementation options.

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SUPPORTING CLIENTS NOW AND IN THE FUTURE WITH SOCIAL AND INNOVATIVE TECHNOLOGY.

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INNOVATION

The evolution of emerging and innovative technology means that there are now a wide range of new devices and services appearing on the market. A stratified process has been designed to test available technologies and match them to the needs of older people. This process is innovative in its design and contributes to the challenge of ensuring that through technology, people are supported to live safely, independently and meaningfully in their own homes for longer.

CONTEXT

Globally the population is ageing, with the proportion of people aged over 65 years rising. In our region, the number of people aged 65 to 84 years is expected to more than double and the number of people 85 and over more than quadruple. To minimize the social and economic cost of caring for an aging population, there is increasing pressure for industry to be able to provide support and services to allow people to stay in their own homes. The challenge therefore is to provide new technology, products and services to allow people to be safe, supported and connected while living independently. Emerging and innovative technologies have the potential to create a new paradigm in aged care service provision. They can be seen as key enablers used to transform the services provided in many homes and communities. Many products have been developed by manufacturers, however the benefits and suitability of these products to address the needs of older people needs to be ascertained before they are recommended widely.

SOLUTION

Feros Care has developed a stratified process to research, review and test all products before offering them to their aged care clients. A product or service only progresses through each stage of the process if pre-ordained performance indicators are met.

IMPLEMENTATION

When reviewing a product or service the following process is followed:

- SCOPE – Assessment of whether an unmet need or improved efficiency is provided. If the product or service exceeds currently assessed devices, it proceeds to Beta Testing.
- BETA TESTING identifies core functions of the product and examines the user experience. Testing is performed with staff familiar with the product type or field of application.
- USER ACCEPTANCE TESTING (UAT), scope of use is established in consultation with management and staff involved in Beta Testing. Client feedback is collected from a small group of older people who volunteer for this stage of the process. On completion of the UAT an informed decision is made on market fit and perceived outcomes, to proceed with the product to Field testing.
- FIELD TESTING – Volunteers from the community are involved in the field test to assist in assessing the potential impact, usability and potential outcomes for older people.
- MARKET – Following a successful process, products are taken to market for our clients.

OUTCOMES

Independent studies that have shown that the technologies moved to market can improve the likelihood of clients being able to remain safely in their own homes for longer.

- 80% of Clients reporting that the technology improved their quality of life;
- 69% of Clients reporting being less concerned about the daily severity of their condition;
- 44% of Clients feeling that they need to visit their General Practitioner (GP) less frequently;
- 44% of Clients feeling that their quality of life has improved relative to the beginning of the program.

NEXT STEPS

In order to ensure that people do not become socially isolated if they are able to safely stay in their own homes, Feros Care is now working

on an innovation to increase social connection using technology.

The development of Smart Phones, IPad's, Android devices, and Smart Home Hubs have also broadened the solutions that need to be offered to our clients.

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DYNAMIC, INTERACTIVE, ELECTRONIC ACUTE ADMISSION DOCUMENT

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INNOVATION

Created a dynamic electronic admission document for patients admitted to the medial ward in Rotorua. The document contains the relevant sections for both the doctors and nurses' documentation decreasing the workload of the user. The document changes in both the overall size as well as the included sections based on the needs and inputs of the user allowing significant flexibility. The document provides guidelines depending on user input and also allows for the creation of referral forms to the multi-disciplinary teams.

CONTEXT

Prior to the creation of this project there was no single document used for admission to the medical ward in Rotorua and no standard format for admissions. Admission documents, both medical and nursing, were not stored electronically against a patient's admission but rather only appeared within the patient's physical notes.

The problems observed when trying to create a physical document which could be used for all types of medical admissions plus nursing admission documentation, mainly revolved around the length of the document and ease of use. To allow enough room for complex admissions as well as all potentially required examinations for all patients, the document was unusably long, creating difficulties both in filling out and reading the document.

Nursing documentation is complex with many scoring systems, the outcomes of the scores would then determine further actions for the nursing staff. This process was not streamlined and subject to error given the complexities of certain forms.

The Existing referral pathway to members of the multi-disciplinary team required hand written referrals to the appropriate service, with no standardised referral criteria, which could lead to incorrect or inappropriate referrals to busy services.

SOLUTION

An interactive document was created which grew and shrank depending on the amount of information the user wanted to include. Certain sections of the document which were not always required could be removed or, if not filled in, would not appear when the document was printed or saved as a final version. This kept the document to a usable, and readable, length. However, sections which were deemed critical for an admission would need to be filled in otherwise the document could not be printed.

The document included easy to use electronic versions of the nursing checks and scoring systems. The electronic versions of these documents helped the end user by totalling the scores automatically depending on the entries, and also providing guidelines on what to do with the final score.

Should certain members of the multi-disciplinary team be required for a patient, the document could create a letter to the desired service, providing guidelines on appropriate indications for referral. If a specific indication was selected, the generated referral letter would self-populate with an appropriately worded request which could be altered by the end user.

IMPLEMENTATION

Once the document had been created it was rolled out for use by both the medical and nursing teams when admitted a patient to the medical wards in Rotorua hospital. Training was done for the end users on the document, both for doctors and nurses.

OUTCOMES

Outcome: The document was used for all admissions to the medical unit in Rotorua hospital. The document is uploaded against the patient's admission event.

Lessons Learnt: Ease of use of a document is key to uptake by users, both those who completed the document and those who subsequently read it.

Appropriate training is required when there is a change to the standard service.

Change in important process takes time to embed.

NEXT STEPS

Thoroughly embed within the services including uploading of all admissions. Nurses to use handheld devices to complete their portion of the document at the bedside. When use is consolidated within medical services roll out across other services.

Incorporate the functionality of this document into the new electronic health record and whiteboard system in development in the North Island, including electronic referrals to other members of the MDT.

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MAXIMISING SURGICAL AND PATIENT OUTCOMES THROUGH BETTER ENGAGEMENT AND EMPOWERMENT OF PATIENTS TO SAFELY SELF-MANAGE OUTSIDE OF THE HOSPITAL AND CLINIC WALLS

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1. SHI Global Limited, New Zealand

INNOVATION

A cloud based software platform, optimised for mobile, tablet and computer, that surgeons and hospitals use to support their patients to safely self-manage at home. The tools within the platform provide multiple avenues to strengthen patient engagement and equip and support them to optimise their outcomes before and after surgery. The platform was designed so that the patient's entire care team inside and outside the hospital or clinic can interact with the patient and their care plan no matter where they are located.

CONTEXT

Surgeons and hospitals are under increasing pressure to reduce costs, improve patient outcomes and quality of care and move from fee for service to value based care payments. Surgeons explained that that they could only make small incremental improvements within their surgical process and that medical devices and implants are all very similar so the greatest impact they could have on improving outcomes was through strengthening patient engagement and empowerment to self-manage before and after surgery, reduce variations in outcomes and provide consistent care outside of the hospital setting. The problem was how to do this effectively without escalating costs, at scale and without further burdening staff resources.

SOLUTION

We developed a patient centric, cloud based solution that delivers individualised, time lined care packages that clinical teams can build as generic care packages. In minutes these care packages can be individualised and delivered to the patient with interactive content strategically placed along a time line ensuring the patient receives the right advice, activity and support at the most appropriate time along their surgical journey. Because the solution is a single, cloud based platform care teams inside and outside the hospital can interact in real time with the patient and their care plan no matter where they are located reducing conflicting advice and more consistent care. Outcomes can be measured, reported and care plans easily updated as required either for an individual patient to suit their specific needs or as a generic care plan as new learnings come to hand. To ensure all the care team, the patient and their support can stay securely connected with each other we built an encrypted communication module within the platform.

IMPLEMENT

To prove the concept, we worked with an orthopaedic surgical team using our software to deliver their care plan to over 300 hip replacement patients. Each patient received a personalised interactive care plan three weeks before surgery and six weeks afterwards which they accessed on their internet enabled device.

OUTCOME

Over 80% of these patients followed their care plan on a daily or weekly basis; over 90% said their care plan significantly helped their recovery; over 95% were confident to care for their wound and spot any potential issues; over 60% did not need all the physio clinics allocated.

Patients want to self- manage and are more ready than clinicians to embrace technology. Patients successfully engage with online rehab plans. Patients were less anxious and better prepared for surgery. The surgical team totally embraced the program when they realised its impact on outcomes. Fewer complications occur when consistent care is provided to patients beyond surgery, particularly those who have difficulty accessing services or live in remote areas.

NEXT STEP

To expand the uptake of our solution to surgeons and hospitals ready to embrace technology to maximise the outcomes they are seeking for themselves and their patients. Extend the use of the platform beyond orthopaedic surgery to other elective surgeries.

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DIGITAL COMMUNITY CARE MODELS – THE NEW HORIZON IN HEALTH AND COMMUNITY CARE

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INNOVATION

The overarching aspiration of this innovation was to develop a digital health service model that could be implemented nationally to improve client outcomes, build upon a positive client experience and reduce costs. Integrated digital platforms were recognised as playing a significant role in our organisation's ability to provide proactive and responsive care and support to clients where and when they need it. We prioritised the development of a technology based service model that would improve efficiencies and better support our remote workforce, operational decision making and service delivery.

CONTEXT

With 45,000 clients across a large geographical footprint, our organisation has been committed to developing and implementing a digital transformation in community care that uses customer led design techniques to:

- Deliver on a service promise to customers for individualised, timely and responsive care
- Improve health outcomes and quality of life for clients and their carers
- Co-ordinate and manage workforce and service partners efficiently
- Increase staff capacity and reduces costs.

SOLUTION

An Innovations Centre for was established for technology development, deployment and training. A new digital service model was then developed that incorporated:

- A Community Gateway to provide centralised co-ordination of service delivery nationally
- An OMNI channel communication platform that allows stakeholders select their own customised service
- A mobile Community Team utilising virtual offices and cloud based applications.
- A Business Intelligence Team providing clinical and service data, reporting and analytics in real time
- A Virtual Care Centre providing telehealth and remote monitoring by clinical and medical staff
- Online Learning, collaboration, innovation and project management.
- Online Virtual Communities including our Virtual Senior Centre and Virtual Wellbeing Centre
- Logistics and scheduling platforms for efficiency of service co-ordination

IMPLEMENTATION

To create our business intelligence, logistics and IT development expertise, we took a step back to ask our clients about their service experience, identifying their hurt points and forming solutions that would become our key point of difference. To achieve this, we worked closely with business analysts, and consumer experience specialists to conduct ethnographic research using participatory design methods to develop a roadmap for our technological innovations.

OUTCOMES

Utilising this targeted and strategic approach, our organisation has: improved net promoter scores for client satisfaction (faster decisions on service changes, improved communications); improved staff satisfaction (improved rostering, communication on service changes, better information); reduced inefficiencies (minimised mileage travelled for community staff, reduced missed service sessions); increased referrals for services (client acquisition) and improved client loyalty (client retention).

NEXT STEPS

Our next steps are to:

- Further develop our OMNI channel experience where customers can "self-serve" by choosing their own types of services, staff member, times and days of service delivery. This will allow them to manage their own service budget through the further development of their online portal and apps.
- Extend the care team environment through the use of social media tools so that all can interact through the use of a secure social media platform.
- Continue to build a knowledge system for our centralised operations staff so that they can be the one point of contact for most

information about aged care, services and supports, that provides the information and making decisions in a timely manner.

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BETAME - DIGITAL PREDIABETES SELF-MANAGEMENT PILOT

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2. Pinnacle Midlands Health Network, New Zealand

INNOVATION

BetaMe is a digital health programme developed by Melon Health, to help people diagnosed with pre-diabetes better understand and manage their health. The 16-week self-management programme combines peer support, health coaching, access to nurses and behaviour change tools to build daily habits which result in positive health outcomes. At the end of 16 weeks, participants transition to a 12-week maintenance programme where they receive ongoing support, education and encouragement. Melon Health in partnership with Midlands Health Network delivered a 28-week pilot of BetaMe with 117 patients in the Waikato region in October 2015.

CONTEXT

Pre-diabetes is a major health concern in New Zealand yet there are few programmes available to primary care to offer patients. The latest diabetes strategy estimates approximately 20% of NZ adults have pre-diabetes with 70% of those likely to develop Type 2 diabetes. The BetaMe pilot was trialled as a self-management programme to augment usual care and support patients to take control of their health.

SOLUTION

BetaMe is a 16 (+ 12) week digital self-management solution delivered on mobile and web. The programme is modular based providing patients with 8 x two weekly modules focusing on lifestyle behaviour change relevant to pre-diabetes combining health psychology principles. Each participant receives an initial one-on-one session with a coach incorporating motivational interviewing techniques to tap into each individual's motivations for change.

Core to the BetaMe programme is:

- peer support, where people can connect with others on the same health journey (monitored by a clinically trained community manager)
- health coaches who are available for one-on-one coaching through video or audio
- health tracking including physical exercise tracking, a food diary and mood tracking
- nudges, reminders and positive reinforcement
- motivational interviewing and goal setting
- engaging resources,
- integration with primary care via access to clinic nurses using direct messaging or one to one
- audio-visual sessions and a clinician dashboard showing patient progress
- Integration with wearables and bio-metric sensors

IMPLEMENTATION

- Midlands selected 3 clinics in Hamilton to participate in the pilot
- Midlands and Melon agreed on pilot objectives, patient numbers and outcome measures
- Midlands and Melon conducted a workshop with participating clinic staff to work through best approach for recruitment/enrolment.
- As the programme was to be delivered over Melon Health's secure platform, Melon trained nurses on the platform.
- Health coaches were then recruited and trained.
- Patients were identified and enrolled onto the programme over an 8-week period.
- Patients were required to go into practice and have baseline measures taken (Weight, HbA1c, BMI, Waist Measurement and Blood Pressure)
- Once enrolled a health coach contacted each patient and welcomed them onto the programme, conduct a myHealth survey (PAM score), introduced them and encourage them to engage with the community and orientate them around the app.
- At the end of the 16-week core programme, patients returned to the practice for rescreen of clinical measurements, PAM score and survey of programme satisfaction.

OUTCOMES

1. It's important to have the programme accessible on all screens (mobile, tablet and desktop) as people interchange between them and use them differently.

2. Being a pilot, there was a significant time delay from when the first person signed up and when the programme started. Because of this, some people were disengaged and we had to re-engage them. Going forward we're enabling people to start on any Monday.
3. Nurses were initially concerned they'd be contacted by patients via the platform regularly. This didn't happen because the patients received adequate support from the programme.

Outcomes of first 72 patients - the key measures:

- Measure Improvement Average reduction in measure
- HBA1c 91% reduced HBA1c 2.6 mmol/mol
- Weight 94 % lost weight 4.2 kg
- BMI 94% reduced BMI
- Waist Measure 87% reduced waist measure 4.2 cm
- Pre-diabetes 78% no longer have PD
- Blood Pressure 59% now have normal blood pressure

NEXT STEPS

Midlands Health Network were very satisfied with the results of the BetaMe pilot, and the programme is now being rolled out to other regions around New Zealand – Tairāwhiti and Taranaki.

Meloni are also in discussions with other PHOs around the country.

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HOSPITAL AT NIGHT: BETTER FOR STAFF ... BETTER FOR PATIENTS

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INNOVATION

We recognise that hospitals function differently at night and after hours, and after partnering with two large tertiary quaternary hospitals in Australia we have tailored a technical solution to support and assist in ensuring safe, quality and advanced care for patients after hours and at night.

Driving safe quality care after hours.

- Mortality = 10% higher for patients admitted on weekends
- Our tailored 'hospital after hours' solution enables improved communication, visibility, transparency and addresses the 'siloed' culture that exists after hours that leads to poor team dynamics and poor patient outcomes
- Innovation partnership with two tertiary quaternary hospitals in two different states in Australia achieving enhanced patient safety and a cohesive team culture
 - 30% decrease in after-hours medical emergencies
 - 50% decrease in code blue cardiac arrests
 - Junior doctor night shift sick leave halved within 6 months
- Focus on safe, transparent and effective clinical handover
- Identification and reporting of 'Patients of concern'
- Task management and workload management and clinical prioritisation for medical staff

CONTEXT

Health Roundtable literature has published mortality rates are 10% higher for patients admitted after hours and on weekends. Two large tertiary quaternary hospitals in Australia had identified that patients admitted at 10pm were not receiving the same care and attention as those admitted at 10am. There was a disconnect in communication between day and evening/night staff leading to ineffective clinical handover, unnecessary delays in diagnosis, treatment and care; repeated tests, missed or delayed communication of test results; and incorrect treatment or medication errors.

Especially concerning was the impact the lack of processes and disconnect of communication had on the staff, and on how they worked together and the overall culture after hours.

Specific problems experienced by both included:

- Patients were delayed in their access to care;
- There was a lack of progression of patient care overnight;
- Hospitals shifting into "transition mode" at night, becoming temporary custodians of patients instead of caretakers;
- There was a lack of visibility over the current workload for each doctor and an inability to prioritise workloads.
- Insufficient communication between daytime and after-hours staff;
- The absence of standardised clinical handover processes;
- An inability to identify and prioritise patients of concern; and,
- A tendency to rely on emergency responses to after-hours medical emergencies (MERTs) rather than prevention.

SOLUTION

The right technical solution to support improved patient care, communication and culture change had to:

- Strengthen communication between doctors, nurses, operational staff, access/bed management
- Eliminate dependence on manual processes, and implement technology to support staff.
- Provide a single, comprehensive framework for standardised after hours processes;
- Provide a single source of truth to capture and access all patient status information;
- Allow clinical staff to easily identify and prioritise patients of concern;
- Leverage existing systems;
- Be easy to use to ensure a higher level of compliance by all staff; and
- Be customisable to the hospital's specific requirements.

Software

- Patient of concern functionality to flag a patient's of concern (often defined as patients with high risk of deterioration outside of a Critical Care environment) and capture relevant information including but not limited to; risks, required actions, follow-up tasks, review times.
- Highlighting these patients to relevant staff through automatic notification, handover reports, patient journey boards and patient lists
- Fully integrated task management for junior doctors including the ability to job request, prioritise, automatically notify, reallocate depending on criticality and staff availability, plan resources and visualise overall workloads.

IMPLEMENTATION

As long term partners with these hospitals we embarked on an innovation journey to develop the system together utilising the existing software platform.

The system was designed together with the hospital teams and our healthcare consultants. Support was provided 24/7 to ensure any real time feedback or issues experienced by the staff on the ground overnight and at weekends could be addressed in a timely manner and they felt supported when transitioning to using new technology.

OUTCOMES

Technology designed by the staff who will be using it ensures it is a powerful tool to support process change and improve patient care and safety.

Specifically, our customer partners achieved;

- Increase in patient safety
 - 50% reduction in cardiac arrests; and
 - Increased clinician engagement and movement away from silos to integrated teamwork, as evidenced by HMO sick leave reducing 50%
- A 30% decrease in the number of after-hours MERTs recorded;
- 100% compliance by doctors when recording and monitoring patients of concern using the solution;
- All after-hours MERTs are reviewed every morning by the daytime clinical staff;
- A cultural change involving improved communication and collaboration.

NEXT STEPS

The addition of predictive analytics will allow several further innovations such as:

- Allow tasks to be automatically assigned to the most clinically relevant staff member who has capacity, so include automatic load balancing while maintaining clinical relevance.
- Ability to look at what resources will be required overnight days in advance based on the predicted patient and associated task workload.

