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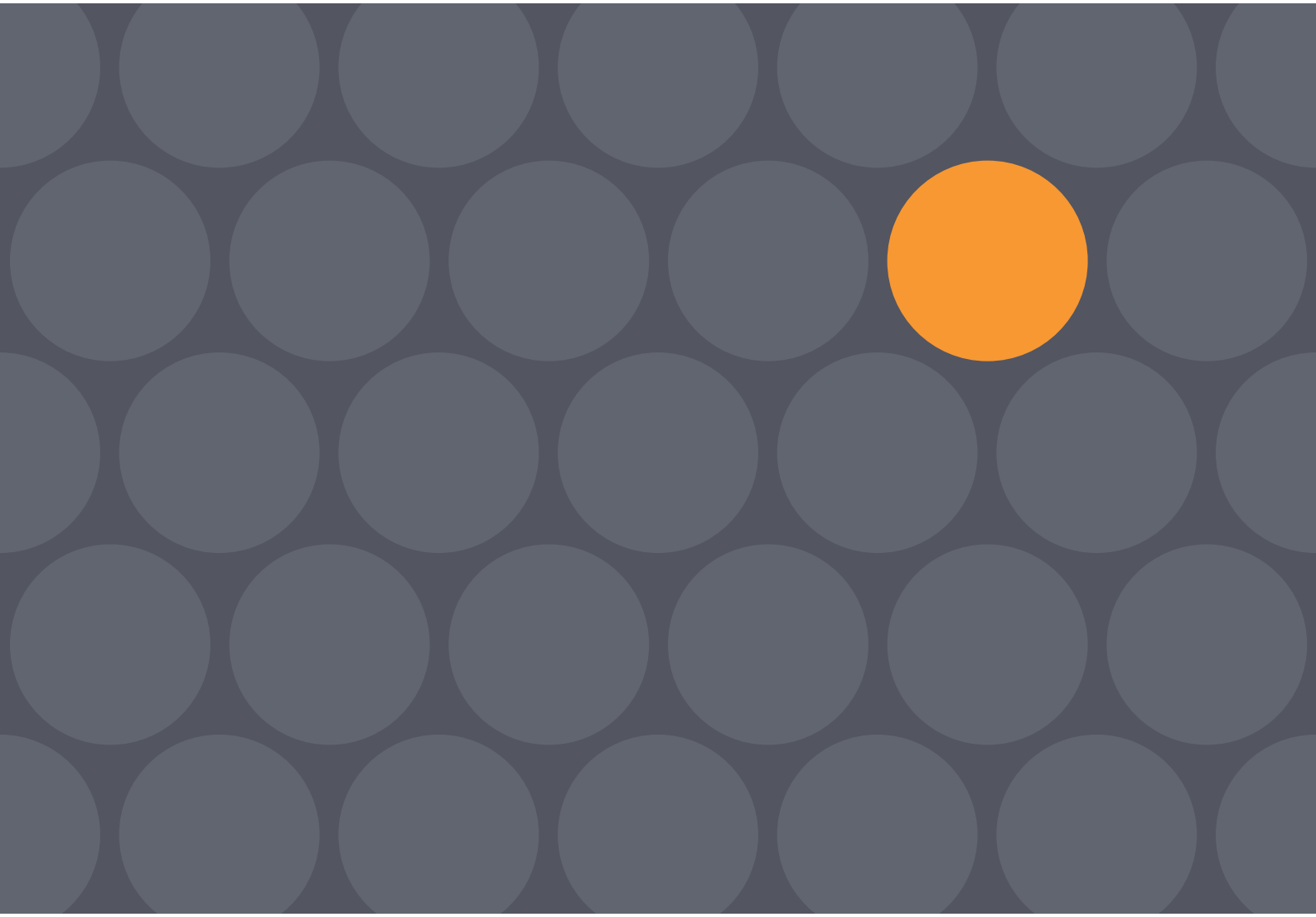

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Scientific Abstracts

ID 846 – SCIENTIFIC PAPER

A guideline for sustainable health IT implementation in healthcare organisations

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INTRODUCTION AND BACKGROUND

Evidence suggests that health IT implementations can improve the quality and safety of healthcare. But in health, we often fail. Theories have been developed to help improve the success of health IT implementation, but they do not holistically include the range of factors that influence success. Without the knowledge of core implementation components, Health Service Managers may find it difficult to manage issues arising from IT implementations.

OBJECTIVE/PURPOSE

The purpose of this research was to provide Health Service Managers with a guideline that includes core implementation constructs associated with implementation success in healthcare organisations.

METHODS

This research consisted of three components: 1) a thematic synthesis of the conceptual frameworks, theories and models to inform the development of a holistic framework for health IT implementation; 2) interviews to refine and localise the holistic framework within a New Zealand context, and; 3) to develop guidelines for health IT implementation informed by this framework.

FINDINGS/RESULTS

Five key action areas were drawn from the Broad Implementation Framework for Health Information Technology (BIFHIT) to enhance the practical use of this framework. Based on this guideline, implementers should:

1. Involve and develop positive relationships with stakeholders early within implementation processes
2. Establish and ensure a consistent vision for HIT success within your organisation
3. Consider the attributes of the HIT system
4. Ensure evaluation and feedback is iterative in its approach
5. Create a learning culture for implementation activities

Within each action area, questions are posed which aim to improve the congruence of factors that are associated with HIT implementation success. This guideline will be further elaborated in this presentation.

DISCUSSION AND CONCLUSION

This research serves as a call to action. The BIFHIT guideline presents a significant opportunity for Health Service Managers to systematically 'check' the relevant issues that may otherwise have acted as informal tacit knowledge, or worse, be overlooked. Future research should use, add to and critique this guideline to further the identification of valid factors associated with HIT implementation success.

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ID 915 – SCIENTIFIC PAPER

A Public Website for Kiwis - An Authentic Web Library of Clinical Risk Assessments, Algorithms, Tools, Calculators and Predictive Machine Learning Models

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INTRODUCTION AND BACKGROUND

Today, a huge portion of healthcare spending is directed towards advancements in healthcare delivery, sophisticated treatments, and precise and tailored care plans, thus creating a vast amount of evidence-based clinical knowledge. One major objective behind all these efforts is to provide patients and clinicians with current evidence-based knowledge for better management of healthcare delivery. Unfortunately, such information is not easily available to the general public to know/learn more about their own health, or to clinicians to keep up with new evidence-based knowledge enabling better point-of-care decisions.

OBJECTIVE/PURPOSE

We aim to deliver a public website that enables clinicians and the general public to interact with leading edge research-derived content (trained models and algorithms) and existing relevant calculators from a single and reliable source.

METHODS

This project developed a cutting-edge capability/system to ensure that risk tools, standard calculators, algorithms and trained models could be operationalised and made available in real-time to clinicians at the point-of-care. We investigated and designed the system architecture by adopting a user-centred design approach, and tested with 'Data Scientist' as-a-user including data processing, content creation, training and testing of models and providing timely access of trained models to end users.

FINDINGS/RESULTS

We successfully developed a public website for both general public and clinicians as its consumers. The underlying technology (our Machine Learning Pipeline) is fully capable to adapt trained models, standard calculators and tailored algorithms. The initial (beta version) website provides two experiences, one for the general public (the default) and one for clinicians (selectable). A secured administration application has been designed and developed for approving and revoking individual calculators as required. Integration of an early version of the Machine Learning Pipeline and related tooling for use by Researchers, Clinicians and Data Scientists for the creation and updating of new and existing calculators is also developed. Currently, the website has 23 tools and calculators deployed including the Perioperative Mortality Risk Calculator that has been trained on NZ population data.

DISCUSSION AND CONCLUSION

This project provides free and easy website access of health tools and calculators to the general public, which may result in individuals seeking treatment more promptly, as well as to clinicians enabling precise and timely care.

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ID 837 – SCIENTIFIC PAPER

An Evaluation of Perinatal Mobile Health Apps and How They Are Perceived by Women

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INTRODUCTION AND BACKGROUND

Perinatal women are motivated to learn about and engage in healthy behaviors. Mobile health applications (mHealth apps) are software programs for mobile devices created for a specific task, such as providing health information. While potentially useful, little is known about mHealth apps in general or how they could be used to support patient education.

OBJECTIVE/PURPOSE

The primary objective of this study was to inventory and evaluate available perinatal mHealth apps. The second objective was to describe the perceptions of women who used mHealth apps during pregnancy or the postpartum period.

METHODS

Google Play and the Apple App Store were searched for mHealth apps that provide pregnancy or postpartum health information. Then, apps were evaluated to determine the extent they include relevant perinatal health information. A selection of five perinatal mHealth apps were further evaluated by nine women's health professionals using the Healthcare Smartphone Evaluation Tool. The tool evaluates app content, interface design, and security. After evaluating the perinatal mHealth app marketplace, semi-structured interviews were conducted to find out about women's experiences locating and using mHealth apps during pregnancy. Data were transcribed, coded, and analyzed for themes.

FINDINGS/RESULTS

There were 505 apps located using the search term pregnancy. Of those, 424 were excluded from review because they were not in English, cost money, or did not pertain to perinatal education. After applying exclusion criteria, 81 apps were assessed. Perinatal mHealth apps were most likely to address topics related to nutrition, nausea, and fetal growth. Few apps covered contraception, preeclampsia warning signs, or postpartum depression. Expert evaluations of select mHealth apps found them to be satisfactory overall, but security was often rated as lacking.

Sixteen pregnant or postpartum women participated in the study. Most reported locating apps on their own without input from providers. Participants liked mHealth apps because the information was presented to them based on their stage of pregnancy, they could connect with others using apps, and apps could be used to record health information.

DISCUSSION AND CONCLUSION

Patients are comfortable accessing and using mHealth apps for clinical information. While many apps contain relevant information, quality mHealth apps could be difficult for patients or providers to locate. A certification system for mHealth apps may help both patients and providers identify useful mHealth apps. This study provides information about mHealth apps for a specific population. Evaluation methods used in this study could be duplicated to evaluate apps for other patient populations.

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ID 917 – SCIENTIFIC PAPER

Blockchain-based Electronic Health Records: a Review of the Opportunities and Risks

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INTRODUCTION AND BACKGROUND

Blockchain is the technology behind Bitcoin and other cryptocurrencies that have become popular in recent years, allowing for the creation of distributed ledgers that are resistant to tampering, hence one idea is to use them for electronic health records so that healthcare providers can have access to consistent, interoperable, tamper-proof patient records.

OBJECTIVE/PURPOSE

Blockchain technology has seen enthusiastic attempts to use it beyond cryptocurrency, often as if it were a holy grail presenting sure-fire opportunities to solve problems. On the other hand, detractors argue that existing solutions such as distributed databases already solve the problems that can be solved by blockchain, and that in fact blockchain may pose risks and overhead. This review seeks to sort through what has already been written, proposed, and developed in the area of blockchain-based electronic health records so as to provide a clearer picture concerning the value of such technology.

METHODS

A systematic review was conducted of the literature found through keyword searches on Google Scholar for "blockchain electronic health records", "blockchain FHIR", "blockchain HL7", and "blockchain healthcare". As blockchain is an emerging technology, the literature tended to be recent (mostly from 2016 to 2018) and published in journals and conferences that are not high-ranking.

FINDINGS/RESULTS

The literature tended to centre around designs involving the use of blockchain to log and control access to healthcare data, with the healthcare data itself hashed and encrypted but stored outside of the blockchain, possibly in a patient-designated location. Storage of healthcare data on the blockchain itself was rarely proposed. Hence, privacy, security, and data integrity were found to be pertinent opportunities for blockchain to shine. However, it was also observed that blockchain solutions themselves have had security concerns, thus it was not a silver bullet in security. Another common theme involved storing a reference to FHIR resources on the blockchain, thereby tackling the issue of interoperability.

DISCUSSION AND CONCLUSION

The interoperability provided by a blockchain-based electronic health record system may not necessarily be an improvement over non-blockchain solutions since approaches like FHIR can be used either way, and furthermore the issue of public versus permissioned blockchains require further investigation vis-à-vis government legislation and different notions of ownership of healthcare data. Although more research is needed to determine the likelihood of acceptance of the technology, and there are ethical issues to consider with respect to environmental sustainability, overall blockchain technology does present opportunities that outweigh its risks for use in electronic health records.

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ID 978 – SCIENTIFIC PAPER

Clinician and client insights into using a bedside video portal to communicate brain injury rehabilitation goals

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INTRODUCTION AND BACKGROUND

Service users often find conversations with their clinical team the most valuable resource in understanding their care—but these are virtually always limited in duration and specific piece of information may only be provided on a single occasion. These issues are amplified for clients with memory difficulties, such as after brain injury.

OBJECTIVE/PURPOSE

An in-room video portal to enhance clinician-inpatient client communication and understanding of goals during inpatient rehabilitation was developed and trialled. The portal was intended to enable clients with brain injury to independently review information to orient them to their rehabilitation goals and progress.

METHODS

After a series of co-design workshops and several iterations of an iPad app prototype, the app was trialled with six residential clients at ABI Rehabilitation over a period of several months, on an iPad mounted in each client's bedroom. This presentation will report the thematic analysis of the exit interviews that were conducted with these clients on discharge from the service and subsequently with their clinicians. Interviews with clients asked about their experiences of using or engaging with the app. Clinician interviews focused on their experiences of using the app with their clients, recording videos for use on the app and how they perceived their clients engaged with it.

FINDINGS/RESULTS

Positive feedback from clients identified the value of a system that was clearly targeted at themselves, and represented them and their own rehabilitation journey. Clarity about the portal's purpose varied, as did their perceptions of value gained. Clients provided some surprising insights regarding the way their clinicians utilised the portal. Clinician feedback was complex, including both reflections on potentially positive changes towards best practice as well as friction at the interfaces between some established clinician processes vs. ways of working that the portal's requirements promoted.

DISCUSSION AND CONCLUSION

Deployment of this video portal was intended to both integrate a new beneficial tool into practice, and implicitly to encourage certain approaches to rehabilitation goal setting considered best practice. The clinical trial and these interviews resulted in some of these intended consequences, as well as revealing a number of clinician practices, beliefs and concerns that the research team had not anticipated. These insights may provide other opportunities for the clinical team to reflect and evolve their practice.

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ID 912 – SCIENTIFIC PAPER

Clinician-centered Mobile Application Design Framework and Clinical Decision Support for Hospitals

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INTRODUCTION AND BACKGROUND

This research proposed a clinician-centred mobile application (app) design framework. It highlighted three common factors in the wider mobile health (mHealth) app domain: (1) evidence of smartphone app(s) tested/evaluated in hospitals involving senior clinicians, (2) continuous involvement of medical professionals and end-users in the app design, and (3) provision of accurate data analysis and interpretation to the medical professional via a smartphone app within a reasonable time-frame.