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USING TECHNOLOGY TO ADDRESS CONNECTED HEALTH NEEDS FOR CALD PATIENTS

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INNOVATION

Our innovation involved developing a culturally and linguistically diverse (CALD) in-home monitoring connected health solution, including both text and spoken formats to accommodate older and disabled patients.

The connected health solution allows patients to manage their condition/s from home by taking their vital signs and answering a series of health related questions on a regular basis. These details are then automatically transmitted to a patient management system where registered nurses monitor patient's readings, comparing the data to the patient's 'normal' readings and flagging any abnormal readings for follow up by the patient's care team.

CONTEXT

Having conducted numerous connected health research projects and programs over the past eight years, one of the issues we came across regularly was the inability to support CALD patients where English is their second language.

One of the challenges with developing a multi-lingual system is managing multi-byte languages. Until recently, our connected health system was not designed to handle multi-byte languages.

SOLUTION

Our first generation connected health hub does not support multi-byte languages, however does support jpeg files, so we were able to create health questions and prompts in, for example, simplified Chinese text, and then convert it to an image.

With this issue in mind, we developed our software and designed our next generation patient management system to enabling multi-byte language and a file structure to enable easier translations. We have now designed connected health programs that take in to account patients who prefer to communicate in a language other than English. The introduction of our newest connected health hub, using touch screen Microsoft windows based tablets, also enabled the health interview, prompts, and kiosk imagery to be easily displayed in any language other than English.

IMPLEMENTATION

Our windows based connected health system supports both text and spoken versions of the health interviews through text files that are coded and linked to a corresponding .wav voice recording. When we need to translate a health interview we first break down the components of the English version and associated coding, and send to an experienced medical translation company to have the text translated. We then source a third party with a clinical back ground, who can speak and read the language, to review the translated files. This process enables us to identify particular words and/or phrases that can have multiple meanings to ensure the interpretation is correct. Once the text is finalised the voiceover is recorded and linked to the corresponding text. The whole interview text and voiceover is then checked against the English version, again using a third party reviewer, and then finalised and published to our system.

Another challenge that we came across in developing a connected health program to support CALD patients is that sometimes their care givers do not speak or read the language, or more commonly, younger family members can speak the language but can't read the language. To accommodate this requirement, we have further developed the health interviews to incorporate both English and the second language in the text mode.

As the registered nurses who provide clinical support for telehealth programs are English speaking, our patient management system translates patient's responses to the English variant.

OUTCOME

Currently our connected health system has three standard core health interviews (CHF, COPD and Diabetes) translated to Italian, Chinese text (mandarin spoken), and Arabic. These were predominantly developed for a hospital avoidance program in Western Sydney, and are now available as standard for all of our other connected health programs. While the numbers of actual patients who are using the multi-lingual system are still quite small, it has been well received and positive clinical outcomes for the patients and support for their care givers have been achieved.

NEXT STEP

We are working on a fully translated patient management system for a program based in Asia, where both patients and the clinicians speak a number of dialects.

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TQUAL, THE MIDLAND RELATIONAL TRAUMA DATABASE

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INNOVATION

Midland Trauma System is developing a relational database, named TQUAL to merge trauma registry data with data from other organisations in order to precisely identify risk factors for injury, identify systems and processes that are suboptimal or wasteful, and measure and streamline the provision of clinical care to reflect best practice. The end goal is to reduce the burden of trauma on our communities.

CONTEXT

Traditional trauma registries collect a limited set of data that is available from the hospital records of admitted trauma patients. Given that demography, geography, system and processes, ethnicity and social circumstances all have a profound impact on how trauma occurs and how we respond to it, we have a need to match up these data to more accurately describe the whole patient journey, not just the part we see in the clinical setting.

Early trial data matching of diverse data have revealed patterns of injury and impacts on the health system that we have not seen in detail before. Use of Qlik Sense has allowed stakeholders to understand the impact of trauma on their business and the community. We are helping responsible DHBs and community agencies to target issues with precision and efficiency.

This has had significant benefits for MTS in demonstrating how it is delivering on its business requirements to maximise the use of regional trauma registry data.

With these successes it became apparent that a system was required to handle data whilst giving contributors and end-users a good experience in loading and accessing data for their needs.

SOLUTION

Following early successes in merging trial datasets manually our solution was to build a SQL-based relational database, named TQUAL, to merge, match, analyse and visualise data from many sources. It was required to have the following capabilities:

- Compliance with all relevant local and national standards for data security and privacy
- Allow automated downloads from the existing web-based XML registry
- Enable a secure, outward-looking, password-protected common node for users.
- Support a range of web-based and mobile data inputs and outputs
- Duplicate and split data into "real-time" reporting and analytic streams
- Enable a range of analytic and visualisation tool in the common node
- Provide a range of inbuilt data quality and reporting tools to optimise management
- Enable automated data quality and volume reporting
- Enable rapid access of stakeholders to their own data.

IMPLEMENTATION

Following trials on data matching and visualisation to test proof of concept, business requirements were defined and a business case was submitted and approved by Waikato DHB to build and support the TQUAL platform. Development has involved significant clinical input and engagement of multiple stakeholders to determine their needs, develop governance rules and define the technical factors involved in data input and output.

OUTCOMES

Regional DHBs and external groups involved in community safety or post-event clinical care have asked for detailed information to allow them to do their work. To achieve this we were required to step outside the clinical realm to consider other factors that impact on the burden of trauma on the community. By taking a broad, community-based approach, the appeal and uses of the information is optimised and the support base for innovation and outreach has broadened.

NEXT STEPS

Once TQUAL is completed to full specification, the platform will be customised to meet the specific demands placed on it by end-users. The infrastructure around it to support research, reporting and education will expand to manage expectations. The ideal next step for

TQUAL is to provide evidence of its own effectiveness and gain support for further development into new realms in health care and disease prevention.

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DATA EXTRACTION FROM AN ELECTRONIC PRESCRIBING AND ADMINISTRATION SYSTEM

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INNOVATION

This project designed and developed a process for extracting clinical data from electronic prescribing and administration (ePA) software. This facilitated reporting of high dimensional data stored in the process of clinical activities

CONTEXT

MedChart® is the nationally-mandated electronic prescribing and administration (ePA) software in New Zealand public hospitals. While there are several advantages to ePA, without an adequate reporting framework, accessing and analysing medications data is not possible. Canterbury District Health Board (CDHB) rolled-out the ePA between 2014 and 2016. To maximize benefit from ePA adoption, a reporting framework to extract data from MedChart® was developed

SOLUTION

CDHB developed a process to extract clinically meaningful data and data relationships, led by a clinical informatics team. The clinical informatics team was comprised of members of clinical staff from Clinical Pharmacology and technical staff from the Information Services Group to provide both subject-matter and technical expertise. The project had strong executive support and clinical champions. Stakeholders were consulted and user stories were developed to define the functional requirements. A test-driven iterative process was used to refine the data extracts and data relationships to ensure that they met functional requirements.

The quantity of data being produced by the ePA system grew rapidly as the system was rolled out. Several front-end presentation systems were evaluated before we finally settled on our current solution

As an intermediate measure a pseudo data warehouse data model was created. An ETL process is used to extract new and changed records, transform them by performing any upfront calculations and additional data lookups before loading the result into the pseudo data warehouse. This resulted in increased query response, especially as the data volume grows. Long term it is intended to merge this pseudo data warehouse into an existing one and therefore it is important to maintain critical linking identifiers

IMPLEMENTATION

This process developed a standardized set of extract that encompassed the major groups of clinical data held within MedChart®. These include: data related to prescribing; data related to administration of medicines; adverse drug reactions entered by users; clinical decision support alerts; and user actions.

OUTCOMES

Clinically meaningful data are being extracted from the ePA within CDHB. Developing extracts was clinically and technically demanding, and required time investment by both clinical and informatics experts. It took time to develop communication between these two disciplines as interpretations of data were different. Further, relationships within the data were not always intuitive.

CDHB collaborated with the vendor to gain access to the data dictionary and data structure. The source documentation had limitations requiring extensive iterations and clinical-technical discussions to determine data relationships. In particular look-ups to XML tables or configuration files were difficult. The clearly defined iterative process and co-location of experts was critical to the refinement process.

NEXT STEPS

The extracts generate large volume data (approximately 160 MB) via scheduled updates. The system architecture will be moved to a more stable platform, housed within the CDHB data warehouse allowing linkage to other clinical data sets. The extracts will be shared with other DHBs and a single national process for development will be established once requirements have been determined. A standard set of post-processing analytics and reports to meet the requirement

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PATIENT INFORMATION LEAFLETS: THE DIGITAL TRANSFORMATION TO MYMEDICINES

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INNOVATION

Transforming medicines information leaflets for patients into a digitally-capable content provision for New Zealand.

CONTEXT

Patient Information Leaflets (PILs) is a library of medicines information leaflets designed to be understood by 90% of the New Zealand adult population. It was created by the Canterbury District Health Board (CDHB) Clinical Pharmacology and Pharmacy departments. It has been available on a subscription basis to New Zealand health professionals since 1995. The library contains over 400 leaflets, which were generally used as a printed copy to help health professionals counsel patients about their medicines. The library was maintained both in Word documents and in a restricted content management system (CMS), and distributed via PDFs and XML export to a number of organisations. This created duplication of work and strained limited resources. A new distribution partner, the New Zealand Formulary (NZF), provided additional resources and an opportunity to develop new processes.

SOLUTION

The problem was redefined and agile-based user stories were written. It became clear a CMS was needed to house all the content, while allowing the MyMedicines editorial team to easily adjust the commonly-used content across the database without the input of a development specialist. This CMS would publish content to a publically available website, allowing a single distribution channel to increase the efficiency of providing content to multiple distributors, as well as making the information available to all New Zealanders.

IMPLEMENTATION

The CDHB's Community and Public Health Division developed the CMS as a multi-tier web application using Microsoft ASP.NET MVC and SQL Server. The system was divided into production process stages (Draft, Update, Approval, and Published), with audit traceability at each stage. Commonly-used content was incorporated into look-up values that are able to be amended by the MyMedicines editorial team. Each look-up value has a list of the sheets it is included in to allow the editorial team to maintain consistency across the database. Content is published to the publically available MyMedicines website (www.mymedicines.co.nz). A persistent URL is maintained for each sheet with online, A4 PDF, and A5 PDF versions available with NZF (main site) or CDHB branding. Online sheet content is mobile-device friendly, using the Bootstrap responsive user interface framework. An XML export function was maintained for distributors incorporating content into third-party software.

OUTCOMES

The content of the MyMedicines library was populated into the CMS. The first 89 sheets went live in April 2016 with 8159 views between 1 April and 20 June. Initial uploading of the content occurred during the initial integration into the NZF, which involved joint content review prior to publication. The project needed to provide content to existing distributors and allow the MyMedicines editorial team to work solely within the CMS. The full database was published to the CDHB-side of the website and the project is on track to complete publication to the NZF branded sheets.

NEXT STEPS

Once the CMS is fully published, time previously allocated to administration and publication of the database can be repurposed to development of content. The functionality of look-up values is allowing review of the database for consistency of terminology. User feedback and monitoring of published literature are being used to enhance the project offering. Approaches to widen the service offering and use the effective structure of the CMS for other projects at the CDHB and nationally are being considered.

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USING THE FAMILIAR TO DO THE UNCOMFORTABLE

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INNOVATION

The District Health Board (DHB) has had a highly successful eReferral system for some years. The success has been based upon the system's simplicity from an end user perspective.

We wanted to leverage off the success and familiarity of this system to promote feedback to the hospital system from Primary care about performance.

A generic eReferral form was added to the platform for primary care clinicians, GPs and nurses, to use to inform the hospital about any issues with patient care from either a clinician or patient, family/whanau perspective.

The submitted referrals are managed by the DHBs Quality Improvement Directorate. The outcome of the investigation is communicated via a range of methods; messaging via the referral management system, dictated letters and phone calls.

CONTEXT

The problem we were trying to address was the under-reporting of hospital system issues with missed opportunities for system improvement.

Under reporting was occurring for a number of reasons.

Primary care clinicians, like their secondary care colleagues, have traditionally not been comfortable providing formal feedback due to negative connotations associated with "complaints".

There was also the barrier of no clear pathway to provide feedback.

The advent of the GP liaison (GPL) role had partially addressed this later issue but with this was not sustainable or an efficient use of this limited resource.

Our aim was to provide a simple, non-person specific method for feedback that was part of the normal workflow of the clinician. The hope being that if we removed one barrier to feedback we would have the opportunity to change the cultural barriers to feedback, allowing us to move towards a learning system.

SOLUTION

The simple generic referral form used to refer to clinical services was adopted at a cost of \$600.00. It was able to be delivered within weeks of approval.

The form was called: Hospital Adverse Event. The word complaint was consciously avoided. The form was made available for use by all primary care clinicians, GPs and nurses.

A system was set up with the Quality Directorate who then became responsible for managing the referrals, the actions around them and the response to the referrer.

The complaints are entered into the hospitals adverse event system (Datix) to allow for trend reporting to identify areas where service improvement projects may be required.

IMPLEMENTATION

The announcement of the new eReferral and the rationale behind its development was via the GPL newsletter to Primary care. It was promoted via this method on a number of occasions and also via conversations with GP colleagues by the GPL.

OUTCOMES

Since the implementation there have been 116 notifications from 48 unique referrers.

The use of the eReferral as a clear, simple and quick method of providing feedback has been valued by Primary Care clinicians based on a recent survey.

However, we have found there are other key success factors that must also be present.

These include:

- Promptness of acknowledgement and reply
- Quality of response which includes whether any meaningful change will be occurring.

NEXT STEPS

Further work is being done to assess the quality of the responses to ensure value to the referrer and ensure maximal learnings are being extracted by the organisation.

Thematic reporting and a governance process for this data needs to be established. There is potential for this data to identify system issues for improvement that are otherwise "under the radar".

There is no such system in place to support feedback to primary care from the hospital sector on care issues. The same cultural and process barriers exist within this workflow. Looking to apply the same principles to address this could only be beneficial to patient care and should be explored.

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A SMART APPROACH TO NEONATAL INFORMATION FOR PARENTS.

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INNOVATION

We developed an app called "Babble – babytalk from MidCentral DHB". The app contains all information parents need to know when they have a baby in the Neonatal Unit (NNU) or Special Care Baby Unit (SCBU), including both local unit information and more general national health information. Parents are able to write a journal entry and capture photos to record key milestones, such as when their baby's feeding tube is removed, which they can share with their friends and family via email and social media. The app also features families who have shared their stories of being in the NNU/SCBU.

CONTEXT

Traditionally parents of newborn babies who are admitted to an NNU or SCBU get a lot of information during the admission of their baby, provided by healthcare professionals both verbally and via pamphlets. This important information in the early days after giving birth and becoming a parent does not always endure. However, it is known that having parents well informed reduces parental anxiety and improves bonding.

SOLUTION

We developed a mobile app for parents that has all the needed information available in a single place, accessible from a personal device and provided by a reliable source. The app gives parents the opportunity to access the information any time of the day and at any place. It enables them to reread the information offline and share and discuss the information with their whanau/extended family. The app also aligns with the NZ Health Strategy to make New Zealanders "health smart" and support them to navigate the health system.

IMPLEMENTATION

Semi structured interviews were conducted with seven sets of parents to get consumer feedback around what the app should contain. A lot of internal brainstorming took place before the project was pitched to management for funding. A project group was then formed consisting of: NNU staff, parents, a software developer, designer, photographer and project manager. Babble was developed, reviewed and tested over four months. Babble was then released in May 2016 and is available for free on the App Store and Google Play store. At present, all parents in the NNU receive information about Babble during their baby's admission. Information about Babble has also been sent to midwives, delivery suite, obstetric clinic and antenatal clinic at MidCentral Health

OUTCOMES

So far all parents who have used the app have been enthusiastic and provided good feedback.

The key factors for success were:

- Commitment and enthusiasm from staff to develop an app that is directly applicable to their practice.
- Support from management to supply funding and resources including lieu days for staff to recognize their time and effort.
- Key skills across the project team including clinical knowledge, software development, and design and project management.
- Parent involvement for design and content and sharing their stories.
- Lessons learnt during the process:
- Prioritising features included in the first release was required (a lot of the initial feedback from parents was specific to individual circumstances).
- Enlisting an external designer and photographer was worthwhile to get the right look and feel for the app.

A formal evaluation of the implementation of the app will be done in the near future.

NEXT STEPS

Although the app has been developed primarily for the NNU at MidCentral Health, the app can be used by other NNU's or SCBU's around New Zealand as well, since a lot of the information included is general in nature. The next step is to engage with other NNU's to see if they are interested in developing their own local section of the app that may include an overview of staff, facilities, expressing room(s) etc. Incorporating the app into business as usual processes is also required to ensure the content is kept relevant and the architecture is updated for new operating systems when required. The ideal is that Babble is the key source of reliable, relevant information for parents of

babies admitted in an NNU in New Zealand.

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EVIDENCED BASED CLINICAL DECISION SUPPORT FOR E-PRESCRIBING AND ADMINISTRATION TO REDUCE ALERT FATIGUE

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INNOVATION

Development of clinical decision support (CDS) for the prescribing and administration of medicines in MedChart® targeting patient outcomes and minimising alert fatigue.

CONTEXT

There is a large gap between the postulated and demonstrated benefits of CDS in eHealth. This is exemplified by electronic prescribing and administration (ePA) systems, largely because of alert fatigue. Alert fatigue occurs when a user receives multiple alerts not relevant to their task. The consequence of alert fatigue is users ignoring alerts and consequent errors (lapses). Another source of error is when irrelevant alerts cause users to change actions inappropriately (rule based errors).

CDS in health care traditionally aims for sensitivity, i.e. to provide all potentially relevant information to the user. This leads to alert fatigue. Despite recognition of alert fatigue, medico-legal concerns lead to health IT vendors persisting with high sensitivity, low specificity systems.

MedChart® (Computer Sciences Corporation, Sydney, Australia) is the ePA system mandated for New Zealand public hospitals. MedChart is supplied with a system defined CDS alerts but also supports locally configured CDS alerts.

The aim of this project was to develop CDS for MedChart® at Canterbury District Health Board (CDHB) minimising alert fatigue and maximising patient benefit.

SOLUTION

The CDHB CDS project developed and implemented a set of locally defined CDS alerts. The primary goal of the alerts is to reduce errors strongly associated with patient harm from inappropriate medicines use. This is in contrast with most other CDS systems where the primary goal is to reduce errors per se.

Our mission is: the right information, in the right place, at the right time.

IMPLEMENTATION

The system based alerts (with the exception of adverse drug reaction alerting) were switched off and replaced with a minimal set of locally defined alerts. Local data on adverse drug events and published literature were used to identify high risk events to target.

The CDS alerts are in several groups including: Dose range alerts – aimed at minimising 10 fold errors in dosing due to decimal point and unit errors. Drug-drug interaction alerts – aimed at reducing the drug interactions known to be strongly associated with patient harm. Formulary rules to facilitate adherence to PHARMAC's hospital medicines list.

Non-alerting CDS is used to reduce errors. For example, Protocols are pre-defined orders sets linked to clinical pathways and Quicklists provide preformatted prescriptions for individual drugs.

External references were used to benchmark our CDS system including validated test scenarios and evidence based audit tools (SAFER Guides <https://www.healthit.gov/safer/safer-guides>)

OUTCOMES

There is high user acceptability of the ePA system. The rate of alerts is low and the rates of adverse events has not increased. External benchmarking using an evidenced based audit tool was valuable for testing design principles and guiding direction of development. There continue to be multiple requests for more alerts based on perceived risk and for reasons other than patient outcomes.

High specificity alerts can be developed, but this is resource intensive and requires a well-designed rules engine and clinical expertise. Despite many years of worldwide experience CDS in ePA software is primitive and there are many lessons to be learned from other industries.

NEXT STEPS

We have set up data extraction to monitor user and system behaviour. We will evaluate alerts (and non-alerts), associated user behaviour, and clinical context using MedChart® data to refine existing alerts and add new alerts.

We are requesting enhancements of the rules engine to facilitate more specific alerts e.g. to include drug dose in drug-drug interaction alerts parameters. We are still in the early stages of development and it will take several years to realise the potential of CDS in ePA systems.

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13,500 TO 7: THE POWER OF NATURAL LANGUAGE PROCESSING IN HEALTH

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INNOVATION

Our District Health Board's strategic partnership with an international technology provider allows us access to innovations and software from their Paolo Alto Lab. We applied their Natural Language Processing software directly to healthcare data for the first time. It allowed us to analyse unstructured data from Radiology and draw meaningful conclusions, which allowed us to solve a clinical problem a lot more rapidly than would have otherwise been possible.

CONTEXT

A small IT infrastructure issue had resulted in an intermittent, hard to spot issue where some hard copies of radiology reports for some clinicians were failing to print and be distributed to clinical teams. The reports were available electronically and were used by many clinicians. Following identification and resolution of the issue there was no way of telling which reports had been accessed and followed, and which (if any) had been missed.

The traditional option was for radiologists to manually read, classify, sort and investigate the 13,500 undistributed reports.

SOLUTION

We had already scoped a trial case study of the software with our Radiology department when this situation was discovered. We changed plans and applied the software to an extract of the affected 13,500 unstructured reports. This allowed us to 'read' the reports virtually instantaneously, classify and form logical and robust conclusions about the radiology investigations in question. From there we were able to work with clinicians to query, isolate and in many cases exclude reports from our investigation.

IMPLEMENTATION

The extract of impacted radiology reports was placed on a server with the software and 'ingested' into the tool. With the software owner and Radiology SMOs the data was queried.

OUTCOMES

This innovation allowed the exploratory team to review 13,500 affected radiology reports, and identify 7 patients that needed contacting. This process was completed in a significantly shorter time than a manual review would have taken.

The pilot allowed us to ascertain the immense value in being able to access and query our previously inaccessible unstructured data sources.

NEXT STEPS

Following the application of this software to the problem, we will be using the software in an extended form to provide access to our unstructured data to solve similar problems. Data is currently being uploaded to allow exploration of other in depth questions, and to solve issues that require unstructured and multiple data sources.

Three use cases are currently being setup with the aim of using the tool operationally with teams as diverse as clinical coding and radiology.

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PILOTING SHARED CARE FOR THE NEW ZEALAND NATIONAL INTESTINAL FAILURE SERVICE

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INNOVATION

The National Intestinal Failure Service's connected care pilot supports patients with intestinal failure to have care delivered in their own DHB. The multi-disciplinary team achieved this by creating patient-centred multidisciplinary intra-DHB teams, working in a virtual environment with patient-specific shared care plans, for patients in Hutt and Hawkes Bay DHBs.

CONTEXT

Patients with intestinal failure are medically fragile and need timely intervention when and wherever they present. Care is often fragmented across the care settings e.g. Starship (tertiary), DHBs (secondary) and GPs (primary) due to poor information systems interoperability. Patients want to be cared for in their own communities with the ability to access specialist care.

To improve patient safety and empower patients to self manage, relevant information must be easily and securely available to the patient, their whanau/family and multi-disciplinary team. Any solution must be age-relevant and enable patients with long term conditions to manage their care across their life span.

SOLUTION

The e-shared care solution was designed to place the patient and whanau at the centre of their healthcare, transforming their experience within the healthcare system in line with Simon Sinek's Golden Circle communication model.

Whanau Tahi Connected Care (WTCC) supports a secure shared care plan, accessible via mobile devices, and integrated within existing hospital systems such as Concerto. This enables the development of a personalised electronic care plan which is comprehensive and supports coordination of care in partnership with the patient. The Shared Care snapshot summary allows clinicians providing acute care to view important and relevant clinical information e.g. allergies, diagnosis, medications, care plans and previous care decisions. Each patient has a care coordinator, in this case either a community nurse or clinical specialist.

IMPLEMENTATION

WTCC is available as a service and does not require additional on-site implementation. Already used throughout Auckland DHB and endorsed as the National Shared Care platform, WTCC can be easily extended to other DHBs as necessary.

By mid-2016, approximately 20 children have shared care plans and 20 adults have been enrolled with shared care plans being developed. One to one training is provided by an ADHB trainer as each patient, family/whanau joins the pilot.

In addition, WTCC's scheduling and task management features are being applied to support some 30 other families.

OUTCOME

The pilot began in late 2015 and is receiving positive interest from other DHBs who are managing patients with intestinal failure, for its potential to remove the barriers to equitable access and integrated healthcare provision through teamwork across healthcare environments.

It is anticipated that the health care experience for the patients and their family/whanau will improve over time as processes are tested, evaluated, refined and embedded in practice. This includes developing strategies to address perceived potential barriers to adopting a shared care such as computer/device literacy and patient and family/whanau discomfort with reliance of technology to access healthcare.

NEXT STEP

The needs of patients with long term health conditions change as they age and electronic shared care plans should adapt as people transition through their lifespan and also across care settings e.g. changing privacy settings as teens mature into adults and rely less on their parents.

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'THE RIGHT INFORMATION, AT THE RIGHT TIME AND IN THE PLACE' – PHYSIO 24/7: A ONE STOP DIGITAL TOOL BOX.

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INNOVATION

Physio 24/7 is an Acute Care Resource: an interactive online information repository, hosted on a browser and available on mobile devices. It was created to;

- I. Establish an up-to-date physiotherapy evidenced-based source of key clinical information and resources.
- II. Provide point-of-care access to crucial clinical information, support professional judgement, aid and confirm clinical decision making and enhance patient/staff safety.
- III. Support a 24 hour seven-day physiotherapy service.
- IV. Align and standardise pathways/procedures/processes of care for patient specific presentations.

CONTEXT

Physiotherapists working in the acute hospital environment commonly undertake weekend work and emergency on-call duties. This includes the assessment of patients with acutely compromised respiratory function, where problem recognition needs to be accurate and interventions timely and effective to prevent further deterioration often using specialised equipment and methods of treatment. Problems are often managed in isolation and in challenging circumstances where decision-making needs to be rapid.

The complexity of all admitted patients continues to increase, requiring greater knowledge in staff. There are many challenges associated with treating respiratory patients outside the normal hours of work; staff may be in an unfamiliar environment or may not regularly work with acutely unwell patients. Comprehensive training is provided for all physiotherapy staff however the irregular frequency with which specialised skills and techniques are indicated means that physiotherapy staff may feel challenged to deliver safe and effective patient care.

Access to up-to-date manuals and clinical resources to confirm decisions is often required but not readily available in the clinical setting; accessing information at point-of-care is crucial. To physically locate hardcopy policies, procedures and guidelines poses a real risk to timely patient care and ensuring best practice. These hardcopy manuals are usually located off the wards in the department and despite systems in place are challenging to review and update easily with evidence based practice (EBP).

SOLUTION

Consultation was undertaken with the Allied Health Clinical Lead for Informatics and other key stakeholders to refine the concept and develop a project plan.

Global physiotherapy software was reviewed and nothing was found to meet the requirements identified. Alignment of physiotherapy resources, processes and pathways with current evidence was undertaken. Information technology support was engaged to undertake the development of a novel online clinical tool – 'Physio 24/7'.

IMPLEMENTATION

Physio 24/7 was launched on 29th June 2016. We presented it in a number of forums across the hospital system including to all of the Allied Health Staff as well as the specific training for physiotherapy staff. It is browser based and accessible via the DHB's Intranet, both on desktop and mobile device.

The project scope also includes a document review cycle to ensure that information remains contemporary, and users can provide feedback via the website to the site developers where the content is externally peer reviewed. Data on use of the Physio 24/7 site is available for monitoring and evaluation, providing critical insight into the evolution and development of the site's functionality.

OUTCOMES

The way Physio 24/7 tool mobilises EBP has potential for application to physiotherapy services across New Zealand. We realised that not all innovations are best suited to a mobile application and that indeed a browser based resource is far more apt in some situations. Being able to provide standardised information to aid in clinical decision making, enhances patient and staff safety – an essential quality assurance

and benchmark. The need for clear discussion between the technical staff and clinical staff is essential and became apparent working closely together with the Clinical Lead for Informatics, Streamliners and Physiotherapy staff. The translation of terminology, reasoning for functionality and understanding the technical limitations were all key parts of the process.

NEXT STEPS

Expansion on information available on the site, development of multimodal information i.e. videos, inclusion of fellow Allied Health professions and planning how to develop the site structure for sub-acute areas of service and other national centres.

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PRIMARY CARE PATIENT EXPERIENCE: DEVELOPING AND IMPLEMENTING A NATIONAL SURVEY

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INNOVATION

The development and implementation of a longitudinal national primary care patient experience survey to provide an actionable, 'universe view' (i.e. across every general practice in New Zealand) of patient experiences, focusing on key factors such as access to care, the integration of care through general practice and the experiences of people with long-term conditions.

CONTEXT

Patient centeredness or patient experience of care is a dimension of nearly all definitions of health services quality. A systematic review of 55 studies concluded that patient experience is positively associated with patient safety and clinical effectiveness. Capturing patient experience is therefore an integral component of health service quality. We sought to develop and implement a national survey in primary care that measures experience not satisfaction; is valid, well tested, and gives useful actionable information; covers the experience of the whole health system; minimises administration costs to PHOs and practices.

SOLUTION

In this project, we opted to make the survey available primarily via email or an sms link, with a further option of in situ surveying using tablets to ensure all population groups are well-represented in results. Results were presented on a national dashboard. Attention was given to understanding the patient insight needs of different sector stakeholders so that one programme efficiently meets the needs of different groups such as GPs, PHOs and DHBs.

IMPLEMENTATION

The survey underwent extensive cognitive testing and piloting in five PHOs with sixteen practices. Roll-out of the survey was phased, by May 2016, 70 practices in 6 PHOs were participating.

Survey results were made available to a wide range of users across the sector via a unique log-in, and are presented on a live dashboard that updates results in near real time, configuring reporting to user roles so that reporting is relevant. Depending on their level of approved access, users can benchmark their practice with other practices in their PHO, or by PHO or DHB. In addition to questions, patients are able to provide free text comment on their experience. The comments are particularly useful for outlining why certain ratings have been given and what could be changed to improve patient experiences going forward.

OUTCOMES

The following questions will be discussed:

While online access reduced the administrative burden of paper surveys, did opting to go paper-free adversely affect response rates?

Were the responses obtained using in situ surveying different to those received online?

Were those responding demographically different to those who attend primary care?

How do we anticipate results being used for service improvement across each level of the sector?

NEXT STEPS

National implementation of the primary care patient experience survey continues.

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SMARTPAGE ORDERLIES - A NEW WEB AND SMARTPHONE BASED ELECTRONIC ORDERING, MOBILE DISPATCH AND ORDERLY MANAGEMENT SYSTEM DEVELOPED WITH CAPITAL AND COAST DHB

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1. Oncall Health, New Zealand
2. Capital and Coast DHB, New Zealand

INNOVATION

Oncall Health and Capital and Coast DHB have developed and deployed the first smartphone based orderly management and dispatch system used in New Zealand. Smartpage Orderlies, now being used in Wellington and Kenepuru hospitals, is a new approach to orderly task management, with ward based electronic ordering, real-time semi-automated dispatch and two-way communication, and smartphone based task queuing, location, and progress reporting for mobile orderlies.

CONTEXT

Previously at Capital and Coast all ward-based tasks were created by fax or by phone call to a central dispatch office, where dispatchers manually logged all tasks into a legacy task management system. Dispatchers communicated these to roaming orderlies via radio calls and alphanumeric pages, then received radio calls back and manually updated records when tasks were completed.

This involved a large amount of time spent in communication and manual data entry, provided very little oversight and transparency into orderly movements for dispatchers, and created the opportunity for frequent delays and inefficiencies in patient flow.

As an example, radiology and clinic transfers were often double-booked with incorrect information, leading to delayed appointments and significant flow-on effects to high-cost departments. These were booked in advance via fax and manually entered. Details were often out of date, however as wards had no access to current bookings or transit details, there were often significant transfer delays when orderlies arrived unexpected or with incorrect equipment.

Due to the simple nature of the system, there was also no way to accurately report on task transit times, staff utilisation, or transport delays, which meant that common issues couldn't be accurately quantified or analysed for service improvement.

Other DHBs in New Zealand face similar issues, with orderly departments that rely on voice or fax orders. Some DHBs do use electronic ordering systems, such as Waitemata and Counties Manukau DHB, however these do not provide mobile dispatch, real-time updates, or detailed task reporting.

With a legacy system that needed replacement, Capital and Coast required a new system that could provide ward based electronic ordering, a more streamlined and partially automated dispatch system, and accurate and detailed task reporting. The system would have to support over 55,000 tasks a month, with 30 orderlies using mobile devices across multiple hospital sites, with a highly reliable 24x7 operation.

SOLUTION & IMPLEMENTATION

Smartpage Orderlies is based on the same technology as Smartpage Clinical, a smartphone system designed for critical hospital messaging. Based on that technology, the e-ordering, dispatching and mobile orderly system was developed with Capital and Coast to provide a new and efficient workflow tool for orderly tasks.

The ward e-ordering tool is intranet based, and allows nurses to order common orderly tasks with a simple interface, designed to integrate with local PAS systems. Most information auto-populates, including location, bed, and patient demographics. Once a task is created, that task and its progress is then visible in real-time to the ward, their destination, to transit care and dispatch, and can be updated.

As well as traditional dispatch, the system introduces the idea of self-dispatch and automated dispatch. Emergency Department tasks are created and automatically dispatched to the next available ED orderly, with no dispatcher at all. On night shifts, orderlies can self-dispatch tasks on their mobile as they are created, removing the need for a dedicated dispatcher and allowing orderlies to assign tasks remotely in real-time.

On their smartphone device, orderlies receive all task details, activate and update them as they progress, and log delays or interruptions, all of which update all relevant hospital locations in real-time.

The dispatch interface is also intranet based, and is designed to reduce dispatcher workload significantly. It gives a single dispatcher a global view of all orderlies and pending tasks, including their current workload, exact hospital location, task progress, and whether or not

they are on break. The dispatcher can shuffle tasks around in real-time, including queuing up multiple tasks for individual orderlies, so they have a constant task list of jobs at all times.

Additionally, 'diary tasks' or scheduled tasks can be created, allowing the automatic creation and allocation of repeat daily tasks, for example, a Security orderly's daily routine.

OUTCOMES

This presentation will look at the new technology involved with Smartpage Orderlies, the new workflows, visibility and efficiency gains achieved with a rapid smartphone based dispatch system, and the experience at Wellington and Kenepuru hospitals over the first three months of implementation at Capital and Coast DHB.

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PROACTIVE MEDICINES MANAGEMENT SUPPORTS MORE PATIENT-CENTRIC SERVICES

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INNOVATION

During 2015, a pilot of a Medication Adherence Support Service module on Whānau Tahi's Connected Care platform enabled Waimauku Village Pharmacy to offer proactive medicines management, resulting in efficiencies and benefits for itself and its community.

CONTEXT

People with one or more chronic health conditions often need multiple medications taken at different times, and this can lead to the patient having difficulty managing all their medications, and sometimes not taking it at all.

A new contract between the Ministry of Health, DHBs and pharmacies in 2012 signalled a shift to more patient-centric services. This model introduced a new Long Term Conditions fee for the support and targeted care that pharmacies provide for high-needs patients.

The new model better recognises pharmacy staff's expertise and their contribution in primary care, but pharmacies required tools to support their patient-focused approach.

SOLUTION

A new module for facilitating patient medication adherence was developed within Whānau Tahi Connected Care (WTCC), called Medication Adherence Support Service or MASS.

MASS enables community pharmacists to help patients proactively meet their personal goals and manage their medicines, while also saving money on medications. It allows a pharmacist to assess a patient's medications adherence status. Based on the assessment, pharmacist and patient agree a Medications Adherence Plan to address any issues. The pharmacist can also maintain a Managed List of Medications for a patient.

This Medications Adherence Plan and Managed List of Medications is part of a patient's overall Shared Care Plan and can be seen and updated by other members of the care team, and by any other authorised clinician including ED and out of hours care.

The pharmacist can securely interact with the patient and their Care Team members to co-ordinate the response to improving meds adherence.

IMPLEMENTATION

Whānau Tahi involved 20 pharmacies in developing MASS, recognising that the community pharmacist is an integral member of the care team.

The module was designed to be as painless for pharmacies as possible, overcoming many common barriers to adoption including "launch in context" integration with Pharmacy Management systems LOTS and Toniq. The MASS module is delivered 'as a service' and can be accessed from existing PCs and requires no additional IT support within a pharmacy. In the Northern Region, it is part of the regional "e-Shared Care" solution so all users of e-Shared Care and other regional systems (e.g. Concerto) can access the Plan and List without any additional integration.

At Waimauku Village Pharmacy, for example, pharmacist Robbie Hanon redesigned his whole pharmacy model of care for LTC patients, based on WTCC, resulting in a 50% increase in patients seen (and eligibility for LTC subsidies) with no additional staff costs.

OUTCOME

Previously pharmacists had no visibility of patients' care plan so were unable to contribute meaningfully. Enhanced collaboration with the patient's multidisciplinary care team is now supported, in part through pharmacies using recognisable clinical presentations and the improved display of information.

MASS is aiding the transition of pharmacy services from patient-initiated medicine supply to more proactive, patient-centred pharmacy care. Proactive medicines management helps to reduce errors and harm, while leading to direct cost savings for the patient in medication management. It also enables pharmacists to maximise the value of the LTC component of the Community Pharmacy Services Agreement.

Feedback from participating pharmacies (with several thousand LTC patients) in Northern region showed that WTCC MASS supports

business processes, freeing staff to spend more time with patients and understand their needs.

Various DHBs are now exploring how to use WTCC MASS to support LTC-eligible patients.

NEXT STEP

MASS enables Community Pharmacists to be part of an integrated system of health care provision, with patients as the focus. Future gains may also be made through improved reporting, which could provide evidence of service provision and reduce the audit burden on pharmacies.

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A TALE OF TWO CITIES. A DESCRIPTION OF NZDHB COLLABORATION IN THE INSTALLMENT AND ROLLOUT OF AN INNOVATIVE CLINICAL IT SOLUTION.

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INNOVATION

The configuration of Patienttrack[®], a digital & mobile solution for patient assessment, in two District Health Boards (DHB). With the product development understanding the similarities and differences in healthcare needs and provision while recognising the importance of flexibility and adaptability to the end user.

CONTEXT

Internationally the "early" recognition of the deteriorating patient is a concern for healthcare. The primary tool for identifying deterioration is the measurement of vital signs and the Early warning score (EWS). Paper based systems allow the failure to record vital signs and only represent data in one place at one time. This lack of documentation and visibility results in missed referral and untimely patient assessment. That then contributes to negative outcomes for the individual and for organisation.