OBJECTIVE/PURPOSE

This research aimed to examine two areas of mHealth apps in hospitals: (a) How to provide the best user-experience for clinicians in daily routine bases and (b) how to create a clinician-centric framework for wider mHealth apps adoption in hospitals.

METHODS

The proposed framework focused on the clinician-as-a-user to be engaged and connected. Evidence shows that clinicians use an app only if they are motivated to do so. Consequently, the framework was designed with the following considerations:

- Well-documented interaction design patterns, as outlined in Fogg's model;
- Identification of the clinicians' daily needs through early engagement, clinical and design feedback; and
- Exploration of different user-engagement techniques, such as gamification and leader boards, that were tested with real-world users in a real-world context.

FINDINGS/RESULTS

We proposed a six screens (6S) framework by:

- Reviewing current mobile apps available for clinician-as-a-user in hospitals with some level of clinical decision support. Based on this review, we decided that the best number of main screens required for a successful healthcare app is six.
- Undertaking user feedback, clinical engagement and consultation to design the framework with appropriate number of screens required to capture the key information for clinicians. Initially, ten screens were selected, but after clinical consultations we optimized this to the six screens (6S) design framework.

Finally, the app framework/design was reviewed for user engagement, ease of use, and ease of adoption by a wider group consisting of eight individuals including researchers, clinicians and Health IT engineers.

DISCUSSION AND CONCLUSION

This research shows the importance of clinical engagement from the early stages of mHealth app design and development for its overall success. However, further research is required to deeply understand the effectiveness of the proposed app design framework and other mHealth apps using the 6S framework. More extensive usage and outcome data needs to be collected to enable cost/benefit analysis that would further validate this approach for developing effective mHealth apps.

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ID 857 – SCIENTIFIC PAPER

D3 Data, Decision making and Development

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INTRODUCTION AND BACKGROUND

Health data has been successfully used to describe "the problem" of persisting inequalities in health outcomes and to inform potential 'solutions'. However, increasing attention is now being paid to data utility and relevance. Whakauae Research for Māori Health and Development has secured Health Research Council funding for a three-year study to explore how routinely collected Māori specific health data, gathered at the DHB level and reported by the Ministry of Health, can be optimally used by Māori leaders and DHB leaders and decision-makers, to stimulate improvements in health outcomes for Māori.

OBJECTIVE/PURPOSE

The study will examine the processes of data identification, data analysis, and data interpretation employed by decision-makers in order to identify the most effective and promising strategies for using data to improve hauora Māori. We would like the opportunity through HiNZ to present the research and discuss early results from year one in the field.

METHODS

The study employs participatory action research (PAR) methods within a case study design. Three case study sites (Whanganui, Taranaki and Waitemata DHBs) are partners in the research. The research is conducted over four phases, in the first of these we will identify the 'case' in each DHB, i.e. a specific Māori health issue identified from routinely collected data (indicator and health service utilisation data) and considered a high priority by Māori decision-makers within the case study site. These 'cases' will then be the subject of a qualitative investigation over a further three phases. We will identify the context for the case (Phase 2); the facilitators of, and barriers to, the effective use of specific Māori health data (Phase 3); and in Phase 4, determine how findings from the study can be transformed into improvements in practice or service provision in the case study sites and more the health sector more widely.

FINDINGS/RESULTS

Phase one has exposed a number of strengths and challenges in each site with regard to the infrastructure and resources required to effectively utilise data to prioritise service provision and quality improvement. While only in the initial phase of the research (identifying the case) we have already gathered some interesting insights to share with those interested in data utility.

DISCUSSION AND CONCLUSION

We have yet to undertake the full analysis from Phase One data and cannot at this stage provide detailed findings or conclusions for the abstract but we are confident that this will be complete for the conference in November. In this time of increasing inequity in health outcomes it is important to raise with all those involved in health informatics the issue of "how we use this knowledge for problem solving and decision making".

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ID 923 – SCIENTIFIC PAPER

DataPharm: an initiative to release open data for the first time

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INTRODUCTION AND BACKGROUND

The Ministry of Health's Pharmaceutical Collection is an administrative dataset containing over a billion records of event-level data, based on claims for subsidised pharmaceuticals. It also represents a large segment of the population, with 3 in 4 New Zealanders appearing within the collection annually.

OBJECTIVE/PURPOSE

The purpose of the project was to enable open, consistent and governed access to a new health dataset, the Pharmaceutical Collection. This access would be supported by standardised analytical methods and guidance for interpreting the data presented.

METHODS

We started by investigating options, risks, and issues that needed to be resolved, and identified stakeholders. The preliminary investigation showed that we had to break into unfamiliar territory and do things differently to be able to achieve the goals of the project.

Rather than taking the classic sequential approach of gathering all the requirements before starting development work, we took a more iterative approach where we used the earlier phase to set a focus area and inform the requirements for the next phase of work. We consulted with a wider group of people at the end of each phase.

FINDINGS/RESULTS

There were six distinct phases in the project:

Phase 1 (scoping): Produced a paper to discuss options and issues with releasing pharmaceutical data and some sample data tables in MS Excel.

Phase 2 (proof-of-concept): Used Shiny (web application framework for R) to build a web-based tool as proof-of-concept with some minor adjustments to the analytical methods.

Phase 3 (methodology): Refined analytical methods used so that data presented would be easier to understand and use.

Phase 4 (user interface): Developed the user interface so that it was easier for users to navigate.

Phase 5 (design): Refined the user interface, technical documentation and user guide to ensure that the data released would be useful.

Phase 6 (review): Completed a privacy impact assessment to ensure that the data released was not confidential.

In March 2018, a beta version of the tool, DataPharm (https://www.health.govt.nz/publication/datapharm-beta), was released to the public.

DISCUSSION AND CONCLUSION

While there is always room for improvement in our quest to release useful data, a key message we received from users was that it was really exciting to see more open data from Government made available to the public. Within days of release, we saw evidence of citizen data scientists exploring the data and producing some interesting visualisations of regional variation for selected medicines.

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ID 832 – SCIENTIFIC PAPER

Disaster Healthcare Communication: Towards a National Structured Information Exchange System

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INTRODUCTION AND BACKGROUND

Disasters are globally increasing both in frequency and complexity. When a disaster occurs, the main responders are disaster management and disaster medicine agencies. In spite of their common goal of providing public health services to disaster victims, post-disaster analysis reflects poor communication and lack of information exchange across these responding agencies resulting in inappropriate and sometimes unavailable healthcare. Hence, there is an urgent need for policies and practices that establishes adequate communication and ensure that the right information is utilised at the right time.

OBJECTIVE/PURPOSE

The purpose of this paper is to discuss an approach to identify a baseline for the information requirements of responding agencies in disasters, and the possibility of creating a national structured information system restricting information exchange to minimum data sets (MDS) containing only essential data elements. The suggested system will collect multimedia data from sensors, official databases, GIS components, and could eventually use adaptive artificial intelligence algorithms to route extracted information between appropriate contacts and agencies.

METHODS

A combination of rigorous literature review and extensive semi-structured interviews with disaster mangers and disaster medicine personnel has been conducted. A number of communication challenges were revealed, and a baseline has been identified for the basic and minimal essential datasets required for disaster response.

FINDINGS/RESULTS

The key result of the study is a classification of cross-agency communication challenges into; authority and leadership, culture and trust, situation awareness, technology and legalisations. The second output is a baseline for the minimum data sets (MDS). MDS items are items that agencies have identified as crucial for disaster response and preparedness. This approach enables agencies to take control in identifying what is critical for them rather than receiving irrelative information.

DISCUSSION AND CONCLUSION

The suggested structured information system will ensure not only relevance of information but also reliability as agencies will automatically be accountable for the credibility of the data elements they provide thus ending scenarios of data discrepancies. The effectiveness of the suggested structured system depends on including the information needs of all stakeholders including non-governmental organisations, community groups, and people with special needs, to ensure proper collaboration. Neglecting the needs of these groups will result in incomplete data leading to substandard healthcare services.

Future work may consider the option of using artificial intelligence to discover further data sets that responders require during response.

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ID 865 – SCIENTIFIC PAPER

Do smartphone apps foster self-management support in people with persistent pain?

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INTRODUCTION AND BACKGROUND

Persistent non-cancer pain affects one in five New Zealanders. Current best practice for management of persistent pain involves group-based, multidisciplinary, behavioural interventions focusing on fostering self-management skills such as self-reflection and active goal setting.

However, people living with persistent pain experience a number of barriers in accessing specialist pain services in New Zealand and globally. Smartphone applications (apps) are a potential mechanism for development of self-management skills in people with persistent pain. However, the best practice content items of available pain self-management apps fostering core self-management skills and functions for self-management support is not known.

OBJECTIVE/PURPOSE

To evaluate the contents of smartphone apps for people with persistent pain facilitating self-management support and appraise the app quality.

METHODS

A systematic search was performed in the New Zealand App Store and Google Play Store. Apps were included if they were designed for people with persistent pain, provided information on pain self-management strategies and available in English. App contents were evaluated using an a priori 14-item self-management support checklist. App quality was assessed using the 23-item Mobile Apps Rating Scale (MARS).

FINDINGS/RESULTS

Of the 939 apps screened, 18 apps met inclusion criteria. Meditation and guided relaxation were the most frequently included self-management strategies. Overall, the included apps met a median of 3 (range 1-8) of the 14 functions supporting self-management. Self-monitoring of symptoms (n=10) and self-tailoring of strategies (n=8) were frequently featured functions, while few apps had features facilitating social support and communicating with clinicians. No apps provided information tailored to cultural needs of the user. The app quality mean scores using MARS ranged from 2.7 to 4.5 (out of 5.0). While use of two apps (Headspace and SuperBetter) have shown improved health outcomes, no apps have been evaluated in people with persistent pain.

DISCUSSION AND CONCLUSION

Although there are numerous pain self-management apps, the comprehensiveness of app-contents in fostering self-management support is limited. For better integration of apps in clinical practice, both users and clinicians have to be aware of such limitations and make informed choices in using and recommending apps as a self-management tool.

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ID 946 – SCIENTIFIC PAPER

End of manual auditing? Feasibility of routinely collected interRAI data for identifying inappropriate prescribing in older adults

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INTRODUCTION AND BACKGROUND

Inappropriate prescribing of medicines is prevalent and a significant cause of iatrogenic harm in older adults. Monitoring prescribing appropriateness is important to guide improvement. Existing techniques typically require manual data collection (auditing) which is too resource intensive to be sustainable outside of research settings. interRAI (international Resident Assessment Instrument) is a tool that is routinely used to assess healthcare needs for more than 50,000 older adults (>65 years old) across New Zealand (NZ) each year. Because information on patients' usual medicines is collected as part of routine data collection and can be readily and digitally extracted, it is a promising information source for continuous identification and monitoring of potentially inappropriate prescribing (PIP). No studies investigating the use of interRAI data for detecting and measuring PIP was identified. It is unclear whether using interRAI data is feasible to detect PIP.

OBJECTIVE/PURPOSE

To detect PIP in older adults using interRAI data and describe the characteristics of PIPs identified through this approach.

METHODS

A total of 78 electronic conditional (if-then) rules based on STOPP (Screening Tool of Older People's Prescriptions) and START (Screening Tool to Alert to Right Treatment) criteria, a validated tool for detecting PIP, were developed to identify when risky medicines use such as duplicate drug class prescriptions were detected. The rules were applied to interRAI assessment data collected 1 June-31 October 2016. Patient demographic details along with identified PIPs were described.

FINDINGS/RESULTS

Over the study period, 33,881 people were assessed using interRAI; 3,412 with zero medications recorded were excluded. 76 of the 114 STOPP/START rules were able to be coded at least in part. A total of 25,653 PIPs (84.2% of people assessed) were identified. PIP adults were more commonly identified in the very old, women, and those with more than five regular medicines. The most common PIP was the use of benzodiazepine (35.8%) that in older adults increases the risk for falls. Another frequently occurring PIP was the lack of anticoagulation use in people with atrial fibrillation (25.9%) which increases the risk of life-threatening blood clots.

DISCUSSION AND CONCLUSION

Electronic rules were developed to interrogate interRAI data to identify PIPs. We describe the characteristics of most PIPs identified from interRAI data and demonstrate where weaknesses in the database prevent some rules being applied. This is the first known study to use this dataset for identifying PIP. Further research is required to better understand the types of PIPs identified but it is apparent that interRAI data can feasibly be used to detect and measure PIP.

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ID 871 – SCIENTIFIC PAPER

EngageBot: an AI-system to provide health services for discharged patients

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INTRODUCTION AND BACKGROUND

There are many digital technologies that provide an environment for people to share information and knowledge, such as banking and travel industries. In the healthcare domain, these technologies are less mature, but increasingly patients are using tools for collecting and sharing their health information with their health providers. A growing body of research is suggesting that access to and sharing of information can support and empower patients in their own care as well as provide health professionals with improved information with which to plan care. In the discharge from hospital setting, perceived and real information paucity is evident. During this time, patients and their families often feel unsure about what to expect for treatment and recovery. This initial period is often cloudy for patients and families with regard to jurisdiction of care. While they might be told to contact their primary care provider if they have a problem, primary care may not yet have the patients information to help with a specific discharge question, or if they are told to ring the hospital, there is often no direct link to a person who has direct knowledge to the patient information at that time of the contact.

OBJECTIVE/PURPOSE

There is growing research that suggests this gap for patients in the transition contributes to readmissions to hospital, delays in care and subsequent delays in recovery and increased patient and family (dis)stress. While some of the questions patients might have are clinically driven, there are many questions that are related to non-clinical information such as "should I feel tired" and "when is my next appointment". The discharge process often includes much of this information, however documentation may be difficult to understand and spoken information difficult to recall. The advent of more sophisticated yet accessible technology readily available in smart phones is offering a new opportunity to support patients and families at the time and place they need it.

METHODS

We are looking to develop an intelligent system to support patients and their families to have a direct interaction and engagement to the healthcare services. The aim of this research is to work with clinicians, patients and their families to build an initial library of questions and responses and embed these in a Chatbot platform which will allow us to design a proof of concept Chatbot (EngageBot) that can be used by patients from their day of discharge and for the first week out of hospital. We will be using an automated conversational agent that has been built based on Natural Language Processing and deep machine learning techniques to manage the EngageBot through an internet-based communication paradigm.

FINDINGS/RESULTS

We will present the findings from exploratory research carried out to inform the design of EngageBot.

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ID 904 – SCIENTIFIC PAPER

Framework to assess and enhance the scalability of telehealth services in the District Health Boards of New Zealand: a research proposal.