SOLUTION

After independent reviews both DHBs chose Patienttrack as solution to improve the process performance of vital sign observations management system. Its open architecture allows for easy integration with current systems. Its agnostic device platform does not drive a DHB towards any single device. Data is entered once and can be used multiple times in multiple systems. Information is now used in the immediate patient at risk context, enables team planning for day to day work stream planning and will be used for advancing capacity and resource management on a hospital level.

Each DHB has subtle differences in their current tools and drivers for health. So the system was developed by separate project teams. In both DHBs this is the first time that RNs at the bedside are entering and viewing information on a tablet rather than using paper. This information that is traditionally kept at the end of the patient's bed is now able to be viewed remotely by clinicians as part of the digital health record.

IMPLEMENTATION

Both projects are clinically led to ensure the end user has been represented. With support from IT to ensure integration with current system architecture and infrastructure. The development of the user interface and base system was undertaken with clinical subject matter experts. This system was then trialled and evaluated in a single clinical area prior to rolling out to other areas. All clinicians were invited to give feedback on all areas of the trial, from the system to the education components.

This evaluation allowed the project team to develop a comprehensive rollout model. This model is a 3 phase process run by a clinical implementation team with a clinical area champion.

- Week 1: Clinical engagement, IT infrastructure install, education
- Week 2: Dual process, paper being main record, mentoring, trouble shooting and reinforcement of training
- Week 3: Paper free, trouble shooting and development of self-efficacy.

This process is running concurrently through clinical areas. Clinical staff from 18yrs old to 75yrs old have been able to learn and use the system effectively with this approach.

By working collaboratively clinical assessments have been created that can be used by either DHB. Local variations may be still required. But the magic of using standardised terms and labelling of data is that the information becomes vendor neutral and is useable to compare and improve clinical practice across DHBs. Both DHBs share a common portal provider, this commonality of vendor platform allows replication of integration with other clinical systems.

OUTCOMES

Outcomes from the use patienttrack in the UK have shown proven benefits in

- Reduction of length of stay
- Reduction in mortality
- Improvement in accuracy of EWS calculations

- Increased level of clinical attendance
- Reduction in number of ICU days.

Both projects have shown immediate benefits

- Vital sign completion rate from a base of 60-70% rate to 100%
- Accuracy of the EWS numeric is now automatic so this is now always 100% accurate.
- Time saving of looking for charts which has been observed as up to 10% of an RNs shift time has been eliminated.
- Vital sign and nursing assessment part of the digital record
- Peripatetic clinicians are viewing the data remotely to assist decision making and work planning.

Expected outcomes regarding quality and appropriateness of care for the deteriorating patient will require a longer timeframe to see an effect.

User have found the system very simple to use and the early wards have now embedded this in their practice with the first group of new graduate nurse not knowing a time when paper observations charts have been used.

Lessons learnt have included the need to involve all clinicians of all levels to feedback and have involvement in the user experience. All clinicians use information differently and this has to be represented in the work streams.

The implementation highlighted the difference between work as imagined and work as done. Showing the need to examine our policies and procedures to ensure that they reflect actual practice as well as best practice.

NEXT STEPS

Completion of the roll out and "Turning on" the automatic notification function will enable the projects to complete the benefits realisation regarding timeliness of assessment and appropriateness of goals of care.

CDHB is developing a data dashboard to enable meaningful and targeted quality control and improvement cycles on a team, ward and DHB level.

Patientrack also provides a platform for developing forms to tackle the burden of nursing documentation. The development of a nursing assessment and care planning system within this platform has already started. This will enable real-time monitoring of patient data such as falls nutrition and pressure area risk and delirium, dementia and mobility status.

Integrating with regional systems to allow the data to follow the person rather than remain with the hospital admission.

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SMART RETINAL SCREENING SYSTEM: BUILDING IT FROM A CREDIT CARD SIZE COMPUTER

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INNOVATION

This project involves the creation of a low cost yet high-tech fundus camera for retinal screening. The innovation uses a low cost single-board computer known as Raspberry Pi 3 as the processor and platform for a fundus camera. It is capable of wide-field retinal image acquisition, smart retinal analysis and wireless transmission.

CONTEXT

Eye care in rural and primary care setting in New Zealand is sub-optimal. With the growing demand of ageing population, the conventional centralised health care system is struggling to cope with the standard model of care. Eye diseases such as diabetic retinopathy (DR) and age related macular degeneration (ARMD) require regular screening and monitoring. The lack of access to conventional imaging device such as fundus camera and optical coherence tomography (OCT) in the community leads to exhaustion of resources in tertiary centres by retinal screening. In standard practice, the retinal photos are reviewed by a trained optometrist or ophthalmologist and patients receive a report a few weeks or months later about the outcome of the screening. An appointment will be made if the patient requires further clinical assessment. This inefficient system leads to multiple patient visits, unnecessary ophthalmological review and adds to the workload of an already overwhelmed ophthalmology department. In summary, there are three major problems; 1) high equipment cost hence low accessibility in the community, 2) the need for trained professional to review all images leading to potential inter-rater reliability error, 3) the current system is inefficient and leads to multiple patient visits, increased cost and decreased clinical compliances.

SOLUTION

The solution is the development of a smart low cost fundus camera using a single-board computer with artificial intelligence (AI) and wireless transmission capability. Deep-neural-networks are employed to train the AI installed in the fundus camera. It can be trained to screen various ophthalmic diseases such as ARMD, DR, and hydroxychloroquine retinal toxicity. Retinal images acquired can be instantly analysed by AI to detect normal versus abnormal retinal images and whether a further clinical review is needed. If the retinal images were deemed abnormal, the AI will issue an alert and an ophthalmology appointment can be arranged instantly. Conventional fundus camera cost more than NZ\$ 25,000 per unit; our system cost less than \$ 1,000 per unit.

IMPLEMENTATION

We have started a pilot trial in Dunedin Hospital, Southern District Health Board (DHB), New Zealand. The aim of the study is to ensure that the system has a high sensitivity (greater than 95%) for detecting ARMD. We believe specificity is not a high priority at this stage as patients will still require review by an ophthalmologist for clinical diagnosis and treatment.

OUTCOMES

We are currently in clinical validation stage and have screened 10 patients with ARMD. The system successfully detected 10 out of 10 cases, delivering a very promising early outcome. We learnt that creating an entirely new system comes with its own challenges; the main challenge we have yet to overcome includes regulatory approval and certification. Further funding is required to proceed to the next stage.

NEXT STEPS

The next step is to 1) improve the AI's specificity and sensitivity for DR and 2) to design a larger clinical study to validate it. We also intend to launch a national challenge in conjunction with the blind foundation to further improve the design and function of the system. When consistent, reproducible results are achieved in the larger studies, we intend to work with other DHBs to replicate the screening system in the community setting.

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SPGETTI: A SMART-PHONE BASED PROBLEM GAMBLING EVALUATION AND TECHNOLOGY TESTING INITIATIVE

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INNOVATION

A 'smart' theoretically-based, personalised intervention that interacts with the environment through geo-location and uses timely notifications to prevent relapse to Electronic Gambling Machine (EGM) based problem gambling. Designed as a complementary tool alongside current support services

CONTEXT

Problem gambling, whatever the medium, is associated with widespread negative socioeconomic, social and health effects in New Zealand, and the negative impacts on individuals, families and communities have been well documented. In particular, problem gambling has been associated with financial hardship, bankruptcy, crime and incarceration, anxiety and depression, suicidality, substance use/abuse, disruption to employment/study, breakdown of family units, child neglect, and disruption to the family and community of which the problem gambler is a member.

In the field of addiction, prevention at a population level is the idea, but seldom fully attainable when a product or service has become established and normalised in society. As regards treatment, the chief therapeutic goal is complete abstinence. However, maintaining abstinence is difficult, in part due to exposure to cues that trigger relapse. Abnormal cue reactivity is a central feature of all addictions, including problem gambling, and is associated with increased activity in motivation to engage in the behaviour. In people with problem gambling, direct presentation of gambling cues has been found to trigger gambling activity in around half. While the advent of the personal smartphone has created new opportunities for gambling harm via online gambling, it has also created opportunities to intervene at various stages in the problem gambling continuum, from prevention to relapse prevention. Our approach harnesses widely available and affordable smartphone technology used in everyday social and commercial transactions as a vehicle for 'smart' theoretically-based, targeted personalised interventions that interact in a contemporaneous way with the environment, to change potentially harmful gambling behaviour.

SOLUTION

We have developed a smart phone intervention app with a number of features from geo positioning tracking, EGM geo-fencing (figure 1), gambling prevention notifications, tips and strategies, call a support person for help, daily strategies and wellness notifications, and a My Week dashboard (figure 2).

Figure 1: EGM Geo-Fencing



Figure 2: My Week



IMPLEMENTATION

We used a co-design approach across all aspects of the design: the content of the routine messages and just-in-time messages when in an EGM zone, the other app functions (my week, top tips) and the look and feel of the app overall. Co-design is an essential step in this type of research to ensure that the usefulness, acceptability and utility elements reflect the end users' needs and ways of working.

Now the app is built and in partnership with problem gambling services, a small randomised control trial will be undertaken to test the efficacy and effectiveness of the app in supporting the prevention of EGM problem gambling relapses.

OUTCOMES

The trial intervention will not be complete until early 2017 with final analyses expected to be complete March / April 2017. However, to date we have gained significant knowledge in understanding geo-positioning technology and associated tools and plug-ins to maximise positioning accuracy, minimise battery drain and reduce risk of false positive and negative triggers with regard to participants entering EGM zones.

With regard to the development of content and timing, we have gained insights from the problem gambling community combined with our experience using personalised theory based messaging in other addiction solutions.

NEXT STEPS

To complete the study and evaluate the effectiveness of the app in supporting problem gambling relapses. Although findings are not yet available, consumer interest and feedback to date has highlighted the need for the app to be available in other languages and shaped to accommodate other cultural patterns and views of gambling.

ACKNOWLEDGEMENTS

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SCRIPT: A MOBILE APP TO SUPPORT ADHERENCE TO ANTIBIOTIC PRESCRIBING GUIDELINES

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INNOVATION

A mobile app, that provides accurate and timely knowledge of antibiotic guidelines designed to be easily consumable and which incorporates work flow and the environment of doctors and other prescribers.

CONTEXT

Antibiotic resistance is one of the great global scourges of modern medicine and public health. A key contribution to resistance is poor adherence by clinicians to evidence-based antibiotic guidelines. This may often result in over prescribing antibiotics, particularly of very broad spectrum antibiotics. Active antimicrobial stewardship programmes, electronic medicine prescribing tools, and web-based guidelines have contributed to improvements in prescribing; however, there remains great potential for improvement. A smartphone application ('app') provides the ability to have information readily accessible, understandable, and directly actionable at the time medicines are being prescribed, and opens a new era of possibilities in improving patient care, reducing errors, and improving health care efficiency without compromising quality. However, research into the impact of antibiotic information provided via a smartphone app is sparse and the sole peer reviewed study found in field examined at uptake and usage, but did not study the impact on the patient population.

SOLUTION

A smartphone application called SCRIPT, that provides the ability to have antibiotic guidelines and related information readily accessible, understandable, and directly actionable at the time medicines are being considered, discussed and subsequently prescribed. No guessing.

IMPLEMENTATION

We took a co-design approach to develop the content (based on the web antibiotic guidelines), and with help from DHW designers, shaped the look and feel so as to make the use easy and intuitive. Co-design is an essential step in our research to ensure that the usefulness, acceptability and utility elements reflect the end users' needs and ways of working.

OUTCOMES

Measuring the impact of the innovation is not yet complete. However, to date, the interaction and engagement with clinicians has highlighted that an app in your pocket is a "great idea". Feedback from the early users of the app have elicited positive responses such as "this is great" and "I can see me using this a lot" responses. Early uptake signs are also good with (at mid-July) 139 ADHB doctors and pharmacists having downloaded the app and are using it. These users represent all roles (house officer to consultant and Pharmacist) and are distributed across disciplines from Emergency Medicine, General Medicine, and Medical Specialities.

NEXT STEPS

To finish the intervention period (June – August), and analyse the impact of the app on practice. In other words, compare the prescribing adherence to antibiotic guidelines between the "no app" periods with the "app" period and compare it with two DHBs who don't have the app at all. If the app is successful, we believe it could be used by any DHB in NZ as it has been developed 100% in the NZ context.

Furthermore, there are a range of added value additions that are being considered. Our ideas so far include, linking the app to NZ Universal List of Medicines (NZULM) for key information regarding contraindications or for more information on specific drugs. In light of the advancement of the electronic prescribing (eRx) programme or work, the ability to create codes for specific guidelines in the app that match the same guideline code in eRx could mean that a Doctor or Pharmacist can enter that code in the system and the chart auto populates with the appropriate medicine(s) – to check and agree. This will both save time and improving adherence with minimal effort.

ACKNOWLEDGEMENTS

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TAPUAKI: PACIFIC PREGNANCY AND PARENTING PROGRAMME

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INNOVATION

The Tapuaki programme comprises a number of key features which sets it apart from prevailing antenatal education programmes. It is primarily designed for Pacific women, their partners and families. Strategies include:

- Community-based pregnancy education and support services (which includes evidence-based and culturally relevant content and materials)
- Partnerships with existing primary health care providers and other pregnancy support services
- Web-based education and support e.g. website, social media sites
- Phone-based education and support e.g. smart-phone application

CONTEXT

Improving health outcomes for Pacific mothers and babies is the motivation behind the Tapuaki Pacific pregnancy and parenting programme. The purpose is also to assist with better engagement of Pacific pregnant women, fathers, their families and care providers and to improve access to and delivery of pregnancy and parenting education.

A recent report from the Perinatal and Maternal Mortality Review Committee (PMMRC) found that Pacific women (including those who smoke during pregnancy, women living in poorer areas and women having their first babies) are at increased risk of neonatal death of babies born between 20-27 weeks (a baby born alive between 20 to 27 weeks gestation who dies prior to 28 days of life); are three times more likely to die while pregnant or up to six weeks after birth than non-Maori, non-Pacific mothers; and have a higher incidence of neonatal encephalopathy, a condition usually resulting from lack of oxygen to the brain around the time of birth. Furthermore, Pacific women have the highest fertility and birth rates in New Zealand but represent a low uptake of antenatal education despite it being integral to successful pregnancy and birthing experiences. The limited research indicates that less than one per cent of participants attending childbirth education in 2009 were of Pacific ethnicity. The reasons for Pacific peoples' low engagement in antenatal education are not known as little research has been conducted in this area. What's known is most antenatal education courses in New Zealand are delivered by non-Pacific peoples, with variable knowledge and understanding of Pacific cultural beliefs which may help to explain this.

By participating in the Tapuaki programme, it is hoped that Pacific pregnant women of all ages, and their families are empowered to talk about pregnancy and parenting, ask questions, seek advice, and make more informed choices about pregnancy and infant care.

SOLUTION

The Tapuaki programme comprises a number of key features which sets it apart from prevailing antenatal education programmes. It is primarily designed for Pacific women, their partners and families and consists of:

- Community-based pregnancy education and support services (which includes evidence-based and culturally relevant content and materials)
- Partnerships with existing primary health care providers and other pregnancy support services
- Web-based education and support e.g. website, social media sites
- Phone-based education and support e.g. smart-phone application

IMPLEMENTATION

Three pilots of the Tapuaki Pacific pregnancy and parenting education classes were delivered in Auckland in partnership with Pacific providers during November and December 2013. The first smartphone app for Pacific mothers and a website (which can be translated into eight Pacific languages) were rolled out in May 2014. Both success factors and challenges during both the development process and piloting of this programme will be shared.

OUTCOMES

There is little doubt that the piloted Tapuaki pregnancy and parenting programme has been successful in increasing pregnant Pacific women's knowledge and confidence about pregnancy and parenting. The Tapuaki pregnancy and parenting programme is not a stand-alone tool, but one intervention which can assist with better engagement of Pacific pregnant women, fathers, their families and care providers.

NEXT STEPS

The Tapuaki Pacific pregnancy and parenting education programme is the only known programme of its kind for Pacific peoples in New Zealand. It has the potential to improve Pacific women's access to, and use of, maternity services and antenatal education. Through the use of evidence-based and culturally relevant content and materials, Pacific engagement, health literacy, empowerment and participation in antenatal and maternity care can be achieved.

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STRUCTURED AND PRIORITISED – ADDRESSING THAT “OVERWHELMING” FEELING IN DATA QUALITY AND MASTER DATA MANAGEMENT

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INNOVATION

A strategic master data and data quality improvement programme was developed and implemented in a DHB.

CONTEXT

The DHB executive team wanted to make the best decisions possible, based on data of sufficient quality. Those entering the data at the frontline didn't understand the importance of the data they were collecting and the follow on impact of incomplete and inaccurate records. Those working with data sets had no ability to make the organisation wide changes necessary to improve the data.

SOLUTION

The programme began with a data quality strategy to ensure all business units were aligned in their approach to data management and use. Governance was agreed with the executive team having final approval of all projects within the programme. A process for identifying what the organisation considers essential master data helped prioritisation.

A data quality team made up of midlevel managers across the organisation formed the working group. The purpose of the Data Quality Steering Group initially was to provide appropriate direction to the Data Quality Management Framework Project. The ongoing purpose of the group is to improve the robustness of decisions made by DHB decision makers and improve the data extract process to the Ministry by improving the quality of data collected.

The data quality framework was used to provide structure to the programme and to inform strategy development. The framework allows for benchmarking of data quality levels pre and post improvement initiatives.

Through education and the systematic change in processes DHB staff learnt how to operationalize the ongoing management of data to an agreed level of quality. Processes now support the business to develop clear requirements for their master data, ensured data collectors are clear on requirements to supply data of sufficient quality, and the data tracked using process mapping. Components of a metadata repository were agreed.

IMPLEMENTATION

The team worked through the data quality assessment framework and agreed local language and dimensions to be included, whilst assessing a real dataset. Improvements documented were grouped into people, process, and technology, with action owners for each area. Education sessions were provided to groups throughout the DHB, focusing initially on data collectors.

Improvement initiatives included the development of regular operational processes that prevent poor data entering systems, alongside targeted data cleansing. The purchase of data quality management software was assessed when the quality issues were better understood. The framework was used to reassess data quality levels post improvement projects. This process used a total data quality management cycle for iterative improvement.

OUTCOMES

Data quality is often seen as 'overwhelming'. The strict prioritisation of improvements is through the identification of master data. An assessment of quality, using a structured framework, shows prioritisation requirements within the master data set and highlights consistent data quality issues across six dimensions.

Data Quality improvement requires that all areas of the organisation are educated on the strategy and buy into the new processes.

The programme used innovative methods to prevent the introduction of data quality errors and viewed data quality management holistically. The programme provided a structured and prioritised process for targeting the best return on investment. A significant improvement on the maturity level of data quality management in the organisation was essential and achieved through focussing on the importance of data as an asset.

NEXT STEPS

The DHB will continue to manage their own data quality using improved processes. This allows for iterative improvements to the quality of

the data through repeated quality cycles.

This process can now be used in other organisations, inside and outside of health.

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THE VIRTUAL DISTRICT HEALTH BOARD, VIRTUALISING HEALTH CARE IN THE NEW ZEALAND ENVIRONMENT

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INNOVATION

The Waikato DHB have embarked on a 2-year project with application software developer HealthTap in order to increase access to health care in the Waikato region. The application enables video consultation, text based questions and answers, health resources and the ability for patients to hold their own consultation records, checklists and tasks.