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INTRODUCTION AND BACKGROUND

Today's healthcare industry faces a myriad of challenges, which are likely to shape the future of healthcare. These challenges include shortage in the healthcare workforce, an aging population, and an increase in non-communicable diseases. Information and Communication Technologies (ICTs) has found numerous applications, and telehealth is one of the technologies that enable faster, efficient and effective patient care to address some of these challenges. The New Zealand Telehealth Forum defined telehealth as an enabling technology to underpin the changes required in providing healthcare services across New Zealand. The District Health Boards (DHB's) stocktake in 2014 reported few telehealth technologies were implemented and there was a way to go to realize the full potential of telehealth services. A systematic review reported that 75% of initially successful telehealth projects in their pilot phase were not sustainable, and policymakers are seeking frameworks to implement, and scale up such technologies. Studies argue that there is no one-size-fits-all framework for implementing either different ICT innovations within a country/organisation or implementing a specific ICT innovation to all countries/organisations.

OBJECTIVE/PURPOSE

The study aims at developing a framework that can assist and guide the stakeholders of DHB's in enhancing the scalability of current telehealth services in New Zealand.

METHODS

An extensive review of the literature to obtain information on the relevant predictive organisational level barriers and influential factors within the scope of the study in relation to the uptake of telehealth services. A qualitative thematic analysis (Braun and Clarke 6-step guide, 2006) informs the development of the framework using the information and data from the literature review.

FINDINGS/RESULTS

The developed framework will be a theoretically robust, holistic in nature, accessible and usable in guiding the stakeholders of DHBs to implement and scale up telehealth services. It will also help to address the key challenges and the interactions between different domains in scaling up the current telehealth services.

DISCUSSION AND CONCLUSION

The concept of developing a framework and particularly one for understanding the organisational-level barriers that influence the uptake of telehealth services across DHB's is a new topic in New Zealand. The study includes quantitative and qualitative approaches to refining the developed framework applicable to the context and the needs of the DHB's systems/stakeholders in benefiting New Zealanders.

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ID 949 – SCIENTIFIC PAPER

Home is where the health is: Findings from the prototyping of a system that connects older adults to their support networks to assist ageing in place

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INTRODUCTION AND BACKGROUND

The present study is the third phase of an exploratory project which investigates how technologies that connect older adults to their support networks could assist ageing in place and enhance older adults' health and wellbeing. In the second phase of the project we conducted 41 interviews with older adults and their support networks which included older adults' friends and family members. The findings identified user-requirements including the need to customise technologies to meet older adults' changing needs. These requirements informed the development of a system that assists older adults to age in place.

OBJECTIVE/PURPOSE

The purpose of this phase of the project is to implement and refine the system in collaboration with end-users, which integrates new technologies available from existing retailers, unobtrusively monitoring older adults' activities of daily living and transfers information to their support networks via email, text messages or social media.

METHODS

Our research is influenced by a participatory action research framework, which draws from collective inquiry. Five older adults and twelve members of their support networks are currently prototyping a system which consists of a multi-sensor, smart-plug, and/or smart-lightbulb. Initial interviews were undertaken so that the systems could be customised to each older adult. During the prototyping a researcher engaged with participants through phone calls, emails, text messaging, Skype and visits. Participants completed an initial evaluation after two weeks and further evaluations are being performed at regular intervals.

FINDINGS/RESULTS

The systems were adjusted to the participants' needs during the prototyping and thus, a form of system co-design took place. The initial evaluations established additional requirements which were integrated into the system and some support network participants wanted to receive messages less frequently. The participants were generally satisfied with the systems overall and the older adults reported that their social interaction increased during the study because they discuss the study with acquaintances.

DISCUSSION AND CONCLUSION

This study indicates that new technologies could assist older adults to age in place and enhance their health and wellbeing. An unanticipated outcome was that the older adults' social interaction increased during the prototyping, which contrasts to previous concerns raised that the system could supersede interpersonal communication, although this finding is preliminary at this stage. The evaluation supported the requirements previously identified in the project, including the need for systems to be customisable, and determined additional needs that will be integrated as prototyping continues.

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ID 864 – SCIENTIFIC PAPER

How are young people's decisions about food influenced by their use of social media? A literature review

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INTRODUCTION AND BACKGROUND

If this research is considered as a tripod, then social media (SM), food, and young adults are the three legs of it with an underpinning of obesity. In the modern world, the presence of SM is undeniable, especially its prominence in the lives of young adults. Whereas system science, which addresses the issue of obesity from a holistic approach, says coincidence of many minor events can cause a large systemic effect. Food, a major determinant of obesity, represents a large range of communications and interactions on SM platforms. How do young people make decisions about food, and how does their SM usage contribute to weight gain?

OBJECTIVE/PURPOSE

The aim of the literature review was an in-depth exploration and identification of different food related communications (referred to as artefacts) on SM platforms, their probable connections with food determinants, and their relationship with obesity.

METHODS

A meta-narrative review was conducted for this literature review as it supports working with an emerging topic, and allows inputs from multiple disciplines while providing a robust process.

FINDINGS/RESULTS

From the user's point of view, two major properties of SM as a sociotechnical system include (1) duality regarding the capability of producing positive and negative outcomes and (2) how SM has a visible and a less visible side. From the critical understanding of SM through the system science lens, the connecting points between various food centric interactions are multiple across SM platforms.

Obesity research has identified excess consumption of energy in terms of food coupled with poor food choices (e.g. energy-dense nutrition-poor) as a global contributor to gain weight. The literature review presented a broader picture to identify multiple artefacts while mapping them with food determinants. Which in turn may push young adults to consume in excess while making wrong food choices. The identified artefacts include:

(1) Dealing with food related information in a SM environment

(2) SM Influencers and eating norms

(3) SM marketing, emphasising image marketing, reward systems, online food ordering influencing determinants e.g. change in attitude, food foraging

(4) SM-related depression and food

(5) Visual hunger and digital satiation covering aspects of external food cues, increased visual exposure to appetizing foods

(6) Persuasive power of interactive marketing strategies.

DISCUSSION AND CONCLUSION

The artefacts appear to influence and connect determinants for making food decisions. The next step in this research is to build a questionnaire to gauge awareness and to guide action by increasing user competency of young adults.

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ID 884 – SCIENTIFIC PAPER

How do we make them do it? Figuring out how to engage young people in digital mental health interventions.

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INTRODUCTION AND BACKGROUND

A growing body of evidence to date suggests that, when completed, digital mental health interventions are effective and safe. However, the key question remains how to make interventions engaging, particularly for hard-to-reach populations and the increasingly selective adolescent audience. HABITs (Health Advances through Behavioural Intervention Technologies) is a large New Zealand project under the umbrella of A Better Start/E Tipu e Rea National Science Challenge. Our aim is to develop a suite of digital interventions to support adolescents with common mental health concerns. The tools are linked to the HABITS platform which can collect information about usage and administer screening and outcome measures.

OBJECTIVE/PURPOSE

To discuss the strategies we have trialled to design engaging and appealing mental health interventions for young people aged 13-16 years wanting help to manage stress and mood.

METHODS

We explore various methods to design engaging interventions: rapid prototyping, co-design with the end-users, gamification, 'storyfication', modularisation of content and, finally, chat bots. Testing methods include user-testing, think-out-loud interviews and open trials to measure real-life engagement, satisfaction and efficacy.

FINDINGS/RESULTS

We will update the audience on the multiple strands of this ongoing project. In particular, we will discuss our experiences with the various methodologies and present prototype feedback from the end-users.

DISCUSSION AND CONCLUSION

The public can now access thousands of digital mental health tools (particularly smartphone apps) but there is little publicly available data on their usage and efficacy. Our concern is how to make clinically sound AND engaging tools that, particularly, the digital natives are likely to use and benefit from. Finally, there are challenges of ensuring the tools are culturally responsive to reach and appeal to a wide range of young people in Aotearoa.

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ID 823 – SCIENTIFIC PAPER

Improving Geocoding Quality in Health Research using Crowd Sourced and Open Reference Data

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INTRODUCTION AND BACKGROUND

Geocoding completeness and accuracy can be important to minimise bias in the analysis of health data. Geocoding is used to assign socio-economic deprivation scores to individuals impacting analysis and funding within health programmes. In a large retrospective primary care data set for a research study, we observed 15.6% of addresses classified as having insufficient certainty to be geocoded. Prior studies have suggested a minimum of 85% completeness is required to alleviate bias.

OBJECTIVE/PURPOSE

Our objective was to develop techniques to improve the completeness of geocoding for already collected historical address data. We were aiming to exceed a suggested minimum coverage of 85%.

METHODS

We developed two techniques designed to be used in series to improve the certainty of geocoding. These techniques consisted of exploiting longitudinal changes in the geocoding of the data and a corrective fuzzy matching geocoding process using open-crowd-sourced data as a reference frame. We used longitudinal data to identify the most certain geocodes for some address. We developed and applied a corrective geocoding algorithm using fuzzy pattern matching and phonetic and spatial comparisons to both correct and match addresses to the crowd sourced reference data.

FINDINGS/RESULTS

We improved the geocoding coverage from 84.5% to 93.6%, coding 57.7% of addresses previously too uncertain to assign a geocode to. We validated our results assessing spatial accuracy using current manually located Google Maps coordinates as a comparison.

DISCUSSION AND CONCLUSION

We were able to demonstrate an improvement in geocoding certainty beyond the suggested 85% threshold thereby reducing the risk of biasing our data. We successfully developed a corrective geocoding process by using open, crowd sourced road network data as a viable reference set.

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ID 828 – SCIENTIFIC PAPER

Information Continuity in Mental Healthcare – How does sensitive socio-cultural data travel, online and offline?

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INTRODUCTION AND BACKGROUND

Health information can be diverse, covering the gamut of biopsychosocial data. Digitisation of healthcare is creating an abundance of health information that clinicians, service managers, and consumers must make sense of, somehow. The sharing of information, promoted as one way to improve integration, is especially important in the many fragmented health systems, such as Australia's. Mental health care is one area where fragmentation and poor information continuity is of key concern. More information has been predicted to improve clinical outcomes and quality of care. Challenges arise when we consider sensitive socio-cultural information which may be relevant to someone's healthcare, but which sharing and storing may require greater nuance and humanness than we currently expect from our health information technology. This topic is of specific interest in Australia with the roll-out of the opt-out My Health Record; a national personally controlled electronic health record.

OBJECTIVE/PURPOSE

To explore current information sharing between general medical practitioners and psychologists in mental health care, and the potential impact of the My Health Record, a national personally controlled electronic health record.

METHODS

This research developed out of interviews with 12 Tasmanian general medical practitioners and mental health professionals about information sharing and digital health in mental health care. Interviews were analysed using thematic analysis. A review of the literature on electronic health records for mental health care was also undertaken.

FINDINGS/RESULTS

Clinicians revealed there was limited clarity on how to share sensitive information within their practice. For example, situations where a caseworker collects information for a GP posed challenges when this information was potentially of a sensitive nature. It appears there are tiers of sensitivity that impact information collected and shared. Clinicians had specific concerns regarding how information such as a history of trauma or certain diagnoses should be recorded and shared, on and offline. When questioned about My Health Record, clinicians raised the issue of uploading sensitive information to a permanent record. Clinicians also discussed uncertainty about the type of mental health information that may be included in the My Health Record.

DISCUSSION AND CONCLUSION

These findings corroborate previous evidence of the complexities of sharing sensitive socio-cultural health information. Sharing sensitive information poses challenges online and offline, and is potentially complicated by unclear privacy legalisation. Guidelines that cross professional disciplines are needed to guide information sharing. Further research on the role of shared decision making and consent, especially in mental health care, must be applied to electronic health records.

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ID 952 – SCIENTIFIC PAPER

Intelligent Digital Environment to Assist Elderly People: System Design and Evaluation

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INTRODUCTION AND BACKGROUND

In New Zealand, the ageing population is growing. Many older adults prefer to live independently in their own homes instead of moving into residential care. However, physical and cognitive decline associated with ageing can prevent independent living. There is need for self-care models which provide home-based services. In this work, we present a technical system architecture, which uses readily available sensors and network technologies to create an intelligent environment that provides adaptive and personalized services.

OBJECTIVE/PURPOSE

This research aims to create a low-cost and configurable intelligent digital system which can support older adults in their daily activities. To do so, the following objectives were identified:

1. Sensor technological objectives: Device and sensors need to be energy efficient, have high computational power and small in size such that they can fit in portable standalone kit.
2. Network technological objectives: Use standard communication protocols like IEEE802.11/Wi-Fi,IEEE802.15.4/Zig-Bee and Z-wave to increase the interoperability between software and hardware component of system.
3. Ethical objectives: System design must address ethical challenges like older adult's privacy, security and autonomy of the home.
4. Economic objectives: cost effective analysis is done before designing user-centric system such that this system have potential to reduce the cost to all stakeholders of the intelligent digital ecosystem.
5. Social objective: Bridge geographic distance between older adult and their support network.

METHODS

The requirements of the older adults and their support networks such as their family, friends and health providers were gathered through interviews and use to inform the design using low-cost readily available sensors and networking technologies. Prototype systems have been deployed in the homes of five older adults for evaluation. The older adults and their support networks provide feedback and new requirements through interviews.

FINDINGS/RESULTS

We present an architecture that integrates new technologies and open-source components and standards to provide a stand-alone system which unobtrusively monitors older adults' daily living, using a "plug and play" approach which is appealing to older adults who have low technical skills. A difficult aspect of the integration of standard software and hardware components was addressing the divergent needs of the older adults. However, the prototyping demonstrated that our system can be tailored to older adults' changing circumstances.

DISCUSSION AND CONCLUSION

Feedback shows that the acceptance for the system is high, both by older adults and their support networks. We also determined that older adults' requirements are evolving with time, and, therefore, our system needs to be self-configurable whereas it is currently configured by our team

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ID 898 – SCIENTIFIC PAPER

IoT-based monitoring in healthcare: Case study of falls detection and management

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INTRODUCTION AND BACKGROUND

Ageing populations all over the world in recent years has led to complex health issues, including the increase in chronic diseases and rising hospital and clinical services expenditures. IoT is promising for developing remote healthcare monitoring systems which are playing an important role in maintaining health for individuals, especially for older adults or people with chronic diseases because it can reduce hospitalization and increase quality of life.

OBJECTIVE/PURPOSE

This paper presents findings from an ongoing project which explores current IoT-based monitoring solutions in healthcare, especially solutions in falls detection and management.

METHODS

In this project, we produced a generalized IoT-based monitoring system which integrates wearable sensors and environment sensors to provide a holistic approach for remote monitoring. The approach related to monitoring, pre-assessment and post strategies. Wearable sensors are used to track and detect anomaly, while environment sensors are used to support and validate the results found by wearable sensors. The integration of detection module and validation module in monitoring systems is necessary because up to 90% of all alarms in critical care monitoring are false positives. In this project, falls detection and management is used as the case study.

FINDINGS/RESULTS

- Initial results show that the combination of wearable sensors and environment sensors supports in reducing false positives in the case study of falls detection.
- The generalized IoT-based monitoring system can be adapted to apply for multiple remote monitoring case studies.

DISCUSSION AND CONCLUSION

Sensor networks have been applying in remote health monitoring systems, however improving the performance of these systems to reduce both false negatives and false positives are the on-going challenge. There is a trade-off between false negatives and false positives. False negatives can be difficult to be totally eliminated without increasing false positives. In other hand, false positives can be very costly to manage. Therefore, in our project we would like to further existing studies by combining multiple sensors in an effect to reduce false positives.

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ID 913 – SCIENTIFIC PAPER

Measuring the Accuracy of Patients at risk of Hospital Readmission (PARR) and LACE risk scores for the New Zealand Population

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INTRODUCTION AND BACKGROUND

It is evident from the literature that current risk stratification tools lack accuracy when compared to a clinician's (clinical) judgment in identifying patients at increased risk of adverse events. Independent risk stratification tools may provide clinicians with additional information to guide clinical decision-making, but further evaluation and validation is required to provide evidence of reproducible accuracy and sufficient predictive power to provide clinicians with confidence to use the results/outcomes.

OBJECTIVE/PURPOSE

The focus of this research was to compare and evaluate the LACE Index for Readmission - Length of stay (days), Acute (emergent) admission, Charlson Comorbidity Index and number of ED visits within six months (LACE), and the New Zealand version of Patients At Risk of Hospital Readmission (PARR) using admissions data from Auckland-region hospitals.

METHODS

Data variables used included, for LACE: length of stay (days), acute admission, the Charlson Comorbidity Index which includes (age, diabetes mellitus, liver disease, solid tumor, AIDS, moderate to severe CKD, CHF, myocardial infarction, COPD, peripheral vascular disease, CVA or TIA, dementia, hemiplegia, connective tissue disease, leukemia, malignant lymphoma, peptic ulcer disease) and number of ED visits within six months. For PARR: gender, age, race (Maori, Pacific, Asian, others), cost weight of last admission, code for last submission, diagnoses for last admission, and number of acute admissions in the previous 90 days, 180 days and 2 years.

FINDINGS/RESULTS

On our New Zealand dataset, the LACE index achieved an AUC score of 0.658 in predicting 30-day readmissions. The optimal cut-off for the LACE index was a score of 7 or more with sensitivity of 0.752 and specificity of 0.564. With our data, the PARR algorithm achieved an AUC score of 0.628 in predicting 30-day readmissions. The optimal cut-off for PARR index was a score of 0.34 or more with sensitivity of 0.714 and specificity of 0.542.

DISCUSSION AND CONCLUSION

This study shows how ineffective the two models for risk of hospital readmission (LACE and PARR) are when applied to the New Zealand population and local context. Further research is required to measure their full impact on admissions and overall clinical acceptance. This also highlights that there is a high need for risk prediction and risk adjustment models to become more accurate, and to be utilised in hospitals for incentives or penalties.

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ID 835 – SCIENTIFIC PAPER

Mobile technology can assist in paediatric resuscitation

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INTRODUCTION AND BACKGROUND

In paediatric resuscitation every second counts. Providing lifesaving treatment for children requires an accurate weight to calculate drug doses and equipment size. Measuring weight when a child cannot be moved leads to weight estimation. Current methods of weight estimation are inaccurate and designed for non-NZ populations. Furthermore, an inaccurate weight can affect the child's survival or quality of life.

OBJECTIVE/PURPOSE

To reduce the chance of error during paediatric resuscitation by automating the weight estimation process using mobile technology. This will be achieved through the development of a mobile application to accurately estimate the weight of a child during resuscitation tailored to the demographics of New Zealand children.

METHODS

A design science approach adapted from the work of Hevner and Ilvari was utilised for software design. Accuracy and tailoring to the New Zealand population were achieved by regression modelling a large data set provided by Statistics New Zealand. Currently, user testing and completion of this is planned for August 2018. Testing uses a survey based on the Technology Acceptance Model, direct observation of use and the "think aloud" technique. While accuracy will be tested by measuring a cross-section of NZ children.

FINDINGS/RESULTS

An application to measure a child has been developed using augmented reality to ensure adaptability within the environment. Weight is predicted based on height/length of the child with variables such as age, ethnicity and gender augmenting this to produce more accurate estimates. The accuracy of length is between ± 1.6 cm on measuring length in optimal conditions by an experienced user. Further results will be included after user testing is complete.

DISCUSSION AND CONCLUSION

The Weight estimation without waiting (WEWW) application has been developed using design science research processes to ensure robust and rigorous design. Development of this application aligns with the NZ Health Strategy 2016 by taking advantage of new and emerging technology and with use of large datasets to provide reliable and accurate information available at point of care. It also promotes improvement the health of individual people and their communities through providing a mobile application designed to reduce error and provide accurate estimate weight estimates for children undergoing resuscitation. It is anticipated that this application will provide quality, safe patient care supported by evidence and deliver smart, streamlined health care to children undergoing resuscitation.

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ID 858 – SCIENTIFIC PAPER

Patients informing the next generation of mHealth Interventions

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INTRODUCTION AND BACKGROUND

It is well established that end-user engagement is critical to the success of health interventions and mHealth tools are no different. The National Institute for Health Innovation (NIHI) has been designing, developing, testing and delivering consumer mHealth interventions for over 15 years. Over that time, our processes for end-user (consumer) input into design and development have evolved playing a vital role throughout the process. With our latest developments, we are also evolving the technologies involved.

OBJECTIVE/PURPOSE

We describe the design and development of a next generation mHealth intervention that weaves new technology tools, devices and computational methodologies into an adaptive mHealth intervention in order to be more individually tailored and more responsive to the user and their needs over time. We will use the example of our mPR (mobile Pulmonary Rehabilitation) programme, which is a collaboration with a broad team of multidisciplinary clinicians and academics.

METHODS

Consumer, caregiver and clinician input into the design and development of this new programme has been key. We have built on co-design methods utilised in previous programmes such as the OI@Or@ app co-designed with Maori and Pacific communities, and the SPGeTTI app with groups experiencing gambling harms. Processes used include surveys, interviews, participation on design groups/workshops, and pre-testing of various components in an active and iterative process to enable rapid yet robust development. Throughout the development, input from end-users is prioritised.

FINDINGS/RESULTS

End-users are able to identify what the main issues are that can be addressed with mHealth programmes. Our populations tend to want very comprehensive programmes, to the point of designing in too much complexity. Our previous programmes have shown that consumers value the support and motivational aspects highly. Our efforts to tailor and personalise programmes to their culture, needs, and motivations have been appreciated by participants. Behaviour change constructs that we use are represented in participant feedback also.

DISCUSSION AND CONCLUSION

It is vitally important to enable patients to play a lead role in the design of the next generation of mHealth interventions if they are to be useful, engaging and effective. We are constantly learning and evolving our methods for participant involvement in design and development and as a consequence constantly exploring how new technologies can be embedded into evidence based mHealth interventions.

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ID 916 – SCIENTIFIC PAPER

Predicting Hospital Admission Risk Using Primary and Secondary Data Sources

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INTRODUCTION AND BACKGROUND

Currently, an individual's health record (data) is stored in two main silos i.e. primary care and secondary care databases. If this data were to complement each other, it could open up possibilities to create effective and accurate predictive models. To achieve this we collaborated with multiple health IT partners in New Zealand including DHBs to create a health data pool (HDP) which is primarily the data store of primary health care records and hospital admissions data from secondary care. The establishment of a concept like HDP would be a significant achievement for a country like New Zealand, as it builds integration among disparate systems across health sectors, which might enhance the health sector abilities to develop future precision health models. Integrating, merging, and querying primary and secondary care data profiles can enable clinicians to 1) view an end-to-end patient record and assist in making informed decisions and 2) develop precision health models to aid predictive and preventative health goals. To instantiate the use of HDP we developed a predictive model – Hospital Admission Risk Predictor (HARP).

OBJECTIVE/PURPOSE

The key idea of the HARP is to calculate the probability a person will be admitted into the secondary care (Hospital) and take early action to avoid the admission.

METHODS

We adopted the logistic regression modelling approach for HARP predictions. For testing and verification of HARP data of 50,000 patients have been collected/extracted from Whanganui DHB and Whanganui Regional Health Network (PHO). The project demonstrates key interfaces for data acquisition, prediction model development and distribution of risk information to users as responses to single queries or batches.

FINDINGS/RESULTS

To select a set of patients for potential intervention to avoid admission we selected a 50% "cut-off" probability. This is best done in discussion with stakeholders, taken account of the relative costs and benefit associated with true and false positives. Assuming, 50% as our cut-off probability, the model returned 27 true positives and 40 false positives. If we plot these set of points: x false positives (1 – Specificity) versus y true positives (sensitivity) for all predictions we can plot a gives the Receiver Operating Characteristic (ROC) curve. The Area Under the Curve (c-statistic) for the model was 0.71.

DISCUSSION AND CONCLUSION

Enabling a sophisticated HDP data infrastructure can revolutionise the ability of informed decision making and widen up the opportunities of predictive modelling for preventative health outcomes, utilizing the primary as well as secondary care records. The project is being further validated by analysing data snapshots over-time to check the accuracy of the HARP prediction. The next steps would be to provide recommendation on the cut-off probability as it could vary based on medical conditions and contexts.

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ID 848 – SCIENTIFIC PAPER

Processing natural clinical narrative in general practice to classify a spectrum of child respiratory conditions across a large longitudinal data set.

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INTRODUCTION AND BACKGROUND

General Practice in New Zealand has been almost ubiquitously computerised for a decade. Clinician entered clinical narrative offers a rich source of data that may not otherwise be coded. Because respiratory illness is acute it less likely to be coded consistently by clinicians. In this study, we set out to classify child respiratory presentations in seven categories using clinical narrative supplemented by prescribing data and clinical coding.

OBJECTIVE/PURPOSE

Our objective was to classify child respiratory presentations in seven categories to support a wider study to understand the presentation of child respiratory illness to general practice over 77,582 children and 650,000 consultation records. When compared to expert-clinician review, we aimed to achieve measures of accuracy that would facilitate further quantitative analysis of the data.

METHODS

We identifying an appropriate lexicon and clinical rules and precedence. We sampled 3600 consultation records for children over a 5 year period. All samples were independently reviewed and coded by expert clinicians. The manually coded records were separated into three sets of 1200 records each. The software algorithm was based on the clinical algorithm and trained against the training data set. Modifications were made based on the training data set using both technician adjustments to the lexicon and clinical rules with a genetic algorithm being used to fine-tune the parameters of the natural language engine. Fitness of the parameters was determined through measures of accuracy of the output compared to the clinician coded records.

FINDINGS/RESULTS

The software algorithm in its final configuration was tested once against the test records. The records in the test set were taken from practices and clinicians not used in the training or validation records to avoid a training bias. Sensitivity, specificity, positive predictive value, negative predictive value and F-measure with 95% confidence intervals were used to describe the accuracy of the algorithm compared with clinical experts. The best performing classification was wheeze illness, with an F-measure of 0.81. Throat infections had the highest positive predictive value of 0.91. Overall the algorithm could classify all-respiratory illness in children with an F-measure of 0.81 and positive predictive value of 0.93. 46% of child-general practitioner consultations were for respiratory conditions. We were able to demonstrate stable seasonal patterns. URTI conditions were the most common, consisting of 21.0% of consultations.

DISCUSSION AND CONCLUSION

We demonstrated excellent performance of natural language processing to classify clinical narrative into six respiratory conditions. We previously demonstrated this technique to classifying influenza like illness. This represented an additional challenge beyond a basic binary classification. This technique provides a viable option to retrospectively classify clinician coded clinical narrative across large sets of data for a range of conditions.

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ID 905 – SCIENTIFIC PAPER

Scalability of Multiple Imputation of Missing Health Data

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INTRODUCTION AND BACKGROUND

Missing data or incomplete data is a common issue faced in the Health sector. Imputation increases the amount of data available for use. At present, many observations in health datasets used for research or clinical decisions are discarded because of missing data points. We look at techniques that would allow these observations to be utilized by imputing the missing data points with an acceptable degree of accuracy. This research has the potential to significantly improve the efficacy or worth of some incomplete data sets by allowing new complete datasets to be produced synthetically, unlocking potential trapped in incomplete datasets. This could facilitate better decision making and analysis, which in turn may significantly improve health outcomes while reducing health expenditures. To test the scalability of the imputation, three methods were compared both for accuracy and performance.

OBJECTIVE/PURPOSE

The purpose of the research is to evaluate the scalability of different multiple imputation techniques used to infer missing health data. The techniques will be used to determine whether it is possible to improve the quality of data for use in research and potentially clinical decision making. The output of this research is twofold. Firstly, there will be techniques to build software that sits before other predictive algorithms to provide more data from which to predict. The second is the availability of more data when making decisions about a population where exactness is not the priority. There is no intention for these techniques to be used for the completing of data for a specific individual.

METHODS

Three methods of data imputation are being investigated. These methods are chained equations using the R MICE package, random forests using the R MissForest package and artificial neural networks using the Python MIDAS library. These methods will be tested using synthetic data, where we take complete data and artificially make holes in the data. Comparison will be made as to how close the imputed data is to the actual data when different amounts of data are missing.

FINDINGS/RESULTS

The findings and results of this research are due by the end of September 2018.

DISCUSSION AND CONCLUSION

Currently we have sourced our datasets and are evaluating various multiple imputation strategies. The next phase will be to design scenarios that will be used to thoroughly evaluate the chosen approaches. It is expected that the bulk of our research will be completed by September.

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ID 935 – SCIENTIFIC PAPER

SeNZ - a novel device to improve hand hygeine

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INTRODUCTION AND BACKGROUND

Poor handwashing practice in hospitals is linked to healthcare associated infections, which affect 1 in 25 patients. The World Health Organization estimates that these infections are responsible for financial losses on the order of tens of billions of dollars and that complications arising from these infections lead to millions of deaths annually. At least twenty seconds of handwashing is well recognised as the internationally accepted best practise, but is frequently not achieved. The demand for innovation that will enourage better adherence to this important standard is compelling.

The device has been developed under the Waitemata DHB Engineers in Clinical residency programme involving University of Auckland Engineering faculty and Waitemata DHB staff.

OBJECTIVE/PURPOSE

This talk will discuss the design and prototyping of a device to enable anonymous and autonomous recording of hand washing duration in a hospital environment with data-logging capability. The results of initial trials of the device showed that handwashing duration was reliably recorded to within <0.1 second accuracy. Potential development of this platform, in the form of behaviour-dependent interventions, will also be discussed.

METHODS

Initial Validation trial was done comaring video analysis (Gold Standard) and device timing.