CONTEXT

Waikato DHB is the largest rural District Health Board in New Zealand, approximately 60% of our population live outside of the main city of Hamilton. Waikato DHB provides tertiary level services to almost 40,000 people within its area and also supports the surrounding DHBs of Bay of Plenty, Tairāwhiti, Lakes and Taranaki. We have pockets of very low income groups who have difficulty accessing appropriate health care. There are 4 small rural hospitals within the DHB providing variable services with the largest providing surgical and medical inpatient services and the smallest providing GP and NP led emergency and inpatient services. Providing health care for people living in rural areas comes with many challenges; it takes longer and costs more for patients and staff to travel to and from health services, access to primary health care and emergency care is often difficult, particularly after hours, it is hard to attract and retain health professionals and health services can often be fragmented between primary and secondary care. The DHB were looking for a whole of service change to future proof the healthcare service within the context of rurality.

SOLUTION

The Waikato DHB have worked to develop an application: "The Virtual DHB powered by HealthTap". This application can be used in any web browser but more importantly it can sit as an application on any iOS or android device enabling patient information, VC-ability, and instant access to resources for both patient and clinician. The Waikato DHB technical and strategic team have worked hard with the American parent company to have an application that is suitable for the NZ environment. The app will be provided to Clinicians providing services within the Waikato and Midland regions including Specialists doctors and RMOs, Nursing staff and allied health professionals.

IMPLEMENTATION

Two key roles were created by the DHB of Executive Director of Virtualisation and Clinical Director of Virtual Healthcare, working closely with the CEO and the Director of Primary and Integrated Care. The implementation process is ongoing and complex, we have a team of change agents and IT professionals who have worked closely with the governance group to support implementation. Engagement with consumers, local and National Government and non-Government agencies and staff across primary and secondary care has been crucial as we endeavour to change the way we deliver health care.

OUTCOMES

We are in the early stages of the project which will run for 2 years (December 2015-December 2017) with the aim to move 30% of our outpatient clinics to virtual clinics. Our initial data is that 48% of 1000 patients surveyed in our Outpatient clinic were keen to consider a virtual way of having an outpatient consultation. To date 78% of Clinicians surveyed are feeling positive about virtual health (this survey is ongoing). The process has been conducted at speed and a corresponding sense of urgency has been created in line with Kotter's first steps of change, we have had a number of small wins within departments and would hope by October to have much more information on successes and failures within the project.

NEXT STEPS

A virtual after hours GP service will be available by the end of August. We have an active research arm with tertiary institution partners both locally and internationally and should have good information to share on the project by October.

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EHEALTH ENABLED NURSES PROVIDING “POP UP” MEMORY CLINICS AND MEMORY WELLNESS PROGRAMS FOR RURAL REGIONAL AND REMOTE OLDER AUSTRALIANS

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INNOVATION

This innovative E- Health enabled programme supports older persons take control of their Brain Health through a Nurse Practitioner supported, Registered Nurse led Memory Wellness Clinic and Programme enabling;

1. timely and early diagnosis of dementia
2. memory wellness and dementia prevention information, education, care planning, monitoring and review

CONTEXT

- In Australia the gap between discussing symptoms with the GP and diagnosis of Dementia is 3 years. The delay to diagnosis is longer in rural and remote communities with limited access to specialists. Currently 280 000 Australians, remain undiagnosed and unable to access vital treatments, information and support services with negative repercussions for all involved.
- Dementia prevention and Memory Wellness is possible. Lifestyle and chronic condition risk factors such as lack of physical and mental exercise, poor nutrition, smoking; alcohol overuse; high or low blood pressure, blood glucose and cholesterol levels, overweight and obesity, and presence chronic conditions increases the likelihood of poor brain health outcomes. The best way to have a healthy brain is to have a healthy body. Early intervention is key and starts with lifestyle modifications that address identified risk factors.
- This project aimed to address early and timely diagnosis of dementia and brain health promotion by providing support through cognitive testing, screening, general memory wellness information and education, social connectedness and mental health initiatives to support brain health for regional rural and remote older Australians in an e-health environment.

SOLUTION

- This programme has been built on the latest research findings in this field and covers all aspects of memory wellness and dementia care. It is a comprehensive programme that enables older persons to have an e-health enabled clinical assessment via videoconferencing, Telehealth equipment and Cognitive testing Apps installed to iPads, supported by an NP when required in a nurse led “Pop up Memory Clinic”. The clinic comes to their community; they are not required to travel hundreds of Kilometres to an expert.
- The focus of the 8-week Memory Wellness programme that follows the clinic appointment is on lifestyle modification to reduce risk and preventative health knowledge and actions to prevent long term conditions such as dementia or delay onset of symptoms. Where a long term or chronic condition exists such as dementia the focus is on addressing risk factors to delay symptom progression, prevent complications and acute exacerbations of conditions and support and improve co-morbidities and overall health for increased quality of life. The cognitive testing used via App in virtual or Pop Up RN led Memory Clinics identifies areas of brain function requiring attention and brain training Apps are tailored to support those areas of need. Consumers are loaned Fitbits and iPads for 3 – 6 months with 83 health promotion Apps installed including brain Training apps to enable them to follow their Brain Health Plans. The follow up clinic retests consumers and they can gauge their improvement and achievements against their goals set.

IMPLEMENTATION

- RNs have been trained in the Memory Wellness Program through an online Under Standing Dementia MOOC (Mass Open Online Course). Workshops have been conducted with our RNs and monthly supervision, case conferencing and Webinars are run by specialist clinicians for RNs.
- Referrals are via the My Aged Care Website and can be initiated by the consumer.
- This programme integrates with local services through the development of local pathways including specialist referral as available. Where no local referral pathways for diagnosis exists and the consumer agrees, the Nurse Practitioner can provide this service for the person in collaboration with their GP via video case conferencing. This enables both early and timely diagnosis as well as building the capacity for primary care to diagnose dementia in areas with relative lack of referral pathways for this purpose.
- All participants have access to the 8 week iPad enabled Memory Wellness Programme regardless of whether they have a diagnosis of dementia or not. This enables them to have access to contemporary, best practice information and education. Further, they are able to develop an individualised ‘My Brain Health Plan’ with follow ups as required and at 6 months post programme to determine their

'Brain Health Outcomes' using goal attainment scaling.

- Staff use a strengths-based and solution-focused approach which identifies the consumer's strengths, talents, capabilities and resources, supports enablement of the consumer to be independent and build self-autonomy. We do with people not for people regardless of service or program type. This approach places the consumer at the centre of the process and enables them to be an active part of the decision making process, whilst maintain their independence for as long as possible.
- An individualised My Brain Health Plan is developed with the consumer including agreed memory wellness strategies and interventions to be followed at home. The Plan includes health goals that support consumer motivational strategies to change health behaviours and focus on early intervention strategies. The consumer also receives support from clinician's who provide expert advice to the consumer regarding their health needs and how they may go about managing and or improving their brain health. E- Health promotion strategies are incorporated into the My Brain Health Plan and an iPad is loaned e.g. for Brain Training strategies. In this case Brain Training Apps, identified by consumer preference, are loaded into the consumers "My favourites" container on their iPad for easy access and monitoring. Lumosity, scrabble and magic piano are some favourite Brain Training Apps. The same is done for social connectedness, nutrition, exercise, mental health etc. All Apps chosen have peer and clinical review e.g. Brain Training Apps have been reviewed by the peak organisation in Australia and the Nurse Practitioner. In this way each person is able to achieve individual outcomes and active participation in their communities whilst maintaining their dignity through choice. Telehealth equipment can be installed in the consumer's home when required to monitor health indicators identified within the care plan e.g. Blood Pressure or Blood Glucose levels.

OUTCOMES

- For consumers living in rural and remote Australia, the chance to participate in a high quality programme equal to and more comprehensive than the services received by their urban counterparts is significant. They have access to clinical staff who specialise in dementia care, and have extensive experience working and delivering services in a rural setting. Carers also benefit as early intervention assists them with understanding and managing health and behavioural concerns, and the general burden of care as the disease progresses.
- Results from the prototype in Far North Queensland and Darling Downs demonstrates improvements for most consumers from base line in their cognitive testing after 6 months regardless of being diagnosed with dementia or not. Other results will be discussed in this session.

NEXT STEPS

Since February 2016 the programme is being rolled out to all states that the host organisation covers including Qld, NSW, ACT, Victoria and Tasmania

Evaluations of health promotion interventions often fail to capture important information about real-world challenges and the limitations of translating evidence-based results into behaviour change. In partnership with a University National Ethics approval has been received to research the effect of the programme on 200 participants.

This implementation research will:

- ensure older participants are receiving the best mix of program elements,
- ensure ability to assess and respond to any unintended consequences of the Memory Wellness Program,
- increase knowledge about "what works" in the delivery of dementia risk management programs

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HANDSUP - THE POWER OF EACH OTHER THROUGH VOLUNTEERING

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INNOVATION

HandsUp is a website based system which facilitates and simplifies the process of volunteering, in terms of searching for help and offering help. This free online volunteering network - www.handsup.nz - has been created to enable people registered at a general practice to contact and help each other.

CONTEXT

Volunteering is a growing global movement which involves a fundamental change in the way people as a society live together and in particular provide care to each other. HandsUp has been developed as part of a larger project looking at how general practices can provide more patient centred service models. HandsUp aims to connect people up with what they need and what they can offer based around a General Practice registered population.

Sometimes what is most important is quite simple social support, or help with small things.

This model of a volunteer network around a general practice has been developed to address such social need through enabling informal care, neighbourly help and neighbourliness.

SOLUTION

HandsUp is a website where patients at a general practice can link up with each other to ask for help, offer help or both. The decision to limit the membership to an enrolled general practice patient population was consciously made to create a sense of community and closeness that is lacking in larger organisation based volunteer services.

The administrative burden to the practice is low because once members are registered they manage their own offers and request for help by contacting each other. Safety to members is increased by the administrators knowing the members personally and through a formal vetting process for volunteers.

IMPLEMENTATION

Website development took almost a year because this is an innovative and technically sophisticated IT solution. Once development was complete the practice staff we're briefed as to the philosophy and functionality of HandsUp and interested patients we're either directed to the website to register interest or provided a hard copy registration pack.

OUTCOMES

The complexity of having a fully functioning web platform which on the surface looks simple and intuitive but underneath has a highly complex and sophisticated transactional structure took us much longer to develop than we thought it would. We also spent considerable time developing a robust and safe vetting process for volunteers which would allow rapid uptake but remain legally safe to users of the system.

It became apparent that the approval of members and approval of request/offers for help need to be managed by the practice staff who knew the patients. Without this personal knowledge of our patients we didn't feel the safety for patients could be maintained. It reinforced our initial view that this type of volunteering model is best kept to a specific general practice population.

We've also learnt we're going to need to actively "sell" the idea to our patients. Despite flyers and posters, the initial uptake of volunteers has been slow. It will need one-on-one conversations with our patients to bring them on-board but we believe once we reach a "critical mass" the system will take off.

NEXT STEPS

The next step is to seek funding to develop the functionality and capacity to offer the HandsUp volunteering service to any interested general practice. As it stands today HandsUp potentially could be made available to any general practice in the English speaking world (and I guess anywhere in the world if translated).

We already had considerable interest from other health organisations that recognise the potential health and welfare benefits of volunteering so look forward to giving a "hand up" to as many people as possible.

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HEALTH CARE HOME IN THE CLOUD

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INNOVATION

We built a modern patient management system (PMS) and integrated it with a single point of access (SPOA) referral coordination system and robust contracts management system (CCR). The result is a solution for funders, managers and clinicians that supports person-centred care for populations and individuals.

CONTEXT

General practice has changed significantly over the past few decades.

- An ageing population
- Sky-rocketing costs and squeezed resources
- Patients' desire to play a greater role in managing their health

The IT to support this has not kept up. Pinnacle Midlands Health developed its 'Health Care Home' model of care to help keep up with the change but needed a supporting IT solution.

The opportunity was to improve the server-based model for clinical data where clinicians were tied to a building, to complex shared records and to separate log ins. A secure cloud-based service would allow a single record and easier sharing, with mobile access.

For the system, primary health organisations (PHO) especially, there was a need to manage contracts and budgeted volumes in real-time and improve visibility of utilisation to target resource where it was needed most.

SOLUTION

We partnered with Valentia Technologies Ltd, based on their ability to offer a cost-effective, patient-centred, whole-of-system model.

Some of the value-add facets of the solution are:

Service funding/coordination perspective

CCR and SPOA A configurable, enterprise solution:

- Full contract management, including dynamic processing of service eligibility
- Centralised coordination services enabled by a SPOA
- Service utilisation tracking

Provider perspective

PMS Value-add features in addition to standard PMS functions:

- Support for standardising workflows, e.g. around triage and pre consultation checks
- Configurable patient-specific alerting
- Coding using SNOMED, including UI support for migrations from READ V2
- Use of NZF for medications, including UI support for transition from MIMS
- Immunisation function displaying as per National Immunisation Schedule by age, and supporting catch-up schedules
- Integrated health plan, enabling goals and team-based health planning
- Facebook-style timeline giving real-time feed of consultations with favourite views, filtering and search

Usability focus on delivering a system that requires minimal training and has accelerator functions for speed of workflow.

Shared care View/update of patient record could be made available to providers outside of general practice. Our central premise is that the patient controls who can see their data.

Patient perspective

Web/smart-phone based patient portal Patient portal provides a secure place for patients to communicate with care team, view their info and make requests.

Access to health plans, reminders, paying for services online, video calling and interfacing with remote monitoring and patient health apps are planned value adds.

IMPLEMENTATION

Following analysis of problems and opportunities, we adopted an iterative approach to design and development working in partnership with Valentia Technologies Ltd.:

- Storyboarding design sessions with focus groups of clinicians and stakeholders
- Prototyping of critical workflows and workshopping to refine these
- Consultation sessions across the Midlands PHO localities and international benchmarking to widen our ideas-base
- Involving users in testing and refinement of software iterations
- 'Training on the job' via simulation of the live running environment

OUTCOMES

Our needs for a 'mature' enterprise solution have meant understanding that we are on a journey to incrementally deliver on the original vision. We learned the importance of celebrating success and treating missed milestones as learning experiences. This helped the team keep the overall vision fresh in a long, ambitious project. There has been learning around joint planning and communication with an external vendor requiring ongoing reinforcement. The outcome is that we have a beta suite of software to support primary care.

NEXT STEPS

IT enablement is step one on the improvement journey. Realisation of benefits around person-centric care depends on collaboration with other providers and on significant change management.

Next steps are using the technology in support of PHO improvement initiatives. Real-life case studies will allow us to refine the product set and prove benefits of investing in this enterprise level solution.

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MOBILISING THE NURSING PROFESSION THROUGH A STRUCTURED BYOD PROGRAM

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INNOVATION

Mobilising the Nursing Profession through a Structured BYOD Program (bring your own device).

CONTEXT

Almost all patients are equipped with a smartphone or tablet. They can easily self-diagnose using "Dr. Google", share their progress through their healthcare procedure with friends and whanau and even broadcast their opinions on hospital food via social media. We have arrived at the era where almost all patients, in all demographic groups, are fully mobile.

Likewise, the doctors are mobile enabled. Their CME fund enables SMOs and RMOs to purchase the latest devices which are often used as the unofficial alternative to pagers and faxes. Most hospital teams now use their private iPhones to communicate instead of their pager, to share photos of wounds, capture patient notes and login to clinical systems remotely. Some of these solutions may be clunky but mobile journey is well underway.

Meanwhile, nurses live in an analogue world that has not changed much in decades. Most nurses don't have a mobile phone for work and need to rely on pool phones, pagers and faxes to communicate with doctors.

Notes are captured on paper and significant time is wasted each shift looking for patient files, observation charts and printing results. Even worse is the time spent compiling paper notes and doing manual data entry to electronic systems from the paper notes. Since the nurse is the primary care giver in most healthcare situations, this is time spent on non-care activities rather than being in the moment of care.

Sadly, nurses are not part of the exciting transformation that is happening in healthcare and they are working in an outdated analogue model in an ever-increasing digital world.

SOLUTION

Something needs to be change because patients will continue to become more savvy and more connected and a large portion of healthcare investment is focused on mobilising the roles of the SMO and RMO community.

So what about the nurses? Are they going to be saddled with paper forms and fax machines forever?

Fortunately, the answer is closer than people realise. In fact, the answer may already be in our pockets!

IMPLEMENTATION

Most nurses already own a smartphone, or a tablet, or both. These are generally personal devices and not used for work. However, with the right financial incentives, appropriate security and a good support and training model, nurses could be given the option of using their personal device at work.

There may also need to be an option of using a mobile device provided by the employer during work hours and some organisations are already well advanced with a shared device model - however sharing devices in healthcare is challenging.

The ideal scenario is that a nurse could purchase an appropriate device, with a financial incentive from their employer, and use that device during work hours and take it home for personal usage. The nurse would register the device to gain secure access to the apps needed to perform their role and receive technical support and training to ensure they can leverage the benefits. Outside work hours, the nurse is free to use the device for personal / family use with no interference from the employer.

OUTCOMES

Most of the RMOs and SMOs are already doing BYOD (bring you own devices) but without appropriate policy, security, support and governance.

BYOD is already widely adopted by many industries with the appropriate policies, security, support and governance. Notable successes are Air NZ, BNZ and Craigs Investment Partners where the penetration of BYOD is very high and balance between personal and business use is appropriate.

NEXT STEPS

This presentation will outline the 5 building blocks of a successful BYOD program to mobilise nurses in the same way that doctors, pilots, air hostesses, real estate agents and many others professions have been mobilised over the past 10 years.

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MAKING CLINICAL DECISION SUPPORT INTERACTIVE – FROM CLINICIAN TO CLOUD

Malcolm PRADHAN ¹

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INNOVATION

Clinical Decision Support (CDS) has a large evidence base that demonstrates its role in improving health care delivery, improving patient safety and supporting best practice. CDS is also a critical factor in achieving return on investment from health IT systems, as reflected in the HIMSS Electronic Medical Record Adoption Model (EMRAM).

In reality CDS is difficult to implement and not used routinely in health care outside of medication prescribing. Our goal is to make CDS accessible to clinical users so they can innovate within their health services. We have developed an innovative application that allows clinical teams to visualise their patients' data and interactively experiment with CDS. When finalised, they can push their CDS modules into a cloud based CDS engine to operate in real-time against patient data.

Our innovation allows clinicians to experiment and safely implement distributed CDS at scale without having to rely on busy IT staff, and without having to understand technical issues involved.

CONTEXT

The authors have been involved with developing CDS tools and technology for many years, and have realised that the barriers to adoption are not technical but the challenge of making CDS relevant to individual clinicians so they can apply CDS to their specific patient populations and automate tasks such as identifying a patient's clinical risk, highlighting candidates for chronic disease management, and identify problems with patient flow. We also realised that each specialty has their own concerns.

We worked with hospital partners in a variety of specialties, such as Emergency Medicine, Patient Flow and Chronic Disease Management to develop an interactive workbench that allows clinicians to view lists of their patients and visually author CDS which is applied to their patients' data in real-time. For example, they can 'flag' patients at risk of harm, 'tag' patients who are candidates for care programs or to simply identify sub-populations of their patients to chart. Once satisfied they can push their CDS to continue to work against the hospital data feeds and trigger workflows such as notifications and care plans.

SOLUTION

We have developed a solution that integrates with hospital HL7 feeds and maps them to a standard FHIR (Fast Health Interoperability Resources) model. We developed a highly interactive web-based displays a CDS 'playground', allowing clinical or support staff to easily implement business rules and scoring rules. The distributed CDS engine runs in the browser and on the cloud, while ensuring that CDS rules are safe.

IMPLEMENTATION

The CDS playground is implemented using a modern HTML5 single page application. The CDS engine is integrated with a .Net back-end and industry standard event bus. The CDS engine is designed to work with FHIR and standard terminologies such as Snomed-CT.

OUTCOMES

Health care is under growing pressure, but despite the array of available technology and algorithms it is surprising that CDS is not more commonly used in health care to automate tasks. We have found that an important factor of engaging clinicians is to allow them to apply CDS against their own patient's data in real-time, rather than a statistically oriented approach. It is much easier to relate to the impacts of CDS with patients that are currently under care and not abstract data points.

The main challenge of improving the adoption of CDS is integrating the outputs of CDS with clinical workflows. Unfortunately, because existing health IT systems often have limited interoperability, it can be a challenge to maximise the benefits of CDS.

NEXT STEPS

Our plans are to work with partners on evaluation of the benefits of implementing CDS in their health care organisations and better understand how we can make the system more approachable and easier to author for common use cases.

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IMPLEMENTING A REGIONAL TELEHEALTH SERVICE: SHOWCASING CENTRAL REGION TELESTROKE.

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PROJECT BACKGROUND

Telemedicine is the concept of remote assessment, diagnosis and treatment of patients with the use of telecommunication technology. This project focuses on using video/tele-imaging equipment to enable after-hour's access to stroke thrombolysis for patients suffering an acute ischaemic stroke. Stroke thrombolysis with intravenous Alteplase, a thrombolytic or 'clot busting' medication, helps to reduce post-stroke disability, but is time critical needing to be administered within 4.5 hours of symptom onset, and can be potentially harmful especially if used inappropriately. Currently some regional hospitals do not have 24/7 access to a Neurologist or Physician specialising in stroke to provide expert supervision for this treatment. The telestroke project is aimed at improving patient access to high quality thrombolysis services through virtual attendance of a stroke expert through the use of videoconferencing technology. With telestroke this can occur within mere minutes of being alerted, can happen anywhere, and anytime.

METHODS

In 2015 the Ministry of Health invited expressions of interest from DHBs to participate in a NZ telestroke pilot resulting in the selection of five hospitals in Central NZ to set-up a hub-and-spoke model of care.

Hospitals that forms part of the initial pilot include Wellington Regional Hospital (WRH) as the hub and four spoke hospitals: Wairau Hospital (WH), Nelson (NH), Palmerston North Hospital (PN), and Hawke's Bay Hospital (HBH).

Videoconferencing equipment and service is provided by Vivid Solutions.

Cases are and reports generated using MS Access Database and feedback is recruited from clinicians and consumers throughout the pilot.

Each case is discussed by regional stroke leads and other interested clinicians on a monthly basis for quality assurance and three monthly regional educational sessions attended via videoconferencing provides more detailed discussions and shared learning around the most challenging cases.

SERVICE DESCRIPTION

When a patient presents to one of the participating emergency departments during telestroke service operating hours (week-nights 17:00 to 07:59 and all day Saturday, Sundays, and public holidays) and is deemed a potential thrombolysis candidate the following steps are taken:

- (1) contacting the Wellington Regional Hospital call-centre to page the on-call neurologist,
- (2) moving a portable (self-powered and WiFi) Telestroke unit to the foot of the patient's bed and turning it on
- (3) ensuring a local doctor (usually a medical registrar) is by the patient's bedside to assist the remote doctor with patient interview, examination and drug charting.
- (4) The remote neurologist uses a 3G iPad to dial into self-powered and wireless specialised equipment at the patient end as soon as they have been notified. The equipment is hosted on the Vivid Solutions secure and fully managed national health network.

During the assessment a CT head is obtained as per usual protocol and the remote stroke experts reviews the CT via PACS. PACS images are 'pushed' by regional hospitals to the Wellington PACS server immediately upon completion of the scan. After the scan the remote expert makes a treatment decision in discussion with the patient and family, communicates a post-thrombolysis care plan with the registrar, disconnects once the treatment has started, and then generates a written report.

CONCLUSION

This project show cases the successful implementation of a regional telehealth service and is the first telestroke service in NZ. The

presentation will include a detailed description of service set-up, step-by-step description of a typical patient encounter, and pilot evaluation results looking at impact on patient care and broader service impact.

Current funding: The pilot has been funded by the MOH with CCDHB contracted to lead the project. The VC units, service charges and project management are paid via the MOH contract

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MOBILITY: FROM THE BOX TO THE BEDSIDE

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INNOVATION

Waitemata DHB has been implementing a range of projects dependent on mobility, including nurses administering medications across all adult wards at North Shore Hospital using ~300 tablet devices. Nurses are using the same devices on a pilot ward at Waitakere Hospital to capture patient observations & assessments, and an additional 120 devices are used by community clinicians to access a range of applications when visiting patients' homes.

CONTEXT

There are some significant challenges to overcome before paper can be relegated to the recycling bin in favour of mobile devices. Continuous coverage, resiliency, security, usability, infection control, charging, and handling, are all issues which must be addressed before tablets can become serious contenders for supporting clinical workflows.

For clinicians, the challenges include what happens when they unwrap and turn on a new device – how do they connect to the network, access the clinical record and look up patient results?

SOLUTION

Over the past 2 years Waitemata DHB has been establishing a Mobility Strategy that includes the layers required to support clinical uses of mobile devices, such as integration, security, authentication, connectivity, policy and mobile device management (MDM). For many users the ideal model is Corporate Owned, Personally Enabled (COPE) devices, due to the significant potential this has to improve communication with individual clinicians. Our nursing devices currently are Corporate Owned, and Shared. While this model takes away responsibility for charging & storage, there are a number of other complexities that need to be addressed e.g. who is responsible in case of loss, breakage or theft, content stored on & accessed via the device. On-going support for devices is also an issue.

IMPLEMENTATION

By adapting a commercially available case, creating a custom designed magnet, and some stainless steel stands and wall plates; we were able to create a solution that addressed all of these issues at a fraction of the cost of products on the market. The devices are stored neatly in charging racks in medication rooms behind swipe access doors, and have screen protectors so the entire device & case can be wiped with anti-microbial wipes.

The devices are secured using a combination of the in-house MDM and local restrictions that prevent users from modifying settings, downloading or removing applications, or accessing non-permitted sites. Solutions have been put in place to manage device-related problems, and to provide end user-support.

OUTCOMES

The experience we have gained over the past two years is highly transferrable to other organisations planning to implement mobile devices for clinical use.

The tension between security & practical usability is even more fraught with mobile devices. For example, while desirable to have the shortest possible auto-lock time this creates immense frustration when the device times out while walking to administer medication to a patient.

Fears of loss or theft have so far been unfounded. Prominent labels on the device stating it will be rendered useless if stolen, combined with a unique rugged appearance and an unexpected sense of ownership & pride from the clinicians, have led to no loss or breakage in the 6 months since implementation.

From a clinician perspective, both the inpatient & community deployments have dramatically improved access to information at the point of care.

NEXT STEPS

A steady stream of functionality available via the ward devices is planned including the rollout of electronic nursing assessments/ observations. A custom designed application for electronic Prescribing on the devices in native mode will offer significant improvements to usability, and will be able to take advantage of bedside barcode scanning using the device's camera in the future.

A Mobile Enterprise Application Platform (MEAP) and APIs will further open up the device to other uses & users. Actively being considered are the use of devices in rehabilitation, Citrix portability, and the addition of a nursing reference manual.

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FightingTheFever - Our Story of Mobile App Development

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The Fight the Fever mobile application concept emerged from the Health Hackathon in 2015. Dr Alison Leversha, Community Paediatrician recognised that adherence to prophylactic monthly penicillin in young people with Rheumatic fever dropped rapidly as teenagers transitioned from youth focussed public health nursing to adult district nursing services. Bicillin injections are needed every 28 days for at least 10 years to prevent a recurrence of Rheumatic fever with associated risk of further heart damage and potentially life-long morbidity. The solution? To partner with young people receiving treatment for Rheumatic Fever, The Health Innovation Hub and Enspiral Services with an inquisitive culture, allowing the emergence of a set of requirements that put youth at the centre of managing their illness and treatment.

'Fight the Fever' is a co-designed hybrid mobile application. Young people can request and book their appointments, contact clinical staff (without having to remember any phone numbers), rate their injections, plan ahead, and see how their 'protection' against Rheumatic Fever stacks up. The app provides notifications to ensure young people get their injections or contact the clinic/nurse if late. The co-design process elicited how much young people (primarily Māori and Pasifika youth/young adults) wanted non-confrontational ways to express their experience of the injections. Therefore, the application built in an injection rating system that can anonymously give feedback to nursing staff.

The Challenges? Multiple electronic health records used by nursing and primary health care services, unclear privacy and security requirements, regional rheumatic fever register programme, hosting arrangements, IP, funding, lack of dedicated time for health board staff to participate in the projects, ongoing funding and service arrangements.

The opportunity? To exemplify agile philosophy in a non-agile world. To work iteratively, prioritise and have young people test and feedback in real time, to show it is possible to do 1 or 2 things well, test and see what happens. To not tackle what you can't change (such as a challenging service delivery model) but put your energy where there is flow.

The team: our fabulous young people, nurses, community workers, paediatrician, developer, designer, health informatician and staff at The Health Innovation Hub.

The tools and resources: a facebook group, angular framework, health information security framework, the health information privacy code and some willingness from a friendly DHB CIO, solution architect and new friends along the way.

The results: Well they say a picture paints a thousand words. [Check out our wireframes here.](#)

A working application (ready for trial) 3.0 months from the start of development. Our process allowed friendships to develop and reminded us all of the importance of community as our co-design youth enjoyed the experience of meeting others 'like me' and working together to create something with a social purpose.

The next steps:

- Real world use /trial of the application with a robust evaluation methodology
- Exploration of funding streams
- Friends and Whanau chat functionality
- Further iterations of development based on feedback from the trial

We want to share what we have done and what we learnt. The presentation will cover the clinical, technical and social learnings from our experience. There will be things we haven't quite got right yet and in the act of sharing to this group, we hope there will be a transfer of knowledge that engaging with peers and likeminded individuals will enable.

We thank you for your time in considering coming to our presentation. We believe we have achieved something that will make a difference.

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THE USE OF AN ONTOLOGY BASED HEALTHCARE ANALYTICS PLATFORM

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INNOVATION

The development and use of an ontology based healthcare analytics platform which processes structured and free-text healthcare data to perform a variety of essential healthcare functions and workflows.

CONTEXT

A pilot project in the radiology department used the platform on a set of more than 13000 records to identify those patients which required further investigation based on imaging study findings.

SOLUTION

The Hewlett Packard Enterprise healthcare analytics solution (HCAS) accommodates structured and free-text healthcare data through underlying big-data platform component technologies. The UIMA based text processing framework includes an ontology tagger with Systematized Nomenclature of Medicine (SNOMED-CT, <http://www.ihtsdo.org/snomed-ct/>) and International Classification of Diseases (ICD, <http://www.who.int/classifications/icd/en/>) mappings to annotate clinical concepts. The user-interface enables visual query construction including operators, nesting, load/save, and sub-query macros. Aggregate query results are displayed in a variety of visualizations and fully detailed EMR record rendering is available for every record within the result set.

IMPLEMENTATION

A static data extract of patient information for 13601 radiology reports was created. This extract included relevant patient information (name, UID, age, gender), as well as all subsequent radiology reports for each of these patients. The HCAS UI was configured for 12 data elements within the extract schema, and this data was ingested into HCAS. Unstructured and semi-structured data was passed through the ontology tagging and context processing pipeline.

In this application, the lead-radiologist built a cohort of at-risk patients through an interactively developed query which combined parametric and conceptual terms. Criteria included SNOMED concepts, text-based regular expressions, and structured parameters.

After query construction, the resultant cohort was made available through the HCAS UI so that a team of radiologists could determine follow-up status and required action, if any. HCAS included several mechanisms to facilitate this task including displaying all EMR notes in a single view, and automatic highlighting of the query concepts, which allowed for rapid navigation and abstraction of patient records.

OUTCOMES

This was an opportunity to use natural language processing software to find radiology reports that required further investigation. Query filters designed using American College of Radiology literature concepts resulted in a filtered cohort of less than 25% of total records. Sampling the rejected records enabled dynamic filter refinement and provided a statistical check on the validity of excluded records.

The filtered result set limited radiologist review to a manageable subset for which the computer assisted chart review features then enabled rapid chart abstraction. Collaborative workflow processes allowed radiology teams to efficiently work through the record set and provided excellent visibility to their daily progress. Substantial improvement over traditional methods were noted.

NEXT STEPS

The successful radiology pilot completion led to an enterprise wide deployment which is now in process. The expanded deployment uses several model use-cases for decision analysis of system configuration. The resultant system will enable analytics across a broad range of departments and diverse applications such as assessing radiology referral utilization, population surveillance for clinical conditions, and improvements in clinical coding assignments.

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A QUALITATIVE STUDY TO ANALYSE RELATIONSHIPS OF FUNCTIONAL CROWDING TO RHEUMATIC FEVER USING A BESPOKE DESIGNED APP ON A TABLET DEVICE

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Keywords: Rheumatic Fever (RF), app, tablet, functional crowding, qualitative study, Wellington, data collection, face-to-face interview, house plan, architecture, public health, housing, Pacific, Maori, Health Research Council, Ministry of Health, patient perspectives, infectious disease, acute rheumatic fever, rheumatic heart disease, crowding, sore throat, iOS, mixed methods, Lua, Dropbox API, built environment, sleeping arrangements, energy poverty, throat swab, interagency, Social Sector Trial, housing assistance

INNOVATION

Mixed research methods, including in-depth interviews with 85 households (consisting of 326 people) combined with customised house-plans on i-Pads were designed to explore the effect of the built environment on daily living arrangements. A tablet application and data collection system was built to investigate housing and crowding effects of Rheumatic Fever (RF). The design complexity of collecting qualitative data for this study required an innovative collaboration between Public Health and Architectural specialists. The application fuses architectural mapping with technology, built in Lua and connects to Dropbox API (Application Programming Interface).

CONTEXT

The Household Crowding and Rheumatic Fever Study (aka Housing Effects About RheumaTic Fever or Heart Study) was funded by the New Zealand Health Research Council and the Ministry of Health. Participant face-to-face interviews were conducted in a region of Wellington, New Zealand with high prevalence of acute rheumatic fever. Seventy households were considered the 'index' households, as they met the inclusion criteria of one or more children enrolled in the Ministry of Health's throat swabbing programme. The study aimed to determine how household living arrangements may contribute to increased risks of RF. It also identified what protective factors contributed to health and wellbeing. It was not designed to establish specific causal factors for RF. The richness of information to be collected, coupled with the need to standardise data justified a paperless solution. Whanau were also offered housing and heating assistance packages that were administered through the Regional Public Health, Well Homes Service and funded by the Porirua Social Sector Trial.

SOLUTION

Using a customised iPad app, participants of each household were asked to draw a 'house plan' of their home and to include living areas and bedrooms, household furnishings and appliances, such as beds and heaters. Measures of the living areas and bedrooms using a laser ruler were also taken by the participant and researcher, the details of which were then tagged to the house plan. A series of discussion prompts via pop up menu on the application were designed to facilitate the fluid and spontaneous interactions of the interviewing process. Data was saved intermittently throughout the interview to a server accessible to the researchers. This was necessary to allow the house plan drawings, objects and tags to be viewed and edited during and after the interview.

IMPLEMENTATION

The front end application was developed for iOS Ipad written in Lua, compiled in XCode and distributed on the Appstore, with access to the app granted to interviewers. It connects to the dropbox API for data saving and retrieval features. Dropbox was chosen as the data depository for its ease of use and scale of the project.

The recording interface was implemented using an infinite and scalable grid system that the house plan was based on, as well as providing the structure for objects to sit on. By standardising objects onto a grid, the drawing achieved a sense of scale and structural order, and reduced the complexity of data.

OUTCOMES

Method

This qualitative mixed methods study was the first attempt of its kind to investigate the characteristics of functional crowding and its association with Rheumatic Fever. Developing a methodology for iPad that allowed participants to create visual reproductions of their houses and to chart specific details such as family events, routines, sleeping arrangements, heating and fuel costs was achievable with the utilisation of the iPad application. In addition, the majority of participants expressed an overwhelmingly positive experience of using the iPad because it was easy and interesting to use. As such, the data collected is rich in detail, resulting in a large database of information.

Household routines

There were fluctuating numbers of people in most households; in a third of households the number of people was matched to the appropriate number of bedrooms, but in a third of households participants stated that they needed additional room(s) with the level of crowding often increasing in the weekends. As cohort and case-control studies have shown that household crowding is strongly associated with close-contact infectious diseases, a cause of concern in this study is that the median number of people in the 3-bedroom houses was 5.3 people with the maximum reported regular number of people in the houses being nine. Occasionally, almost two-thirds of households (62%) included people who slept in the lounge due to cold temperatures and crowding in the bedrooms.

Family arrangements to promote health

Most households were able to describe household practices designed to keep their children well, in addition to problems that they realised were hazards for their children's health, including having insufficient income to heat their houses.

NEXT STEPS

Future projects will improve on the data collection system such that analysis is more seamless. Constraints of data input which do not impede the qualitative nature of the study will need to be devised. Greater intelligence will need to be developed in the back end systems such as using machine learning and statistical methods, and is necessary to analyse qualitative data at large scales.

This study was conducted in association with Dwell Housing Trust and Tu Kotahi Asthma Trust.

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HOW TELEHEALTH HAS REVOLUTIONIZED RENAL HEALTHCARE DELIVERY: A LOCAL EXPERIENCE

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INNOVATION

Telehealth was utilised locally to enhance direct patient care, inter-professional communication and medical education. Traditional face-to-face clinical consults and meetings were expanded and enhanced virtually using tele-video links between hospitals, telephone consultations and HealthTap (a commercial electronic virtual consult platform).

CONTEXT

Our renal unit covers a vast catchment area with widely dispersed satellite units. The hub-and-spoke model is used to deliver medical care: the main hospital provides conventional face-to-face clinical input with clinicians driving or flying over to run marathon all-day outreach clinics. Patients may also travel if specialty input is unavailable locally at the time. Staffs from these satellite units also travel to the hub for meetings and ongoing professional education. This setup (involving frequent long-distance traveling) is expensive, time-consuming, weather-dependent, disruptive, tiring and entails some travel risk. With an ever-growing renal service, innovative and cost-effective solutions are called for.

SOLUTION

Real-time virtual remote consults and virtual meetings were set up in phases. Initially, virtual video clinics were set up with a suitable nominated satellite renal unit (complimenting existing renal outreach clinics). An afternoon monthly, the physician remotely video linked from the main hospital with patients and nurse in the distant unit, using the secure Cisco-Jabber link. The nurse performed patient observations, medications reconciliation, document filling, fluid assessments and examinations. Prescription changes by the clinician were scanned back. The virtual interface was also expanded for monthly dialysis blood results review, virtual dialysis ward rounds, clinical assessments and urgent patient-family-doctor meetings. Soon after, telephone clinics were set up for selected outreach kidney transplant patients. Recently, virtual patient consults were run by dietitians, transplant nurses and pre-dialysis nurses. The inter-professional interactions were also greatly enhanced (with regional units dialling in to connect centrally) with virtual meetings (to discuss patient care) and education tele-links (journal clubs).