FINDINGS/RESULTS

A inter observer reliability score of 0.91 was found- thus 'excellent inter rater reliability' between the device and the gold standard.

DISCUSSION AND CONCLUSION

The SeNZ device is a novel device designed to improve hand hygiene. Thus far it has been shown to be reliable in measuring hand washing duration.

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ID 961 – SCIENTIFIC PAPER

Smart MedRec: Using Indirect Data Labelling for Machine Learning

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INTRODUCTION AND BACKGROUND

Dosage instruction data are typically unstructured and unsuitable for key processes such as analytics and automating medicines reconciliation. Machine learning (ML) has been used in other domains to automate the conversion from unstructured data to structured information. To use supervised ML in this context requires a large training dataset with unstructured dose instructions and their corresponding structure (i.e. labels) but this is currently unavailable. Direct manual labelling is prohibitively resource intensive, and an alternative method of producing a suitable training data set is sought.

OBJECTIVE/PURPOSE

The objective is to produce a training dataset that is suitable for ML by significantly automating labelling of dose instructions while requiring only a relatively small amount of manual labelling of "tokenised forms" of dose instructions.

METHODS

The data used was 1 million randomly selected rows (out of a total of 7.1 million available data rows) of de-identified dose instructions from the electronic medicines reconciliation (eMedRec) system at Waitemata District Health Board from the system's start until data extraction in 2017. The structured dose form was defined based on the HL7 FHIR v3 Dosage resource, refined to fit the needs of a real-world software system for medication reconciliation. Pharmacy staff manually labelled a random sample of n=1,900 dose instructions. This was analysed to enable the development of a more efficient indirect labelling system: Firstly, dose instructions are tokenised, where certain components of a dose instruction are replaced with a token. This has the advantage of enabling the grouping of similarly worded dose instructions. For example, "take 3 tablets nocte" and "take 5mls in the morning" share the same underlying pattern which consists of 1) number, 2) unit and 3) time of day. Both can be tokenised as "take (NN) (D_UNITS) (AT_TIMEOFDAY)". Secondly, a subset of the most commonly occurring tokenised forms are manually labelled, maximising coverage. This provides a "mapping" for each distinct tokenised form, i.e. how specific components in the given dose instruction relate to the structured representation's components. Finally, the original dose instruction data is automatically labelled by tokenising each dose instruction, finding the matching tokenised form in the labelled tokens, and applying the corresponding mapping.

FINDINGS/RESULTS

100 labelled tokenised forms equates with indirect labelling of over 600,000 rows of dosing instructions (i.e. over 60% of the random sample). Pharmacy staff report that labelling tokenised forms is less intuitive and familiar than direct labelling. Anecdotal evidence suggests that it takes approximately 2-5 times longer to label each tokenised form. However, each labelled tokenised form allowed the automated labelling of an average of 6,379 rows of dosing instructions at a time.

DISCUSSION AND CONCLUSION

Tokenising unstructured dosing instructions for indirect labelling can be feasibly applied to produce a large and labelled training dataset of medicines-related dose instructions for ML.

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ID 897 – SCIENTIFIC PAPER

Technology-Driven Medication Management: A Vision through the Lens of New Zealand Experts

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INTRODUCTION AND BACKGROUND

Medication adherence (MA) refers to whether patients take their medication as prescribed, also known as avoiding any sufficient deviation from the prescribed medication regimen that poorly influences the regimen's intended effect. Interventions to improve MA varied in previous research. A number of them focused on patient education, patient-clinician communication, and patients' beliefs on prescribed medication, which repeatedly associated with outcomes such as patient adherence, satisfaction, and more progressive health outcomes. The most recent ubiquitous interventions were mobile applications (app), which are increasingly used by patients for managing their medication intake.

OBJECTIVE/PURPOSE

The objective of this study is to explore the perceptions of healthcare experts and health system designers, on the features an MA app could include, which will benefit patients and healthcare team alike. Then, propose a wireframe based on the highly recommended features. After that, evaluate the wireframe by experts in the field.

METHODS

We conducted an online questionnaire consisting of 8 questions. The data were analysed using descriptive statistic, and thematic analysis then quantified to address our objective. The questionnaire invitation was emailed to experts through LinkedIn following a purposeful sampling technique and circulated via HINZ newsletter, which was a success factor in obtaining a wider involvement. We also proposed a wireframe, which was evaluated by 7 participants from a multidisciplinary background, a subset of the questionnaire participants.

FINDINGS/RESULTS

A total of 240 participants finished the questionnaire. The majority of 52.5% were from Auckland, 13.8% from Wellington, 10.7% from Waikato, and 23% from other regions include; Bay of Plenty, Canterbury, Hawke's Bay, Southland, Northland, Otago, West Coast and, Manawatu-Maunganui. We were able to attract participation from most main regions. A total of 62.6% agreed on reminding the patients to take their medication, 75.3% considered diet and daily activities affects medication adherence and 77% answered "yes" when asked if they think two-way communication between patient and health provider will improve MA. Furthermore, the suggested essential elements in an MA app were "Educational Content" with (95) times occurrence, "Communication" (41) and "Acknowledgment" (32). As a result, we suggested a wireframe based on the highly recommended features. The participants gave a good initial feedback on the app, for example: "wireframe seems great and I feel if we were to introduce such thing into New Zealand, we could greatly improve medicine compliance".

DISCUSSION AND CONCLUSION

Our findings suggest that patients need reminders for their medication intake which is supported by an earlier systematic review of the effectiveness of interventions using electronic reminders to improve medication adherence. Moreover, results demonstrate that receiving an acknowledgement of patients medication intake, is highly recommended by experts from a multidisciplinary background, as a future insight on an MA app that can be implemented in the health system.

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ID 807 – SCIENTIFIC PAPER

Telehealth: Rethinking health literacy and engagement with Māori mothers

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INTRODUCTION AND BACKGROUND

In New Zealand, barriers to accessing perinatal health services remain a significant problem, especially for Māori and rural populations. However, information technologies and telehealth can facilitate the distribution of health-related information and promote provider engagement during the perinatal period.

OBJECTIVE/PURPOSE

This study explored the perceptions and use of technologies of women and their partners who were pregnant or new mothers and utilised Kaupapa Māori perinatal health services. The study was conducted to inform a business case investment for a District Health Board's maternal services.

METHODS

A Kaupapa Māori consistent methodology was applied in this study. This approach centralises Māori paradigms, language and values and ensures that research is owned by and benefits Māori. Semi-structured conversational interviews were conducted with a total of nine Northland-residing participants (four Māori and five non-Māori). These were conducted with attendees at a Kaupapa Māori antenatal program. Data was analysed thematically.

FINDINGS/RESULTS

Four overarching themes emerged from the narratives: communication, information, facilitators and barriers. Participants reported using a range of online tools, often simultaneously, to access diverse topics of health-related information and facilitate self-governance in applying information. The credibility and reputability of the sources providing information and knowledge sharing were important to participants. Similar technologies were used to communicate with healthcare providers and to facilitate in-person appointments. Barriers were related to the technology or the experience of using it, whilst access and emotional elements facilitated engagement. Participants were satisfied with the technologies they had chosen to use.

DISCUSSION AND CONCLUSION

This research suggests that information technologies play an important role in health literacy and minimising barriers to perinatal healthcare, by facilitating the distribution of health-related information and promoting provider engagement. It infers that the available online tools and services in Northland appear to be adequate for the population served. In order to further promote engagement between perinatal healthcare providers and service users, perinatal healthcare providers should leverage the existing tools and services and upskill to assist their service users in selecting high quality online services and resources.

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ID 890 – SCIENTIFIC PAPER

The potential of mobile health — reducing health inequalities

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INTRODUCTION AND BACKGROUND

The potential benefits of mobile health (mHealth) programmes to deliver support and information are broad. These benefits are not necessarily based on the size of the effect, but the breadth and depth of their reach into populations who need the greatest support, who are more likely to be in the lower socioeconomic quintiles, with worse health statistics, and have been traditionally underserved by existing health services. Keeping one eye on the ethical complexities of technological developments is essential to ensuring that the globalisation of mobile technology for health reflects the diversity of the audience it serves, and most importantly, does not increase inequalities. Our team develops programmes using text messaging as the most accessible technology across all populations. However, questions about the ethics and equity remain in the design process. Fundamental to our work has been the prioritisation of populations most in need, co-design methods, and cultural adaptation.

OBJECTIVE/PURPOSE

The purpose of this presentation is to discuss the potential of mHealth to reach populations most in need as well as the complexities of advancing mHealth in light of this. We will draw on examples of mHealth programmes developed by our team targeting specific population groups: a diabetes self-management support programme for people with poorly controlled diabetes, particularly Maori; a culturally tailored maternal health programme for ethnic minority groups in Auckland; a co-design process for a wellness app with Maori and Pacific communities; and a smoking cessation programme adapted from New Zealand for people in Samoa. We will ask questions around the appropriateness and ethics of these processes, which adapt language and cultural nuances to reflect the setting and populations they serve. But are they the best we can do?

DISCUSSION AND CONCLUSION

The potential of mHealth programmes rests on the ubiquity of mobile phones—New Zealand has more mobile phone subscriptions than people. This makes them an ideal way to deliver health information, promotion, and support to those who aren't able to access these things in other ways. But it is essential that mHealth interventions are designed specifically with, and for, priority populations and that researchers design evaluations to measure both the reach into these groups and the impact on those who need the most support. We would like to see more research studies and programme evaluations measure their reach into underserved populations. In this way, we can develop a true picture of the benefits of technology-assisted health interventions.

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ID 945 – SCIENTIFIC PAPER

Use Cases for Artificial Intelligence in Dermatology

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INTRODUCTION AND BACKGROUND

Over the last 20 years MoleMap has operated a tele-dermatology program for the early detection of melanoma. As part of this program we have recorded some 16 million lesion images and some 1 million of these have been categorised by dermatologists. This data has been consented by patients. This rich source of data is extremely valuable in the development of Artificial Intelligence (AI) algorithms that could be applied in Primary Care or to improve tele-dermatology diagnosis.

OBJECTIVE/PURPOSE

The use of AI in a medical setting requires careful consideration of what purpose it aims to serve. We have tested the developed AI algorithm in a number of simulated settings to determine what uses cases may be achievable given the inherent challenges associated with a cancer diagnosis from not-always-perfect data.

METHODS

A deep learning based algorithm was trained on 78184 lesion images to detect skin cancers with the objective of providing primary care physicians (PCP) with management guidance. This algorithm was applied on 19416 lesion images for automated triage of 25 skin diseases and compared with the diagnostic assessment of a group of experienced tele-dermatologists. A separate image set comprised of histologically proven lesions was used to test the absolute accuracy.

FINDINGS/RESULTS

The algorithm diagnostic concurred with the tele-dermatologist diagnosis at rates of 66.7% for its highest ranking, 82.9% for its top-2 ranking and 89.7% for its top-3 ranking. For binary decisions – "cancer versus benign" the algorithm yields specificity, sensitivity and AUC scores of 84.4%, 76.2% and 0.89 respectively. For "melanoma versus benign", which was considered as a proxy task to assist a PCP, application of the algorithm yielded 85.9%, 82.6% and AUC 0.91 respectively.

DISCUSSION AND CONCLUSION

To test the utility of this AI algorithm we explore several uses cases with the aim of improving the effectiveness and efficiency of skin cancer screening:

1. As a triage system that can be used by non-specialist clinicians to assist with the selection of lesions that may have a high risk of skin cancer. The AI algorithm produces a score indicating the percentage likelihood that a lesion is a skin cancer and then indicates a percentage score for each of 25 different categories. The combination of these two methods provides the clinician with information enabling them to discard lesions that are non-suggestive of skin cancer and present only lesions of high suspicion to the tele-dermatologist for diagnosis.

2. The second use case is an overread service to augment the decision making by the tele-dermatologist. Using the scores from the AI algorithm the service alerts the tele-dermatologist when a lesion marked as no concern exceeds a threshold.

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ID 873 – SCIENTIFIC PAPER

Using machine learning to improve surgical risk prediction in high-risk subspecialty patient cohorts in New Zealand

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INTRODUCTION AND BACKGROUND

Surgery is about understanding the risks and rewards of different operations, as all operations will have some inherent risk. Understanding this risk is important for clinicains and patients alike as they decide whether or not to proceed with an operation. Many surgical operations carry similar levels of risk but some surgical subspecialties, such as neurosurgery, have elements which can lead to them being riskier than the "average" surgery. For this reason, generalised tools can sometimes fall short of their goal of accurately categorising risk for patients having operations within higher-risk specialties.

OBJECTIVE/PURPOSE

Our objective is to provide accurate and well-calibrated risk tools for use by clinicians working with NZ patients who are undergoing surgery. Previously we developed NZRISK, a generalised, accurate and well calibrated tool for assessing surgical risk in NZ patients. This work is an extension of that tool.

When looking at the performance of NZRISK we noticed that in four of sixteen subspecialties (neurosurgery, thoracic, gastro-intestinal and vascular surgery) risk was being underassessed. Therefore, we are developing higher accuracy subspecialty calculators through further clinical consultation and more advanced modelling practices..

METHODS

Firstly, by talking with neurosurgery clinicians we identified new, neurosurgery specific covariates in our data set. We then investigated combinations of covariates which would improve the logistic regression model, finally we have used random forest modelling to asses if it can improve the model further. We intend to undertake the same steps for our other specialties of interest.

FINDINGS/RESULTS

Preliminary results using new covariates and logistic regression showed improvement at predicting neurosurgical outcomes. We expect further improvements once we implement more advanced modelling techniques in conjunction with the neurosurgery specific covariates. We also expect quick improvements within other high-risk specialties after finishing our exploratory work and establishing our processes with neurosurgical data.

DISCUSSION AND CONCLUSION

Using a large, unbiased, New Zealand patient cohort we have been able to build an accurate, targeted risk assessment tool for neurosurgical patients in NZ, building on the success of NZRISK. Through a combination of clinical consultation and improved modelling we have imporved predictions for specialist patients. As far as we are aware, we have built one of the first neurosurgery-specific risk calculators as well as building one of the most accurate risk assessment tools for NZ surgical patients. We plan to extend this work into multiple other surgical subspecialties.

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ID 891 – SCIENTIFIC PAPER

Validating a predictive model for breast cancer survival in different ethnic groups in New Zealand

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INTRODUCTION AND BACKGROUND

We had developed a predictive model for 10-year survival in women with breast cancer in New Zealand, using the data from the Auckland Breast Cancer Registry covering the period from 2000 to 2014. We used a Cox regression model and included age, ethnicity, tumour size, grade, number of positive lymph nodes, tumour stage, ER and PR receptors, HER2 status, and histology of tumour as predictors.

The model had good overall validity (c-statistics=0.84), and reasonably good calibration.

OBJECTIVE/PURPOSE

To assess the performance of the predictive model in different ethnic groups.

METHODS

We used the combined database from the Auckland and Waikato registries covering the period from 2000 to 2014. We evaluated the model's calibration in each of the four ethnic groups (Māori, Pacific, NZ European and others) by comparing predicted probabilities of 10 years breast cancer specific survival against observed probabilities in ten risk groups of patients defined by the decile of predicted survival.

FINDINGS/RESULTS

There were 1108 Māori (with 127 breast cancer deaths), 725 Pacific (with 92 breast cancer deaths), 8658 NZ European (with 846 breast cancer deaths), and 1316 patients of other ethnicity (with 81 breast cancer deaths). From the highest to the lowest risk groups, predicted survival probabilities ranged from 0.34 to 0.99 for Māori, from 0.29 to 0.99 for Pacific, from 0.28 to 0.99 for NZ European, and from 0.58 to 0.99 for other ethnic group. Predicted survival probabilities were within 95% CI of observed survival probabilities for Māori and Pacific patients and those of other ethnicity in each database. This was also true for NZ European patients, except that predicted survival probability in the highest risk group was lower than the lower confidence limit of observed survival probability

DISCUSSION AND CONCLUSION

The model has reasonably good calibration when applied in Māori, Pacific, NZ European and other ethnic groups in New Zealand. We plan to further improve the model performance through exploring other predictors or assessing statistical functions of the existing predictors. We will then explore potential clinical applications.

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ID 881 – SCIENTIFIC PAPER

Value Added by Applying Multiple Imputation to Health Datasets

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INTRODUCTION AND BACKGROUND

A common issue with health data collected from patients is that it is often rife with missing values. Often, affected records are omitted from the decision-making process and any downstream analytics. This translates to a potential loss of information, which in some instances, may result in compromised quality of care and increased costs.

Multiple imputation is a statistical technique for handling missing data in multivariate analysis. It has been demonstrated that, if pre-requisite conditions are met, the inferences made by multiple imputation are unbiased and statistically valid. It is envisaged that multiple imputation has the potential to improve the information available from datasets that have issues with missing values and thus improve the predictive performance of downstream models and ultimately improve health outcomes.

OBJECTIVE/PURPOSE

The objective of our research is to evaluate current multiple imputation approaches and their effectiveness in imputing missing health data. We look at several scenarios and investigate whether there is any significant improvement in the predictive performance of various models after they have been trained on datasets that have had their missing values imputed. This will determine whether the time, complexity and costs involved with multiple imputation is aligned with the benefit gained.

METHODS

We look at three imputation packages: MiCE (r package based on chained equations), MissForest (based on random forests machine learning algorithm) and MiDAS (Python library based on deep learning and artificial neural networks).

We evaluate the methods over a range of scenarios and compare the performance of models trained using imputed data against those using only complete data (e.g. patient mortality prediction and surgical risk calculator). The datasets used include the "MIMIC III" dataset, a publicly available dataset of 40,000 critical care patients, from Beth Israel Deaconess Medical Centre and a subset of the National Minimum Dataset, a collection of public and private hospital administrative information managed by the MoH.

FINDINGS/RESULTS

Preliminary findings suggest our mortality prediction models trained with missing data imputed with MissForest performed better than its counterpart trained on data that have had records with missing values discarded.

We are currently evaluating the MiCE and MiDAS packages. It is expected that the bulk of our research will be completed by the end of October.

DISCUSSION AND CONCLUSION

As above.

Additional note: This is a postgraduate research project with Orion Health in collaboration with the University of Auckland and Precision Driven Health. In addition to students Jiunn Howe Lee and Stephen Connor from Orion Health, Professor Thomas Lumley (Biostatistics, University of Auckland) and Professor Rod Jackson (Epidemiology, University of Auckland) are consultants on this project.

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ID 899 – SCIENTIFIC PAPER

What do employers want from health informaticians?

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INTRODUCTION AND BACKGROUND

Literature describes the competencies of health informatics professionals, including clinical informatics, clinical coding, project management, software development, and change management. Information technologies are at the heart of the New Zealand Health Strategy of 2016 under the 'smart system' theme. Few job advertisements and job descriptions related to health informatics describe these competencies or how they enable a smart system.

OBJECTIVE/PURPOSE

The aim of this research was to find out what employers want from the people whose job descriptions include health informatics competencies, what roles these employees occupy, and what competencies are core to the roles. The context of our research is the New Zealand health sector.

METHODS

After completing a literature review we conducted ten semi-structured interviews and analysed 46 job adverts from health-related job seeking websites. The interviews consisted of discussions of competencies described in the literature, and elicited descriptions of the ideal health informatics role, and how that might change in the future.

FINDINGS/RESULTS

Only six job adverts contained a direct reference to 'health informatics/information' in the job title. The nature of the roles was clinical (2) e.g. nurse, business (8) e.g. implementation consultant, and computer science (30) e.g. software developer. Computer science and business overlapped in the remaining six roles. There was no other overlap. Eight of the total roles were related to leadership. Experience required was one to three years, and most listed specialised experience, e.g. project management or agile test environment. Qualifications ranged from clinical to software development. Responsibilities included software development and maintenance (13), troubleshooting and support (5), customer support (7), project management (5), leadership (5). The interviews revealed challenges (lack of role clarity contrasted by role variability, perceived under-utilisation of health informaticians, shortage of skilled health informatics workforce, reliance on collaborative team work). The ideal health informatics role depended on the problem it addressed, the available skills, and the role's context.

DISCUSSION AND CONCLUSION

The health informatics workforce is underutilised, mostly because employers are unable to find appropriately qualified staff. Context (service environment and funding) influences job design and recruitment, which focuses on solving problems rather than building a workforce. These findings are consistent with the literature in other countries. The next step is to invite senior health service managers/executives to participate in small focus groups to discuss these findings to consider a workforce development plan for New Zealand.

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Clinical Case Studies + Digital Health Ideas

ID 794 - DIGITAL HEALTH IDEA

A clinical informatics view of the health system

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INTRODUCTION

healthAlliance (hA) provides shared information technology services for the four northern region DHBs. In late 2017, hA established the Office of the Chief Clinical Information Officer (CCIO) and employed two clinical informaticians to provide expertise, context and leadership.

It became evident that there was limited understanding by our ICT colleagues about how the health system worked. Existing models that were being used were inaccurate and often blended health profession disciplines with settings of care and service delivery, and used mixed taxonomy for function, process and service.

We set out to devise a simple model to describe the health system, and to help bridge the knowledge gap between clinicians and our non-clinical colleagues.

USE OF TECHNOLOGY AND/OR INFORMATION

We developed a new model of the health system that includes settings of care from the home to inpatient, and clinical and back office service delivery areas. This model is able to:

- conform with architectural definitions
- accurately align information systems and technology to the health system
- report consistently on system performance, outages and improvements against service delivery areas and settings of care
- have a clearly articulated model of the health system for use by project teams, industry partners and vendors
- demonstrate models of care and patient journeys across various settings of care and service delivery areas

IMPLEMENTATION/PROCESSES

Prior to implementation, validation was sought from senior medical and nursing clinical stakeholders in the northern region health system.

This model was endorsed at hA and is now used for reporting purposes that include: tracking investment, alignment with capital planning, reporting outages, and mapping current and future state patient journeys. An innovative use for this model has been its adoption at hA hackathons to determine hackathon settings.

A series of 'Lunch and Learn' education sessions were held at hA to introduce this model to the organisation and engage with our ICT colleagues. These education sessions were based on the CHIA Health Informatics Competency Framework: Competency Two, Healthcare systems and practice and basic biomedical science concepts.

CONCLUSION

This model has been successfully implemented at hA and next steps include adoption by district health boards, clinical informaticians, developers and vendors.

Obtaining clinical validation of the model was seen as an important step prior to endorsement at hA and demonstrates a growing understanding by our ICT colleagues for the clinical view of the health system.

WHAT MAKES YOUR SUBMISSION UNIQUE?

This is a clinically led idea that has been implemented at hA, with potential for widespread adoption

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ID 910 - DIGITAL HEALTH IDEA

A data driven health system, starting with data architecture

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INTRODUCTION

Clinical data is currently documented and collected in the Northern region with limited and variable clinical data standards, and with minimal alignment to health industry best practice. Clinical data that is unstructured, variable and lacking standards cannot easily be reused across care settings and applications, to enable clinical decision support and data analytics. Inter-operating across the region is hindered by aging technologies, social decisions and processes.

USE OF TECHNOLOGY AND/OR INFORMATION

The team at healthAlliance embarked on a project to develop an architecture model to define:

- data architecture that describes the required data objects, entities and attributes required for both clinical and non-clinical usage within the northern region. This includes conceptual, logical and physical models.
- clinical data (messaging) architecture based on the data architecture, for ensuring standardisation of data between systems to improve interoperability and data sharing.
- machine learning and semantic ontology are advance ways of implementing common data architectures to standards.

IMPLEMENTATION/PROCESSES

The approach to develop a data architecture model included a number of different factors:

- the team included clinical, IT and architecture expertise.
- in order to ensure alignment with international, national and other regional data architecture approaches, the team consulted with Deloitte, the Ministry of Health, Canterbury District Health Board, Capital and Coast District Health Board, and ACC .
- existing and endorsed national and industry data standards were referenced, including:
  - GP2GP, National Immunisation Registry, National Enrolment Scheme, and System Level Measures data architecture and messaging protocols
  - HL7 v3 and FHIR messaging protocols, as health industry standards
  - SNOMED-CT as endorsed by the Ministry of Health and the Health Information Standards Organisation (HISO) for clinical terminology standards in New Zealand
- Applying these standards and architectures to Proof-of-Concepts like the Health Information Platform show cases the power of the getting data architecture right to help drive better quality data and interoperability.

CONCLUSION

Reliable information at the point of care is imperative for a 'joined up' region to begin delivering better patient outcomes by becoming experts at interoperability and data sharing. This regional clinical data architecture model will set standards for the future application and data sharing landscape in the northern region, and next steps include mandating its use for compliance by vendors and regional application development.

Future data architecture issues that have been identified include the on going work required to develop the logical and physical clinical data models, to be utilised by the regional health system, hA and vendors. We have also identified the need to develop a clinical informatics workforce with expertise in clinical data architecture and terminology standards.

WHAT MAKES YOUR SUBMISSION UNIQUE?

- The formation of a clinical (doctor and midwife) and (enterprise) architecture team collaboration
- The development of a conceptual to physical clinical data model that has potential to be reused throughout the country by vendors and health services

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ID 822 - DIGITAL HEALTH IDEA

A Deep Learning Platform for GP Referrals Triage

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INTRODUCTION

Triaging referrals from primary care is an important process in any secondary healthcare service. It is the port of entry for most patients entering into the hospital system and has many downstream implications, in terms of prioritisation of case mix, waiting lists, investigations performed and ultimately cost. Inefficient triaging results in some patients being unnecessarily accepted for a hospital clinic appointment, which may delay appointments for those who should be seen sooner. Until recently primary care referrals were paper based limiting their use, however with electronic referrals there is the potential to mine the data held within them, and link this with existing health records.

USE OF TECHNOLOGY AND/OR INFORMATION

This research aims to provide an machine learning-based triage decision support system to improve health outcome for patients through efficient and timely processing of their referrals. We first aim to manually create a GP referral triage system using available patient records from Waitemata DHB. Subsequent stages focus on the automation of manual processes to adapt to another hospital or population. The adaptation includes either reuse of statistical knowledge learned from the Waitemata DHB dataset or training from scratch, leveraging the Orion Health Smart Data Platform.

IMPLEMENTATION/PROCESSES

Little research has been done to address referral efficiency using machine learning techniques. This is due in part to the challenging nature of working with electronic GP referrals in New Zealand, as they contain both structured and unstructured data. The primary goal of this project is to provide a decision support system for triaging referrals to make this task more efficient.

CONCLUSION

An automated triaging tool using Deep Learning could be translatable to other DHBs in New Zealand or overseas institutions. This could lead to a number of benefits. Firstly, cardiologist time can be freed up for more productive activities, and secondly, streaming patients to appropriate investigation, or triage categories can reduce downstream costs.

WHAT MAKES YOUR SUBMISSION UNIQUE?

This research is ambitious in the sense that we aim to change the way data-driven health is done in New Zealand. One outcome of this research will be to move the focus away from ad-hoc and hospital-specific solutions to a smart data platform that supports the sharing of population knowledge, data derived assets, and integrating local patient context.

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ID 934 - DIGITAL HEALTH IDEA

ACC and SNOMED: lessons learned from translation

Susanne Ames[1]

1. ACC

INTRODUCTION

SNOMED CT is emerging in NZ PMS/PAS systems. ACC's systems cannot accept SNOMED codes, so a translation table was created to receive SNOMED codes for injury diagnoses at claims lodgement and convert them to Read.

USE OF TECHNOLOGY AND/OR INFORMATION

The translation table was developed in Excel, using the SNOMED CT browser. The table generates Read translations for SNOMED codes in ACC's new health provider API. When a translation is not found, it is flagged and added to the table where possible.

IMPLEMENTATION/PROCESSES

Initial translations were made from 2016 lodgement Read diagnoses (~5400). We used a UK translation table and the SNOMED browser to find the best SNOMED equivalent. When the table went live, practice staff used codes that we hadn't translated, because no constraints were imposed. Sometimes this results in more accurate diagnoses, for example muscle strains identified separately from sprains. Practice staff occasionally used inappropriate terms, eg "Motor Vehicle Accident" instead of whiplash. This required follow up to determine the actual injury.

CONCLUSION

- ACC has begun accepting SNOMED coding, and is looking how to respond to the growing use of SNOMED.
- ACC's use of SNOMED be synchronised with conventions across the NZ health sector, and any unique requirements (such as causation) be clear and logically defined. Otherwise there is the potential for terminology confusion, wrong cover, and wasted effort. This is the opposite of what's intended for SNOMED to support.
- Continued reliance on translation increases risks that detailed meaning available in SNOMED is lost or misconstrued, and that ACC will increasingly be out of step with health sector information developments.
- ACC's further uptake of SNOMED will be made as part of other initiatives such as claims lodgement process improvements. Hopefully, this will allow fundamental review of the types of information required, and modern optimal ways of capture and management (for example, increased API usage).

WHAT MAKES YOUR SUBMISSION UNIQUE?

The UK based Read clinical classification system was widely used across the NZ primary health sector, and is being abandoned in favour of SNOMED. Little resource is available to guide migration from Read to SNOMED, and ACC has a particular challenge due to the injury and insurance focus of its work. ACC's experience is informative not just for developing SNOMED translation methodologies, but in illustrating the wider considerations of SNOMED use. SNOMED's analytic potential can benefit NZ health organisations, providers and patients if it is carefully implemented.