IMPLEMENTATION

Telehealth's introduction was carried gradually and the participation of patients and staff were all voluntary. The inter-hospital video consultations occurred first and telephone clinics soon followed. Crucial elements in the implementation process include: a clinical champion, support from Information Technology (IT) and buy-in from management (to fund equipment such as webcams and extra computer screens and to work out the cost-reimbursement of virtual clinical activities).

OUTCOMES

Telehealth has been a resounding success, with significant time and cost savings. The video outreach clinics alone resulted in savings of 2 hours travel time and NZD\$914 equivalent expense (per physician, per half-day clinic). Virtual clinics also permitted flexibility; allowing half-day sessions with no travel risk. This reduced fatigue from both long-distance travel and working all-day clinics. The monthly virtual blood reviews freed up time in the main clinic whilst impromptu clinical consults and patient-family-doctor meetings were invaluable. Questionnaire feedback survey from both staff and patients were excellent. The roll-out to dietetics, transplantation and pre-dialysis care has been well received. Staff communications, meetings and education were all enhanced with better overall attendance. All these translate to increased care quality for patients and improvement in both work efficiency and environment for staff. Initial technical issues were quickly resolved by supportive IT staff. Patient selection became important as not everyone was suitable for virtual consultations. However, the main challenge is in changing pre-existing attitudes to embrace telehealth as a safe and cost-effective tool to enhance renal healthcare delivery.

NEXT STEPS

Virtual consultations will be extended to cover other satellite renal units and to involve the entire multi-disciplinary team (including trainees and social workers). The limitation then would be in finding suitable venues and good support staff. Other potential future developments include virtual procedural mentoring (with distant hospitals), virtual problem solving (for home dialysis patients) and virtual

international specialty clinics with the developing world. The recent introduction of HealthTap locally would help expand the programme to enable secure consultations of patients from the comforts of their own homes, using their own personal computers or mobile devices; negating their need to even come to hospital.

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DATA QUALITY AS A CURE FOR WHAT AILS AN ORGANISATION

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INNOVATION

By implementing a 360° view of patient and provider data, we helped transform the quality of care. This resulted in patient safety and involvement, a fuller picture of the patient's Care Team and health record, physician data accuracy and ownership, and increased profitability.

CONTEXT

Statistics surrounding data problems across healthcare organisations are astounding:

(Based on US statistics)

- Patient records mismatched anywhere from 7-20% of the time
- Duplicate patient records cost health systems approximately USD\$60 each
- Patient Portal use at only 36%
- Hospital personnel update 10+ different systems for one provider's data

While these seem like pages from a CIO's bedside horror novel, they are a reality and can result in incorrect care, millions of wasted dollars, and regulatory risk.

SOLUTION

We implemented small changes that make a big difference for our customers, physicians and patients.

This was achieved by:

- Creating a data foundation for analytic pursuits such as Population Health, Predictive Care and a new Quality Payment Program
- Exploring how existing workflows such as Patient Registration, Referrals and Provider Credentialing can be streamlined
- Discussing a best-practice implementation plan for true data empowerment, starting with Patient and Provider and extending to other sources
- Learning how data quality enables sharing and interoperability, resulting in better care across many health systems and populations

IMPLEMENTATION

The solution that was implemented includes the following:

- EMPI solution for patient identification and matching
- Provider Registry with self service capabilities
- Circle of Care to manage the relationships between patients and all of their healthcare providers

OUTCOMES

- Consolidated over 50 instances of EMPI to a global instance
- Improved matching accuracy by ongoing tuning of a global instance with customer specific over-rights
- Improved customer satisfaction through improved data steward interface

NEXT STEPS

- Further improvements in workflows and matching accuracy
- Further improved customer satisfaction through further bespoke configuration for the various teams interacting with the solution.

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VOICE-TO-TEXT TECHNOLOGY

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The existing process of transcribing, approving and distributing documents often involves double handling, delays and backlogs. Turnaround times for documents can be slow, with a backlog of documents waiting for transcription causing delays in information availability.

SOLUTION

To solve the challenges of care and cost a single system was created for document creation, management and distribution. This is integrated into supporting systems such as the DHB Patient Administration System to automate data entry where possible.

Clinicians can opt to use front end speech recognition which allows them to edit their documents as they create them for rapid approval and dissemination. Other clinicians continue to dictate as before, their audio files are processed with back end speech recognition and DHB transcriptionists edit documents rather than creating them from scratch. Clinicians also have the option of using a mobile device to capture patient data through dictation and images.

Distributions are secured through industry standard HL7 messages. Access to documents is carefully controlled, appropriate authority is required to access a document.

IMPLEMENTATION

After initial trial, a sample of clinician authors and transcription staff were chosen for stage one implementation. It was important to provide a real world environment for testing and uncovering issues, as this was the first implementation in New Zealand. This provided sufficient document volumes to extract data on the efficacy of the system within the complex interconnecting systems and elements of workflow in the DHB.

Throughout the implementation, all efforts were made to prevent disruption to clinicians' workflows. Clinicians could retain their existing dictation processes and let back end speech recognition process their audio. However, front end speech recognition and other efficiency tools were available for clinicians who wanted further efficiency. A steady adoption of these has begun and will continue over time.

OUTCOMES & LESSONS

The stage one rollout is seeing efficiency gains. An average document takes over 20% less time to transcribe with speech recognition - from 5 hours spent on each hour of dictation to 4 hours/hour. Clinicians get access to information (such as clinic letters and operation notes) faster. The system introduces standardised document templates for consistency and quality. Each document has a visible audit trail from dictation to dissemination, and the ability to determine, for example, that all patients in a certain clinic have had all documents completed. Transcriptionists using the system have noted improvements over the previous documentation processes. Data provided by the system provides visibility of bottlenecks in the documentation process. Delays are identified and resolved as they arise. The system allocates work efficiently between transcriptionists and urgent documents can be prioritised.

Communication tools within the system allow clinicians and typists to give feedback to each other. This has led to further performance improvements as unhelpful practices are corrected and tips/tricks shared.

WHERE TO FROM HERE

Stage two of the project is underway with a department by department rollout. By August 2016 over 170 users are expected to be using the new system and a larger evaluation of effectiveness will be conducted. The DHB will continue using performance data from the system to refine its processes, improve turnaround times, reduce costs and ensure the right information is available at the right time in the right place.

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UNLOCKING BIG DATA IN THE REDUCTION OF UNPLANNED READMISSIONS REALTIME

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INNOVATION

We partnered with Advocate Health, the largest Accountable Care Organisation in the USA, to develop a real-time predictive model that stratifies newly admitted patients risk of a subsequent unplanned readmission. This model was validated with a large cohort of de-identified EMR data. Workflow tools integrated into the Electronic Medical Record (EMR) were developed to manage at risk patients, with the predictive score calculated close to admission through to discharge using a cloud based population health platform. The innovation has expanded to include the Society of Hospital Medicine's BOOST (Better Outcomes by Optimising Safe Transitions) criteria, incorporating additional workflows within the EMR, to further improve discharge planning for at risk patients.

CONTEXT

One area of health system improvement under pressure from the push to value based payment models in the USA, is identifying and better managing those patients at risk of an unplanned readmission. The federal insurance program, Medicare, has reduced payments to those acute care hospitals with an excess rate of readmissions since 2012. For some, this can amount to hundreds of thousands of dollars as well as the obvious impact to the patient and their careers.

There are many predictive models looking at downstream unplanned readmissions risks. Advocate Health sought to develop a high performing real-time all-cause risk model leveraging EMR data and the ability to manage these patients using the EMR. To achieve this, a partnership was created leveraging Advocate's experience in integrated care and an information technology provider's expertise in developing population health solutions.

In New Zealand and Australia, there is variability in rates of readmission (from 5.5– 12% from Health Round Table data July 2013 to June 2014) and in general, a desire to improve on these. Various payment and penalty models are being discussed in different ANZ regions and it is anticipated that such information technology approaches will support these improvements as it has in the USA.

SOLUTION

The first task was to develop a high performing predictive model. This started with a literature review and extraction of EMR data to identify risk factors for unplanned readmission. External validation was undertaken using a large de-identified patient database (comprising of over 50 million records contributed by 480 health systems across the US). Two models were developed, one for admission and one for discharge. The models were iterated and demonstrated to perform well (C-stat of 0.76 - 0.78) and this has been published.

The second task was the development of workflow dashboards within the EMR to enable "readmission perfectionists" to manage patients at risk and capture discharge planning arrangements etc. back into the same record.

The model was refined and activated in a cloud population health management platform, leveraging normalised patient data from multiple clinical systems.

Additional criteria to support transition of care arrangements defined by the Society of Hospital Medicine (BOOST) were added into the EMR to enhance the management of patients at risk.

IMPLEMENTATION

In June, 2013, just 10 months after the readmission project kickoff, Advocate launched the cloud-based readmission algorithm into their Millennium platform at their first hospital and the roll out continued to 8 Advocate hospitals by mid-2014.

The BOOST criteria were added as part of a collaboration with Northern Arizona Healthcare. This required significant understanding of care management processes as EMR assessments and other tools were added.

Under the partnership with Advocate Health, the risk model and workflows were available for other health systems to be implemented. 28 health systems with over 180 facilities are now live in the US with 16 more health systems in flight to do so.

OUTCOMES

By the end of 2013, Advocate reduced readmissions for COPD patients by 50 percent and by 16 percent for congestive heart failure patients. As a result, Advocate has experienced a 20 percent reduction in readmissions overall. It also saw their readmission penalties drop to 13% of at-risk dollars.

With the addition of BOOST in Northern Arizona Healthcare, Congestive Heart Failure readmissions have been reduced from 22.2% to 11.3% in 2014.

NEXT STEPS

To adapt the predictive model for Australian healthcare environment.

Develop a model that covers predictive factors for Potentially Preventable Hospitalisations rather than just unplanned readmissions.

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THE NATIONAL TELEHEALTH SERVICE: A NEW PLATFORM FOR VIRTUALISING CARE IN NZ

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New Zealand's new National Telehealth Service (NTS) is a major success story, demonstrating how information technology can be applied to support new models of care at scale. In 2015/16 the New Zealand government commissioned a new National Telehealth Service (NTS). Led by the Ministry of Health with the support of ACC, this involved bringing together hitherto separate health and counselling services delivered by a range of commercial and not-for-profit organisations into a single national operation to achieve better health outcomes for New Zealanders. The Ministry saw the potential for telehealth to support new models of care and pursued this vision through a competitive dialogue process. After extensive dialogue, the contract for the new NTS was awarded to Homecare Medical, a local health provider, in mid-2016 and the service went live as planned on the 1st November last year. It has performed strongly since Day One and continues to develop, with a strong focus on service innovation and improvement working in partnership with wider sector stakeholders. This is the story of how this success was achieved and where the National Telehealth Service is heading, including what we see as the key challenges to 'realising the promise and potential' of telehealth.

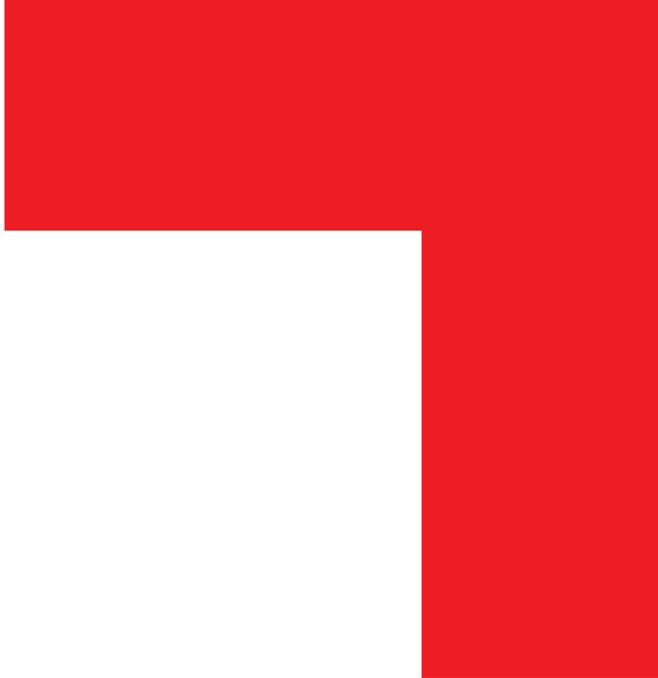
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Poster Presentations



IMPACT OF A PRIVACY EDUCATION CAMPAIGN

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3. Waitemata DHB, New Zealand

INTRODUCTION

The risk of using USB sticks to transfer and store clinical information is seen by the Auckland Region DHBs as a serious one and as part of mitigating the risk of use of non-encrypted devices the region conducted an education campaign. This project was set up to see if there was a demonstrable effect on the knowledge about use of USB sticks and the reported use of such devices as a result of the education campaign.

USE OF TECHNOLOGY AND/OR INFORMATION

Staff at the three Auckland region DHBs were approached to be interviewed about their knowledge of and use of the USB device. A semi-structured inquiry process was utilised.

IMPLEMENTATION/PROCESSES

60 participants were engaged at each of the DHBs. They were happy to provide their views. All were aware what a USB stick was. The proportion of staff using them to store data was obtained and differences across sites and staff type analysed. Awareness of the information risks of such devices were measured and respondents were asked if they recalled the campaign and if so what impact did it have on them and in particular on use of encrypted device.

CONCLUSION

Results indicate that though there is a high awareness of use of a USB and a reasonably high perception of the risk of use the campaign itself had little impact on actual practice including the mitigation of risk by using encrypted USB devices.

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ECAMPAIGNS: TRANSFORMING MEDICAL EDUCATION FOR DOCTORS

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INNOVATION

Waitemata District Health Board (DHB) is using eCampaigns as an aid to curriculum design for early post-graduate doctors or resident medical officers (RMOs). We integrated a 'learning bite' into our weekly newsletter. Using analytics, we can track the most relevant content to our consumers and integrate this into their blended curriculum in real time.

CONTEXT

Medicine is evolving rapidly, yet traditionally medical education is left playing catch up. There are signs, however, that this is changing. Some argue that it is because of a lack of resources that innovation can flourish in medical education. Recent examples include multimedia think tanks like Stanford MedX, events such as the Dundee Hackathon and the Free Open Access to Medical Education (FOAM) movement. FOAM consists of educational materials from an array of sources: online videos, blogs, podcasts, tweets, text documents, photographs, and Facebook groups; yet it exists independent of platform or media. It is an ethos, a globally accessible, crowd sourced educational adjunct. The explosion of FOAM over the past three years has seen the appearance of a wealth of free, easily accessible digital resources.

We support and educate approximately 120 doctors who rotate between departments and often organisations on a regular basis. The nature of their extremely busy roles involve working unconventional hours and for these reasons effective engagement is notoriously difficult. Their knowledge grows rapidly and their clinical interests are often diverse at this early post-graduate stage in their career. We found traditional methods of educational user needs analysis yielded generic answers, affording us little insight into the specific needs of doctors we support.

SOLUTION

We initially saw eCampaigns as a cost-effective way to engage this transient, technologically adept, part of our workforce. Our original focus was on promoting career opportunities and educational events within the DHB. We quickly realised that integrating FOAM content and using eCampaign analytics afforded us a unique insight into the educational needs of our junior doctors. Content is selected from pre-approved reputable resources and reviewed by clinical staff prior to circulation. Content is selected either to test a hypothesis (for example, are our learners more interested in community or hospital management of this condition?) or to embed and augment face-to-face learning.

IMPLEMENTATION

As new RMO doctors arrive in our organisation they are automatically subscribed to the eCampaign. Administrative time to construct the eCampaigns and strategise proposed content was absorbed by existing roles in our team. We used analytics to identify the timeframes to send eCampaigns which captured wider engagement from our users. User access is tracked and analysed to inform future content delivery.

OUTCOMES

- We found a novel, effective method of providing learning materials while gauging educational needs.
- The implemented solution is feasible and sustainable. No software installation, training or initial cost outlay was required.
- eCampaigns present a secure solution, viable for healthcare organisations as information is stored via MailChimp and so wholly independent of servers containing patient information.

NEXT STEPS

Expanding the use of eCampaigns within our organisation.

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STAFF PERSPECTIVE ON THE USE OF TELEPSYCHIATRY SERVICE FOR AN URBAN ABORIGINAL COMMUNITY CONTROLLED HEALTH SERVICE IN SOUTH EAST QUEENSLAND

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AIM

The Institute for Urban Indigenous Health (IUIH) implemented a telepsychiatry service at one of its Aboriginal and Torres Strait Islander Community Controlled Health Service (ATSICHS) located in the Brisbane suburb of Northgate.

This service allows a patient attending the Aboriginal Medical Service (AMS) to have a video consultation with psychiatrists located at a distance. This service was implemented over 12 months ago and to date has provided 102 psychiatric teleconsultations. Forty five consultations have been booked but cancelled during this period. The aim of this study was to assess the clinic staff's perception on the utilisation and effectiveness of this service.

METHODS

Both quantitative and qualitative methods were used in this study. Perceptions of the telepsychiatry service were obtained by surveying all clinical staff including: Care Co-ordinators, Aboriginal Health Workers (AHW's), nursing staff and medical staff. In addition, semi-structured interviews were undertaken with specialist psychiatrist who provides the teleconsultations.

RESULTS

Participant surveyed – 3 Psychiatrists, 3 GPs, 1 Nurse, 1 Allied health coordinator/ Health worker, 1 Telehealth Champion/Care Coordinator and 1 Clinic Practice manager/Nurse. Clinic staff identified the use of the telepsychiatry resulted in: a reduction in waiting time to see a specialist when compared with face-to-face consultations; patient adherence to care and continuity of care also improved when using tele psychiatry. Further, clinic staff felt that telepsychiatry improved their clinical knowledge and that Medicare re-imburements meant the service was financially sustainable. Some of the direct clinical impacts were reduction in anxiety and stress for the patients, along with better engagement with clinical recommendations Telehealth was not used as a mode of health care delivery for psychotic or aggressive behaviour patients.

CONCLUSION

From the perspective of clinicians, telepsychiatry is an effective way of delivering psychiatric care to urban Indigenous patients. This is due to decreased waiting time, patient feeling more comfortable at the AMS, increased compliance and adherence to care and improved continuity of care. It also frees up the GP's time as the consults are delegated to the nurse or health worker who have a closer association with the patients.

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ONLINE SELF HELP PROGRAMS FOR MEDICATION-FREE RECOVERY FROM CHRONIC ILLNESSES INCLUDING CHRONIC FATIGUE, FIBROMYALGIA, IRRITABLE BOWEL SYNDROME AND DEPRESSION.

Kim KNIGHT¹

1. Kim Knight Health, New Zealand

INNOVATION

I have developed a number of online self-help programs where patients are taught how to reduce symptoms of chronic fatigue syndrome (CFS), ME (Myalgic Encephalopathy), post viral fatigue, adrenal fatigue and fibromyalgia as well as depression, anxiety, irritable bowel syndrome and insomnia. The protocol is based on a therapy developed by a UK medical doctor, Dr David Mickel MBChB MRCP, specifically designed to clear chronic pain and fatigue conditions without medication.

CONTEXT

There are often three main challenges for patients with these chronic conditions:

1. Restricted ability to travel to appointments
2. Lack of a local therapist
3. Financial restrictions due to inability to work.

After having worked with patients for 10 years remotely via skype, I wanted to develop an online program which was accessible online 24/7 from anywhere in the world at a more cost-effective rate than private sessions.

SOLUTION

I developed several programs of different length, content and price to suit various budgets, including a free orientation series, a low-cost introductory series and a comprehensive program which includes the entire suite of Mickel Therapy exercises.