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ID 969 - DIGITAL HEALTH IDEA

Access, analyse, and predict: Machine-learning environment for clinical research

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INTRODUCTION

As health care becomes digital, the possibilities for clinical research and insights into health trends grow. Massive amounts of medical information are captured each day, creating rich clinical databases, but without access and tools to mine this data, meaningful insights and research cannot occur. The need for a tool that can access large data sets in an elastic environment prompted the creation of the Health Data Lab (HDL), a platform designed for data scientists and researchers, which provides open source statistical analysis tools and access to de-identified patient data.

USE OF TECHNOLOGY AND/OR INFORMATION

HDL gathers all available de-identified patient data, while enforcing limits on who can access data and when. Data sets used for research projects are available for regression and modelling, while access to unneeded information is restricted. By normalising, scrubbing, and de-identifying raw patient data, the system also prevents sharing and using patient-identifiable information in published research and data models.

IMPLEMENTATION/PROCESSES

The data sets are used not only for analysing historical data trends but also for creating predictive models and algorithms, which can be validated over time by the continually updated data lake of de-identified patient information. Data is taken from the data lake and transformed into a usable, consistent format, to ultimately create models. After running the predictive model, the model is scored and evaluated. Based on the findings of the evaluation, the model is adjusted accordingly. The finished model is saved and can be moved and loaded into other systems. This process is done entirely within one system, which can be accessed anywhere, facilitating the process of data discovery to create localised and unique algorithms, which are then validated using the patient population that is affected by the algorithm.

CONCLUSION

The amount of digital health data available continues to grow and having the tools to access this information is key in medical research and predictive modelling. The open-source tools allow researchers and data scientists to analyse current trends in medicine as well as build models to predict future trends. The tools are accessed within the same environment as the data being used, streamlining the process between gathering and analysing the needed data and speeding up the data analysis process. HDL is a system that links access to complete data with the tools needed to analyse, transform, and validate that data.

WHAT MAKES YOUR SUBMISSION UNIQUE?

This topic outlines the tools and possibilities that are finally available due to the advances and work done with in digital health. It introduces the audience to a world where individual sites can create and run models to assist in the creation of algorithms. This submission highlights a field many are interested, but few have had the chance to be a part of.

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ID 941 - DIGITAL HEALTH IDEA

AI Artificial Intelligence: Better Life Made Possible for the Elderly

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INTRODUCTION

Older people want to age safely within the comfort of their own home, staying active and maintaining an independent lifestyle for as long as possible. To do so, they need some support around them. Globally demand for PERS systems is growing rapidly. Reasons for this rapid expansion are the combination of an aging population with a higher life expectancy, resultant rising costs placing pressure on the public healthcare system and the growing demand from seniors to be able to stay at home for longer.

USE OF TECHNOLOGY AND/OR INFORMATION

The next evolution for healthcare organisations is the need to tackle these challenges through the use of innovative Artificial Intelligence. With technological advancements, senior care is undergoing a paradigm shift, going from passive to active. Elderly care was reactive – "I've fallen / can't get up" – then proactive – "a fall has happened" – now predictive – "a fall is about to happen." Technology that is making this change is artificial intelligence.

New generation AI, Personal Emergency Response Systems (PERS) machines learn about a senior's daily routines and habits, seamlessly and providing invisible healthcare, are able to predict a fall or detect a health condition by noticing a deviation from those patterns, and adapt over time, whilst providing them independence and preventing potential emergency situations. Smart devices are not only able to help prevent a fall, but also to help identify behaviour that may be indicative of diseases connected to aging such as early stage Alzheimer's. Smart devices also enable a quick response in case of emergency.

For decades, Telehealth companies offered a simple panic button however we now use technologies, such as fall detection, and voice recognition - which triggers an alert the moment a keyword is called such as if a person falls or is experiencing a sudden severe pain and the panic button is not at hand.

IMPLEMENTATION/PROCESSES

We believe that what makes aging-in-place technologies truly useful is the integration of multiple technologies within a single, comprehensive and seamless solution that may be expanded over time with additional services (e.g, smoke and water leakage detectors), adapting itself to each individual customer's circumstances and changing needs.

CONCLUSION

Securely is rolling out the new technology in partnership with Essence to empower Care Providers with AI technology. We will show you some actual case studies, live customers and some existing providers that are making transformational change to the way care is provided.

The outcomes of trials using this technology globally have been significant with reduced fall's, improved overall health and the early identification of diseases including dementia. The result is potentially reduced healthcare costs.

WHAT MAKES YOUR SUBMISSION UNIQUE?

Securely believes that this is the first widely available implementation of this type of AI technology in New Zealand. The potential cost savings to the health budget is significant.

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ID 825 - DIGITAL HEALTH IDEA

Are Super users the right super stars when implementing IT – does one size fit all?

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INTRODUCTION

Over the past 3 years CMH implemented a programme of work called Healthy Together Technology - 10 key workstreams to support the vision of 'technology enabled innovations to improve patient care'. These projects impact over 5,000 clinical staff, and have delivered over 2,000 training sessions, removed in excess of 100,000 paper forms and released time to care for clinicians across the organisation. Implementing the systems, delivering training and providing support to clinical staff has been challenging and rewarding, as staff navigate the stages of adapting to change. Several support models have been used to implement these applications, each with its own advantages.

USE OF TECHNOLOGY AND/OR INFORMATION

Implementation of IT applications in the clinical setting is challenging. Ensuring enough clinical support/ training is provided to adequately and safely transition staff to new ways of working is a difficult balance. Many staff are apprehensive about new systems, especially if patient safety is perceived to be at risk. A variety of models can support an IT project implementation and one size doesn't fit all. Are Clinical Coaches, IT trainers, Super users or Clinical Champions best? How do you choose?

IMPLEMENTATION/PROCESSES

At CMH we used different models of implementation depending on project size and complexity, impact on clinical workflows and number of staff roles affected eg an organisation wide roll out required a mixture of Super users, IT Trainers and Clinical Champions. Each had a specific role to play from mass socialisation to providing role specific training sessions. A different model was used implementing when eVitals, an assessment and observation system. Clinical coaches were seconded from wards to become expert users supporting organisational implementation. ePrescribing and Administration used Clinical Champions/ Leads for medicine and nursing who worked on clinical flows with staff. Super users were trained as the implementation went live.

CONCLUSION

Factors to consider in deciding the approach:

- Number of staff impacted
- Complexity of clinical workflows
- Complexity of the system and potential impact on patient safety
- Clinical engagement and support
- Time of year and availability of staff to support the implementation

WHAT MAKES YOUR SUBMISSION UNIQUE?

We will identify the different options for implementing IT applications and discuss implications of each model. CMH acknowledge that we have learnt many lessons from other DHBs and particularly grateful to ADHB/ WDHB for their support. We want to ensure as more DHBs implement IT applications that they too can learn from the different models and how/ when they work well.

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ID 870 - DIGITAL HEALTH IDEA

At a glance tracking of staff trainings by the nurse educator

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INTRODUCTION

The District Health Board (DHB) requires that staff complete compliance and mandatory training. Record to these learnings being attained or attended is currently kept on multiple software systems. There is no ability for these systems to communicate or synchronise the information they keep to produce a comprehensive report of either an individual or a cluster of staff's training record(s).

To plan education requirements a single platform was required to consolidate the information from the multiple systems to produce an "at a glance" overview to track whether staff had attained, were due to attend or had not attained education training.

USE OF TECHNOLOGY AND/OR INFORMATION

With no budget to introduce new software, we needed to use a platform already in use at the DHB where multiple people could input the data with minimal training.

IMPLEMENTATION/PROCESSES

A Microsoft excel spreadsheet template was adapted to create a traffic light colour coding report. This report indicated whether staff were certified as they had completed the training (green), were booked to attend (amber) or were uncertified having not completed the training (red). A date trigger alert (yellow) was later introduced to time sensitive certifications which required renewal. This indicated that a training would need to be re-done within a pre-determined time frame.

The initial creation of the spreadsheet required excel upskilling by the creator but once the layout of the report and data input was finialized, the spreadsheet could be used by a person with beginner to intermediate excel experience.

CONCLUSION

The release of the excel spreadsheet for use was in three phases. Phase one was the decision by the educator and manager on content that would be tracked by the service. Phase two was inputting of data and phase three was the introduction of the final formulas (date triggers).

A "how to use" guide will support users on setting up the spreadsheet and trouble shooting.

WHAT MAKES YOUR SUBMISSION UNIQUE?

The spreadsheet provides educators with vital information related to future planning for their staff learning needs. It also gives "at a glance" visibility to staff of their education tracking, encouraging accountability to complete learnings.

The design of the spreadsheet can be adapted to allow for other time sensitive data entry.

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ID 944 - DIGITAL HEALTH IDEA

Augmented Reality (AR) and Virtual Reality (VR) for clinical anatomy & regional anaesthesia training

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INTRODUCTION

Medical training in real clinical settings is not always possible for reasons of safety, costs, or consents from patients. Medical industries face obstacles to teaching and sharing information. For the most part, hands-on learning opportunities are extremely limited, both by the relative rarity of the occurrences of many medical scenarios and by dispersed geographic distribution. These limitations can be offset by advanced technology that puts learners in augmented or virtual environments that simulate real-life environments.

USE OF TECHNOLOGY AND/OR INFORMATION

Educational technology, more specifically augmented reality (AR) and virtual reality (VR) offer a highly realistic situated learning experience supportive of complex medical learning and transfer. AR is a technology that adds virtual content to the physical real world, thereby augmenting the perception of reality, whereas VR is a technology that immerse the user into the entirely virtual environment.

IMPLEMENTATION/PROCESSES

We have incorporated AR and VR into medical teaching and delivered the content remotely to students in places around the world since the beginning of 2017. We started with an anatomical model of the heart, where students or trainees can interact with their hand gestures to customise the viewing in different planes and dimensions. They can truly appreciate the function of the heart being superimposed on a real person. Through a combination of platforms (Microsoft Hololens and HTC Vive), we have extended our possibilities into different teaching models including but not limited to venesection, injection techniques, regional anaesthesia, various laparoscopic procedures. Through our one year of experience, our questionnaires have shown 97% positive learning experience and 95% of students are able to recall vital information according to our objectives at one-year post training. There were only 1% of participants who felt vertiginous and nauseated, but these were the people who had previously experienced motion sickness in moving vehicles anyway. With improving graphics and speed of processing, we anticipate these problems will be lessened. The benefits of using this type of technology would significantly outweigh its risks.

CONCLUSION

The future of medical learning is undoubtedly in augmented reality and virtual reality. We have shown the success of using this for anatomy teaching and regional anaesthesia training. We must embrace the new technology and push through challenges to new grounds in using simulations in medical education to accelerate the transfer of knowledge.

WHAT MAKES YOUR SUBMISSION UNIQUE?

We at Rev3 Tech are the very first to embrace the technology right from the forefront when the devices have become available and affordable in New Zealand. We have also developed the technology locally right here in Christchurch and have in-house programmers/ developers along with clinicians and software engineers.

Please visit some of our video demonstrations.
https://www.youtube.com/watch?v=VSIqqH5DkLQ,
https://www.youtube.com/watch?v=CigbBe52oew
https://www.youtube.com/watch?v=5kI_o0X-BRw

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ID 887 - DIGITAL HEALTH IDEA

Bed Status at a Glance – an approach using Power BI

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INTRODUCTION

Hospitals are at capacity more and more frequently now. It is imperative that we manage patient flow optimally through the hospital. There are a variety of at a glance views that would support this. One that features is the "Bed Status at a glance" providing

- a view of the beds and their real-time and future status.
- The ability to display attributes of the beds to best match potential patient candidates

USE OF TECHNOLOGY AND/OR INFORMATION

Use of Technology

- Power BI on Azure in a hybrid setting

Information

- Built on top of the Patient Administration System and Bed Management System to display information visually
- Feedback loop via the PAS system reflected in real time

IMPLEMENTATION/PROCESSES

We took the idea and participated in a 3-day Hackfest to prove out the concepts in Power BI (a technology we had not used before) in Azure. We got an excellent minimal viable product (MVP) as could have been expected for the event. This highlighted the concepts that could be possible - to outline a roadmap from a dashboard on power BI, Bed Cleaning form built on Power App and leveraging the mobile app with no additional effort.

Presented the Hackfest results to executive and senior leadership which got a excellent buy-in for the concepts and intent

Built a product backlog for development and ready to develop on commissioning the cloud infrastructure

CONCLUSION

Lessons learnt

- Hackfest or similar events are an excellent investment to prove concepts out
- Have big aspirational goals

Next Steps

- Push on getting a cloud platform that supports a hybrid infrastructure
    - On-premise data sources with the solution in the cloud
- Work through Cloud Risk Assessments

Future

With cloud infrastructure, there are opportunities to leverage all the service offerings

- Powerapps to supplement critical data points to enrich the bed status data (which we demonstrated at hackfest)

WHAT MAKES YOUR SUBMISSION UNIQUE?

- Power BI for a real-time dashboard
    - Power BI natively only has a data refresh rate of 30 minutes – we are aiming to model it slightly differently to achieve a near real-time experience
- Using a Hackfest to prove value
- Attempts to implement

- best practice visualisation principles to reduce cognitive processing
- Implementation of escalation states
- Present the most relevant information to the users
- The opportunity to introduce next best action

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ID 818 - DIGITAL HEALTH IDEA

Blockchain as a Service (BaaS) empowering health innovation

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INTRODUCTION

There has been much talk about the potential benefits of BlockChain or Distributed Ledgers, for the Health sector. One of the challenges is how to make this accessible and practical, whilst ensuring an "enterprise grade" solution. In particular, the integration of such solutions within a complex health systems environment can be problematic. In this session we will explore "Blockchain as a Service" (BaaS) and look at specific use cases.

USE OF TECHNOLOGY AND/OR INFORMATION

We will review the key benefits that Blockchain or Distributed Ledger technology offers the health sector, including:

- Audit trails - immutable records to track care for patients
- Supply chain - create efficiencies and ease administration
- Health records access tracking- give patients confidence in the privacy of their personal details
- Collaboration - safe and secure collaborative systems
- Tracking health goals with tokens

We will also review some of the key challenges we have seen in implementations to date. In particular, we will look at some of the common integration patterns and challenges.

IMPLEMENTATION/PROCESSES

After identifying a number of common impediments and hurdles in our early implementations with customers, this has led to the establishment of a BaaS (Blockchain as a Service) offering that is more readily consumed by the Health sector. In particular, we have tried to ensure we can efficiently address the common integration scenarios. We will profile how one organisation, iMed Radiology Network (www.i-med.com.au) has done this.

CONCLUSION

The option to incorporate this technology consumed as "Blockchain as a service" significantly lowers barriers to entry and allows rapid experimentation and productionisation of a new generation of health applications.

WHAT MAKES YOUR SUBMISSION UNIQUE?