Lessons consist of pre-recorded videos, downloadable audio MP3s and pdf handouts accessible 24/7 in an easy-to-use online portal. The full program can be purchased with or without private forum support and live monthly group coaching webinars. Lifetime access is granted although the longest program can be completed in 3 months.

The benefits of an online program are:

- Lessons can be reviewed multiple times, which is beneficial for people with brain fog and poor memory
- New learnings come each time lessons are reviewed
- Members can interact with each other online, providing a supportive network when they often feel alone and misunderstood
- The overall cost is less than private consultations

IMPLEMENTATION

I spent 3 months creating and recording the main program and launched it in 2015 to my database. I run free webinars teaching people the foundation theory. Some people do a mix of private consultations with the program.

OUTCOMES

A survey in June 2016 showed symptoms reduced for the group as a whole from a mean rating of 7-10/10 to 0-5/10. An 88-year-old Australian lady, who experienced 55 years of chronic fatigue and 25 years of depression, had a 95% recovery in 6 months: before starting the program her depression rated 9-10/10 and fatigue 8/10. After 6 months her depression rated 0/10 and fatigue 2/10.

In June 2016 a 60-year-old male said "What a huge difference your course and backup has made to my life in the past six months. I have had a number of health problems over many years, including fatigue and irritable bowel syndrome, but the most debilitating symptom has been acute food intolerances which have restricted my diet severely to the point where I could tolerate very few foods at all. Mickel Therapy has given me the tools to make a huge change in my life. My quality of life has improved immeasurably. I can now eat most foods again and the fatigue has lessened greatly. I am really enjoying life again and have taken control of my own happiness and health. I sincerely thank you for all the effort you put into the program, the easy to follow videos and the support offered. I highly recommend your program to anyone who needs to improve their health and quality of life".

NEXT STEPS

To obtain help with marketing programs to increase the number of people using them which will enable me to reduce the cost, which in

turn will allow more people to use the programs, and to seek partnerships or funding to enable me to develop more programs.

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HEALTH CARE SERVICES THROUGH TELEMEDICINE TO GERIATRIC PATIENTS.

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AIM

The no. of elderly people (i.e. age >60 yrs) has reached to 10.7% of total population in India due to increase in longevity and better health facilities. Out of these 53.63% are having 1 or > 1 chronic diseases and 5 -27.3% are bed ridden among various age groups for which they have to visit hospital regularly. Visiting a hospital have become night mare for elderly due to heavy traffic on roads, over-crowded public transport and long queues in hospitals. The purpose of this plan is to stop regular personal visits to hospital and provide them Home medical care by specialist doctors by using Telemedicine.

METHODS

The telemedicine setup will be created in the hospital for elderly persons with dedicated, Doctors, Nurses, paramedical staff and IT personals. The staff will be recruited, the elderly people for telemedicine services will be decided and their health assessment will be done. Patient's health record will be maintained by EMR (Electronic Medical Record) Figure 2. The follow-up will be done by using Telemedicine, appointment for other disease emerging will be given using telemedicine and for emergency care patient will have to sms/push alarm and dedicated staff will be sent at their home. The reminder/ notification will be setup regarding their hospital visits, investigations and treatment change if any. The old people will be educated online about their disease and prevention of other diseases. They will be encouraged to for online social networks with the patients having same diseases.

RESULTS

The telemedical health care for elderly people will help in giving full medical attention by doctors, nurses and paramedical staff at their home; this will result in increased patient satisfaction and longevity. The overall impact on society will be: Personalized health care at home, 24X7 consultations by specialist doctors, continuity of care and management coordinated between family and care providers, decreased health care cost by preventing delicacy of services, unnecessary hospitalization and travel cost. This will change of attitude of general public towards elderly and will also reduce overcrowding in hospitals.

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A PROPOSED INNOVATION TO MANAGE MOBILE APPLICATION USE BY CLINICIANS IN A HOSPITAL SETTING

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3. University of Auckland Business School, New Zealand

INNOVATION

We propose a 5D matrix that rates a mobile application to provide assistance with strategic IT decisions. The matrix is used to visualize the 'value' delivered from an IT innovation such as the introduction of a mobile application to the hospital staff.

CONTEXT

The increase in the number of smartphones and wearable devices in the market have encouraged more individuals, start-ups, and health organisations to create new apps. However, some questions have been raised about data safety, patient privacy, and quality of the information provided.

This is a small pilot project that has been initiated by the Waitemata DHB research and innovation team, attempting to answer the following questions:

- What is the current and potential future role of clinical mobile apps in DHBs in New Zealand?
- What are the issues and barriers surrounding the usage of clinical mobile apps in DHBs?
- What are key recommendations to build a successful strategy for the use and management of both clinical and consumer medical apps in the WDHB setting?

SOLUTION

The creation of a mobile application questionnaire to be submitted by clinicians that reflects the value drivers of the organisation, the ease of introduction to the organisation and the consideration of patient data. This is to be reviewed, validated, and summarised by "Innovation Support Services" – a new administrative team who capture this decentralised input and develop a Strategic Technology Value Map to allow for the more appropriate decision making. Decision making is done through the creation of a new entity at the organisational executive level; inclusive of both management and clinicians. The "Information Management Steering Group" owns, governs, reviews, and decides centrally on the introduction of mobile applications. This resulting process flow is expected to be robust over time, and allow for appropriate decisions to be made in view of clinical efficiency, patient experience, and patient outcomes aligning with strategic purpose.

IMPLEMENTATION

We have constructed a five-part questioning process to demonstrate a framework the Waitemata DHB can adopt to objectively score mobile clinical apps. The process would require a clinician to fill out a questionnaire that scores and rates the clinical app being proposed for development or use. The clinician will be responsible for completing these five parts.

To begin this journey of implementing mobile applications, the very first apps introduced should not only align to existing workflows but also should solve existing problems faced by clinicians. By starting small and solving real problems, it will be easier to gain acceptance of these new technologies and the uptake will be greater. This will also build organisation capability for implementing and using this technology.

OUTCOMES

- Focus first on small opportunities that compliment current workflows
- It is necessary to comprehensively understand the workflows within departments and across departments
- Involving end users as stakeholders early on in the process will minimise this push-back
- Focusing on implementing solutions that solve real problems experienced
- Decision making needs to remain centralised, incorporating executives from across the organisation

NEXT STEPS

Next steps include reviewing and piloting the process to establish best organisational fit, and building capabilities through introduction of accepted mobile applications based on existing evidence-based practices that exist operationally or currently operate on desktops. Moreover, with accepted mobile applications, management is encouraged to allow clinicians to lead the improvement initiatives for any resulting workflow changes, or have full clinician buy-in prior to launching a central initiative.

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TO IDENTIFY MODULES OF A MOBILE BASED FOLLOW-UP SYSTEM FOR POST-INTUBATION TRACHEAL STENOSIS USING ARTIFICIAL NEURAL NETWORKS AND DECISION TREE

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AIM

Timely diagnosis of Post-intubation Tracheal stenosis (PITS) which is the worst complication of endotracheal intubation may modify its natural history. In order to prevent chronic and acute complications, the discharged ICU patients who have more than 24 hours of intubation should be actively followed-up three months later. Due to the vast number of cases in Iran, resources limitation and weak efficacy of current follow up methods, we have proposed a mobile based follow up system to both classify the cases into risky and not risky for return to clinic after ICU stay (for care provider) and determine the most important modules should be considered for developing follow-up app (for patients). This study aimed to exploit the ability of Artificial Neural Networks for classifying patients into risky and not risky cases for follow-up and the ability of decision tree for revealing the knowledge behind PITS screening app development requirements.

METHODS

In frame of a cohort study, (in 14 ICUs distributed in 10 cities in Iran; during 12 months), data of 203 intubated ICU discharged cases prepared; ten factors for PITS follow up were statistically defined ($p < 0.05$). Inputs were used to develop a feed forward multilayer perception to classify patients based on their return to clinic after discharge. The same data were used to develop a C5 decision tree in MATLAB 2010a.

RESULTS

ANN classifier developed (accuracy: 83.30%, sensitivity: 72.70%, specificity: 89.50%) and decision tree with five nodes, 13 branches, and 9 leaves producing 9 rules (75.36% accuracy).

CONCLUSION

Beside classifier to help care provider focusing on risky cases, the system may require modules including navigator to guide patients to the closest clinic, reminder for visit date, warning PITS symptoms, help old patients to find their own doctors, messaging and education based on patients age, connecting patients and their parents to care givers as well as social modules to create a strong patient community.

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BLOOD SUGAR MONITORING

Mansoor SABIR ¹

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Blood sugar level could be easily monitored without any expensive apparatus. This could be done with the help of image processing of the patient eye. The pupil of the eye is controlled by two set of muscles Sphincter and Dilator. The pupillary response of eye changes with the variation in sugar content in blood. Thus with the help of image processing we can monitor sugar content in the blood without making any harm to the patient.

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BIONIC VOICE: NATURAL SPEECH RESTORATION FOR VOICE IMPAIRED INDIVIDUALS (PILOT STUDY)

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INNOVATION

The human voice is the most magnificent instrument for communication, capable of expressing deep emotions, conveying oral history through generations, or of starting a war. However, those who suffer from aphonia (no voice) and dysphonia (voice disorders) are unable to make use of this critical form of communication. They are typically unable to project anything more than hoarse whispers.

Epidemiologic studies of the prevalence of voice disorders in the general adult population are rare. Nevertheless, information from a number of studies suggests that one third of the population have suffered from a temporary vocal impairment at some point in their life and that voice disorders can affect any age group and either sex. In some cases, vocal change is temporary however in those treated for malignant disease or with severe trauma there may be long term disturbance of phonation. This may affect occupation, social function and quality of life.

Within a speech processing framework, we have worked on a novel method to return natural voice to laryngectomised people. This method leverages on recent advances in speech synthesis to deliver a world-first technology. As a pilot study, this project has assessed the acoustic features of laryngectomised speech and has developed required enhancement for natural speech regeneration.

CONTEXT

Whispered speech is useful for quiet and private communications in daily life but becomes the primary communicative mechanism for many people experiencing voice box difficulties. Patients reduced to whispering have generally lost their pitch generation mechanism through physiological blocking of vocal cord vibrations or, in pathological cases, blocking through disease or exclusion by an operation. Typical prostheses for voice impaired patients (oesophageal speech, transoesophageal puncture (TEP), and electrolarynx devices) allow patients to regain limited speaking ability but do not generate natural sounding speech; at best their sound is monotonous or robotised. Additional drawbacks of traditional prostheses are difficulty of use and risk of infection from surgical insertion.

SOLUTION

We have taken the first steps towards the development of a non-surgical, non-invasive alternative method which combines whisper signal analysis with direct pitch insertion and formant enhancement, to reconstruct missing speech and return natural voice to laryngectomised individuals. This pilot study assesses the acoustic features of laryngectomised speech while required enhancement for natural speech regeneration is considered. Our new method implements a speech processing framework which turns the whisper-like voice samples of patients into normal speech.

IMPLEMENTATION

Audio recordings were made of five laryngectomised patients in a sound proof room reading from three randomisations of a balanced word list. Formant contours of speech samples in /hVd/ structure were analysed through combined segmentation-extraction methods. Formant characteristics were used to establish a vowel formant space for laryngectomised speech. Data was translated by spectral enhancement and pitch insertion algorithm into phonated words.

Built upon a parametric speech synthesis algorithm developed by the team, the method converts distorted vowels of laryngectomised into normal speech based on sine wave formant regeneration and artificial pitch modulation. To derive an artificial (but normal sounding) pitch pattern, this method relies upon a harmonic relationship between formant frequencies and pitch period. Then this harmonic is used for modulation of sine wave formants and modifying formant frequencies accordingly.

OUTCOMES

All audio recordings were able to be analysed. Vowel formant information was adequately produced in all samples. Frequency of the first two formants were measured and were comparable to corresponding formant frequencies in phonated speech. Reconstructed words were recognisable to naive listeners.

NEXT STEPS

As a pilot study, this project was focused on a small number of patients with very limited vocabulary size for reconstruction. We have

achieved some promising results within early steps thus, the next stages would be: a) migrating to a broader range of speech samples and patient groups, b) implementing the reconstruction algorithm on a digital signal processor unit equipped with a miniature Bluetooth microphone and speaker that can be attached to clothing.

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THE REWARDS OF INTEGRATED CARE

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INTRODUCTION

Rising chronic diseases in an aging population, in which 25 percent of individuals are more than 65 years old, were consuming 70 percent of the resources of this organization in Europe. They needed a coordinated response to improve their chronic illness programs. Immediate requirements included:

USE OF TECHNOLOGY AND/OR INFORMATION

The organization developed a solution to provide an integrated 360-degree view of patients being treated for chronic illness. The solution allows them to analyse patient records, treatment histories and key performance indicators (KPIs) to create and implement standards to optimise disease treatment in terms of both patient outcomes and costs.

IMPLEMENTATION/PROCESSES

Capabilities delivered included:

- Getting a holistic view of the patient across systems.
- Enabling the creation and management of individualised care plans to improve the care delivery process.
- Enhancing collaboration so that previously disconnected nurses, physicians, service providers, social workers and other stakeholders involved in a patient's care could communicate with one another meaningfully for the best patient outcomes.
- Introduction of an increasing number subacute services beds with less intense care as an alternative to acute conventional hospital care for CCP. These facilities are directly accessible from primary care teams.
- Gradual improvement of home care and day care facilities in the community as a good alternative to conventional hospital care, accessible to primary care professionals.

CONCLUSION

Initial results in the first 24 months:

- 8% decrease in the number of emergency admissions related to chronic conditions
- 14% decrease in the number of emergency admissions related to COPD
- 2% decrease in the number of emergency admissions related to heart failure compared to an increase of 25% from 2006 until 2011.
- The number of people with diabetes complications has been decreased 6%.

Lessons learnt:

- The real narrative of integrated care should be based on the construction of a person-centred care model where citizens could be involved in the decision process.
- The best way to involve local providers is to design and implement local Integrated Care Plans (ICPs).
- A new Shared Health and Social Care Record should be constructed to facilitate virtual work and better communication between primary, secondary and social care professionals, and new ICT platform tools should give support not only to clinicians but also to patients and citizens with improved functionality to facilitate more virtual work instead of a face-to-face approach.

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ECONOMIC EVALUATION

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To analyse whether the Barwon Health Personalized Health Care Program for COPD and/or diabetes patients is cost minimising compared to usual care from the perspective of Barwon Health. The costs of the intervention will be determined, including the cost of equipment and nursing care.

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THE ROLE OF THE VIRTUAL MEDICAL CONFERENCE

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Aim

To explore the role of the Virtual Medical Conference (VMC).

Background

Telehealth is vast and encompasses not only patient care, but also health education. Clinicians often undertake lengthy travel attending conferences for ongoing professional education. This is time-consuming, tiring, expensive and associated with jet-lag. One solution is the VMC.

Methods

The VMC can exist either as a stand-alone or in parallel with a main conference. Essential elements for success are: good internet connection, electronic media (computers, tablets and mobile phones), computing support and good central organisation. Participants (presenters, audience and sponsors) log on/off when necessary and interact via the virtual platform. Posters (with moderated sessions) are displayed in a virtual hall. Virtual booths (with tiered levels) allow for industry presence and sponsorship. Time-zone differences can be resolved with recorded sessions for subsequent viewing.

Advantages of VMC:

- cost-effective
- limitless audience size: no restrictions to space and local facilities (hotels, restaurants and transportation)
- easy organisation: no facilities booking required
- flexibility: can be incorporated to work and personal schedule, even allowing retrospective attendance
- allows seamless attendance/movement between any parallel sessions/lectures
- provides valuable analytics: delegate participation, movement and feedback accurately collated digitally
- facilitates digital networking, accelerating pipeline deals
- environmentally friendly: no travel or printouts (brochures/data-sheets)
- safe: no travel risks
- wide catchment worldwide

Disadvantages of VMC:

- inappropriate for certain conferences, especially ones requiring 'hands-on' participation
- lack of physical contact potentially off-putting
- potentially less revenue
- cyber-security and copyright-protection issues
- perceived as 'inferior'

Conclusion and Discussion

VMCs have many potential advantages. However, compared to mainstream industry, they have not taken off yet. This entire telehealth conference (for example) could be made virtual or at least have a virtual stream, in line with its philosophy. More work is required to make this concept more appealing and acceptable as a viable alternative to attending a physical medical conference.

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18 MONTHS ON FROM INTRODUCING LAPTOP COMPUTERS TO A COMMUNITY ALLIED HEALTH SERVICE - A MIXTURE OF CELEBRATIONS AND NEW CHALLENGES

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INTRODUCTION

The Child Development Service is a community, multi-disciplinary, Allied Health team for newborns-16 year olds with a disability or developmental delay. Clinicians were provided with laptops 18 months ago to improve efficiencies in working. However, processes and procedures continued to be paper-based, including referrals, scheduling, and clinical notes. Hand-written notes took on average 23 minutes to write per client; there was over-processing of information, delays in information sharing, and lack of visibility of the service in the patient's electronic health record (EHR).

USE OF TECHNOLOGY AND/OR INFORMATION

Exploration and implementation of writing clinical notes in the EHR occurred. Processes and procedures were reviewed, with changes made to reflect the DHB's 'PaperLite' guidelines; reducing waste and improving service provision. Each clinician provided with smartphone, improving communication, scheduling and documentation; and shared use of 2xiPads, enhancing patient experience through wide range of clinical apps.

IMPLEMENTATION/PROCESSES

A working group was set-up with ISG staff to explore writing into EHR. A number of solutions were considered; the process written, tested, and revised prior to presenting to the team. Training sessions and written information were provided, to ensure consistency and confidence. The service recognised need to continue moving forward with changing the way of working, and smartphones were provided in a staged process.

CONCLUSION

Data is currently being collected on time spent with patients and admin tasks, and cost savings from reduced paper-use; results will be presented in case study. Writing into EHR has improved visibility across the health system of clients accessing our service; improving patient journey through shared information with all health professionals at optimum time. However, there can be a lot of material to look through to find the needed information, due to the interface, and unable to add non-text information. As clinicians have a smartphone, and access to iPad's, laptops are taken into the community less, as most tasks can be completed on lighter device. However, as the EHR is not available on smart phone, there is compromise in accessing patient information in community. New policies have needed to be developed across services including app governance, and cleaning of devices. There has been an increase in clinicians reporting neck/arm pain from increased use of devices. Electronic processes and devices are reliant on consistent connectivity.

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DISCOVERING QUALITY METRICS FOR KNOWLEDGE QUALITY ASSESSMENT FOR CLINICAL DECISION SUPPORT SYSTEM

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Decision making is an essential activity for clinicians in the healthcare domain. Experts play an important role in decision making. However, they may make a wrong decision, because of lack of appropriate knowledge. To this end, informatics researchers have proposed many methods to use clinical knowledge using computers for the purpose of decision making. A well-known approach in this field is Clinical Decision Support System (CDSS). The CDSS improves the level of decision making by using knowledge to act on clinical data. The knowledge used in the CDSS must be both up-to-date and relevant for the cases that are being presented to it. Obviously, inappropriate knowledge can have a negative influence on decision making. Finding the latest accurate clinical knowledge is difficult since knowledge is changing rapidly and different organisations might hold it in different formats. To the best of our knowledge, the quality of proposed knowledge using CDSSs has only been considered to a minor extent. To assess knowledge quality, we need some metrics to evaluate it. This study aims to propose metrics that can be useful for knowledge quality assessment. To this end, we conducted a survey to rate and identify quality metrics.

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