This presentation focuses on how this emerging Blockchain technology can be readily accessed and incorporated in to healthcare solutions in a New Zealand context. The enterprise BaaS offering allows innovators to focus on the business implementation of their solutions rather than on the technical implementation of the underlying Blockchain technology.

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ID 850 - CLINICAL CASE STUDY

CADENZAA: virtuoso improvisation on a multidisciplinary project for healthcare quality improvement

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INTRODUCTION

Mortality is high following emergency laparotomy (10% at 30 days and 44% in octogenarians); this is ten times the mortality following first Coronary Artery Bypass Graft.

In the UK, the National Emergency Laparotomy Audit (NELA) has now been running for five years, involving over 90% of acute hospitals in England and Wales. The project showed continuous improvement in four areas: reducing mortality, length of hospital stay, better recognition of the sick patient and expediting surgery.

The Australia and New Zealand Colleges of Anaesthetists and Surgeons have recognised that this group of patients needs to be studied so that we can better assess the process of care and patient outcomes in both countries, and enable evidence-based improvement of outcomes. Thus ANZELA-QI, a bi-national quality improvement project, was launched in May 2018 with this specific purpose.

The Australian arm of ANZELA-QI is modelled on NELA and relies on traditional registry data collection via a separate audit form that is completed in addition to clinical work. In New Zealand, we felt that there is a better way to do this (see below).

USE OF TECHNOLOGY AND/OR INFORMATION

CADENZAA (CAre DElivery in NZ for the Acute Abdomen) is the New Zealand arm of the ANZELA-QI project. Using local knowledge to its best advantage, CADENZAA advances beyond the limits of a registry study by:

- Acquiring more comprehensive denominator data, recording all acute abdominal emergencies regardless of whether they were operated on. This is a significant design difference from NELA in the UK, where, for various reasons, these patients were excluded from the audit;
- Electronic extraction of data we already collect.

IMPLEMENTATION/PROCESSES

We will present the work that we have done to date for this project in terms of:

- electronic clinical document creation;
- existing clinical document improvement;
- clinical data extraction for research and quality improvement.

We will also discuss how we are collaborating with teams of clinicians, health IT and business intelligence experts in different DHBs to streamline data collection in ways that do not create a data collection burden for busy clinicians.

CONCLUSION

In addition to presenting our work to a wider audience as above, we are also interested in ideas for advancing this project further so that it can become a blueprint for sustainable continuous improvement of healthcare in New Zealand.

WHAT MAKES YOUR SUBMISSION UNIQUE?

This is the first project of its kind in New Zealand where multidisciplinary teams of clinicians, health IT and business intelligence experts are collectively harnessing existing information technology to combine "routine" clinical documentation with research and healthcare quality improvement for a large group of patients who are acutely and often severely ill. This is a highly collaborative project between different professions both within each DHB and also across multiple (and eventually all) DHBs.

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ID 929 - DIGITAL HEALTH IDEA

Catalysing behaviour change and improving knowledge sharing in Emergency Departments

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INTRODUCTION

One of the challenges faced by hospital emergency departments (EDs) is the over-prescribing of unnecessary treatments, including drugs, scans and pathology tests. Practitioners tend to focus squarely on treating the patient under their care, which usually results in excellent health outcomes. However, the associated costs can be excessive and difficult to predict.

USE OF TECHNOLOGY AND/OR INFORMATION

There are several factors specific to the ED context which frustrate efforts to improve the situation. The typical department is characterised by around-the-clock shifts, a highly dynamic and stressful work environment, and long working hours. The urgency of treatment means that education cannot be delivered via traditional means such as whole-of-staff meetings or on-the-job training, and there is understandable risk aversion to the application of new techniques and treatments emerging from academic research and clinical trials. Additionally, there is rarely extra space or time in the ED for another gadget or digital decision support tool.

IMPLEMENTATION/PROCESSES

The authors intend to apply the Model Oriented Domain Analysis (MODA) methodology to better understand the dynamics of a specific ED in terms of knowledge flows. This methodology enables the tacit knowledge embodied in teams of collaborating individuals to be represented as visual human- and machine-readable domain models, covering the perspectives of multiple individuals or roles. These models can then be compared to reveal mismatches, which may be simple mistranslations between the jargons in use by different disciplines or more fundamental misunderstandings arising from incompatible structures. Commonalities amongst domain models show where there is shared understanding within the team, whilst variations indicate the differences in perception across individual viewpoints. An analysis of these commonalities and variations can help teams identify challenges and opportunities. The interventions might include additional communication and organisational or cultural changes. MODA assists in clarifying roles, responsibilities, motivations and constraints in this context.

CONCLUSION

The authors believe that MODA will help surface "tears in the fabric" of business as usual, which would provide opportunities for sharing knowledge about the cost implications of treatment choices. Some interventions will follow known successful patterns already deployed, such as the Royal Brisbane and Women's Hospital's "80km speed limit" poster, which reminded clinicians to avoid cannulations unless they were 80% sure they would be used. Others will emerge from creative suggestions of the participants involved in the modelling exercises.

WHAT MAKES YOUR SUBMISSION UNIQUE?

As far as the authors are aware, a structured approach to formalising knowledge flows within and between teams in EDs has not been attempted before, and holds promise for revealing opportunities for improvement.

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ID 972 - DIGITAL HEALTH IDEA

Catching Up – ACC's Journey with APIs

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INTRODUCTION

Historically, ACC has been very prescriptive in how our providers need to submit their information, often requiring the installation of bespoke software to do so.

Application Programming Interfaces (APIs) are commonplace in other industries, but can be considered an emerging technology in the New Zealand public health sector.

ACC has launched a number of APIs for transactional provider submissions, that have the opportunity to materially change the end user experience for these transactions.

USE OF TECHNOLOGY AND/OR INFORMATION

Six APIs have been developed to replicate the most common provider to ACC transactions. These APIs introduce logic to minimise errors common with other submission methods. In addition, vendors consuming these APIs retain ownership over the end user experience.

IMPLEMENTATION/PROCESSES

API development focused on replicating existing submission form fields. ACC decided to replicate these fields to minimise potential disruption for providers adopting our APIs. Another reason this was done was to avoid changes on existing ACC infrastructure. Authentication was also replicated, with API submissions requiring the same active digital certificate that providers would use for existing electronic submissions to ACC. Where possible, field logic was introduced into the APIs to minimise the potential for submission errors and failures. We have seen comparatively slow uptake, due to a soft-launch and limited supporting external communications. However, a number of vendors have been testing against our APIs in the developer environment, with several vendors identifying creative ways of delivering the end user experience.

CONCLUSION

- APIs are a fantastic technology for facilitating efficient customer interactions, and empowering software vendors are develop the best possible end user experience.
- APIs can be used as a platform for creativity in the application and delivery of end services.
- Engage vendors/partners for co-design, as this will drive endorsement and appetite.
- Early engagement with the provider and vendor community is necessary to manage expectations and service uptake.

WHAT MAKES YOUR SUBMISSION UNIQUE?

ACC are the first health insurer in NZ to expose APIs for the provider/vendor community to develop against. We have a unique market perspective on the benefits, opportunities, and lessons learned from developing these APIs. By sharing this unique perspective with the audience, we expect to encourage the development of APIs within the sector, and to provide example of challenges and how best to avoid these.

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ID 979 - CLINICAL CASE STUDY

Click, wait... Click, wait... Reducing clinician frustration with fast access to an integrated patient summary.

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INTRODUCTION

Over the past 5 years, Waitemata DHB has put significant effort into implementing electronic systems to improve patient care. While these initiatives have improved patient safety and reduced time spent searching for paper records, an unintended consequence has been an increase in time spent waiting for data to load from disparate electronic systems.

Despite all applications being accessible via a clinical portal with single sign-on, only one is viewable at a time, and time spent clicking between them can amount to several minutes per patient on ward rounds.

This came to a head in December 17 when senior clinicians demanded new computers for ward rounds, despite the existing devices being less than 12 month's old. The seed for the Inpatient Snapshot was planted by a comment from an SMO:

Could a computer enter 'ward-round mode', where all the recent data for a list of patients is loaded into a computer's RAM for rapid access? If items were already loaded into memory at the start of the round, it would totally transform our work day compared to the current situation of click...wait...click...wait etc... Or is this an unrealistic dream?

USE OF TECHNOLOGY AND/OR INFORMATION

The approach was simple – to build a webpage that aggregated data from multiple production systems, and loaded quickly. We had access to a web developer, and have considerable experience querying information from the databases underpinning our clinical systems, so were able to produce the application entirely in-house.

IMPLEMENTATION/PROCESSES

Starting with just two systems, we produced a page that displayed the patient's observation chart, and prescribed medications. Since then, there hasn't been a week where a new feature hasn't been added, and information is now displayed from 18 different systems.

CONCLUSION

The snapshot was made available within clinical portal with no official communication. By the following afternoon, there had been >1000 views by 210 clinicians. On average, 685 patients are viewed each day, and there have been 262,000 accesses since December 2017.

Feedback has been universally positive, and the success is due to two key factors:

1. We have implemented clinical systems so data is available electronically, and have built up the experience to extract it
2. We listened to the clinicians' needs, and translated this into something useful

The access numbers are proof that the snapshot has transformed the way clinicians review their patients' health record and are evidently becoming increasingly reliant on its ability to integrate multiple applications.

WHAT MAKES YOUR SUBMISSION UNIQUE?

The snapshot was created out of a desire to provide a better experience for clinicians, struggling to access data during ward rounds; there was no formal project & no funding.

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ID 975 - CLINICAL CASE STUDY

Clinical Decision Support - Help or Hindrance?

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INTRODUCTION

Clinical decision support (CDS) in theory, once implemented, is job done with little consideration for its long-term consequences. Very seldom do clinicians and system administrators review the efficacy and appropriateness of these warnings in the dynamic and ever-changing field of medicine. Literature has reported on the phenomenon of alert fatigue, which is particularly prevalent when there are a large number of ineffective CDS warnings.

USE OF TECHNOLOGY AND/OR INFORMATION

Electronic prescribing and administration (ePA) systems, such as MedChart®, provide a wealth of functionality and information that is readily available but often poorly utilised. System administrators have good intentions with respect to maximising the benefits provided by these systems, but can arguably become overzealous with the implementation of CDS. Therefore, there is great value for project stakeholders to determine whether CDS is a help or hindrance in providing personalised patient care.

IMPLEMENTATION/PROCESSES

As part of the successful implementation of MedChart® at Waitemata DHB, across approximately 1000 beds, a number of CDS warnings were implemented. These range from drug duplication warnings to drug-laboratory interactions and enables the MedChart® rules engine to provide basic, personalised clinical decision support during both the prescribing and administration process. To analyse the appropriateness of, and response to these warnings, queries were performed against the MedChart® database. Preliminary findings suggest mixed results for CDS at the point of care in guiding prescribing and administration behaviours.

CONCLUSION

The advent of ePA has allowed for around-the-clock clinical guidance through the utilisation of CDS. However, there must be a robust system in place to objectively review these warnings post-implementation to ensure that maximum benefit is obtained to enhance patient care.

WHAT MAKES YOUR SUBMISSION UNIQUE?

Waitemata DHB has one of the largest and most mature implementations of MedChart® in New Zealand with an agile workforce, placing us in a prime position to evaluate the contribution CDS warnings can make in promoting judicious prescribing and administration practices.

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ID 885 - DIGITAL HEALTH IDEA

Clinical Document Semantic Search – A user-centred approach to clinical information seeking

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INTRODUCTION

Clinicians spend significant amounts of time and effort searching for clinically meaningful information across electronic patient records, including clinical documents. These are typically manually filtered based on basic document criteria such as type and date ranges with limited search capabilities. Clinical documents contain both structured and unstructured data. Un-coded clinical narratives cannot be easily retrieved by clinicians supporting their patient care. Clinical workflow and health outcomes are hindered due to this limited timely access to crucial information. Existing literature and our research data indicate that information retrieval processes across clinical applications involve manual curation of narratives which are challenging and time-consuming.

USE OF TECHNOLOGY AND/OR INFORMATION

The goal of this Precision Driven Health project was to design an intuitive information retrieval/seeking system as a proof-of-concept that enables clinicians to search for clinical concepts within electronic documents within Orion Health's Clinical Portal. Combining user-centric design approaches with machine learning and natural language processing technologies to extract and index SNOMED CT concepts from patient records will produce a more intuitive, user-friendly experience resulting in more accurate, timely patient care.

IMPLEMENTATION/PROCESSES

This research investigated and observed information-seeking behaviours of several clinicians working in intensive care settings. A multi-method approach used contextual inquiry and semi-structured interviews to discover end-user needs, in combination with a Design Sprint to explore several solution ideas for the prototype design. We are developing prototype solutions incorporating many recommendations that eventuated from these observations.

Clinical requirements for information retrieval require more than keyword matching due to the nature of complex clinical concepts. Often inconsistent naming conventions are used for describing clinical concepts, for example, "HTN", "HBP", "High Blood Pressure" and "Hypertension". Information needs to be presented to a user through semantic concept matching and inferred results which may assist in providing more relevant information.

CONCLUSION

Findings from observed information-seeking behaviours suggest that current systems in New Zealand are not solving all of the problems identified. Incorporating early and ongoing clinical user co-design with a high priority in the design and development of the prototype solution has been successful. We expect that the proposed prototype solution (under development) will address the problems discussed in an intuitive and user-friendly way by utilising SNOMED CT concepts with natural language processing. Future work will include solutions that consider clinical reference guides embedded in the clinicians' routine workflow.

WHAT MAKES YOUR SUBMISSION UNIQUE?

Findings from observed information-seeking behaviours suggest that current systems in New Zealand are not solving all of the problems identified. Incorporating early and ongoing clinical user co-design with a high priority in the design and development of the prototype solution has been successful. We expect that the proposed prototype solution (under development) will address the problems discussed in an intuitive and user-friendly way by utilising SNOMED CT concepts with natural language processing. Future work will include solutions that consider clinical reference guides embedded in the clinicians' routine workflow.

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ID 914 - DIGITAL HEALTH IDEA

Clinical information sharing – have we achieved a mobile first, seamless experience?

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1. Health Care Innovate Pty Ltd
2. Intrahealth

INTRODUCTION

Over 80% of health professionals use mobile phones to share patient information through unsecure channels, including email, SMS or commercial messengers. This practice introduces a high risk of privacy breaches. Importantly, delays or breakdown in care coordination increases the risk of incidents and unnecessary patient re-admissions. A significant proportion of information shared in informal channels is not annotated in the patient's medical records, compounding the risk of vital information not being accessible to the care team.

USE OF TECHNOLOGY AND/OR INFORMATION

In 2016, we designed an interoperable platform that would provide any clinician a secure and privacy-complaint alternative to email, texting and messengers, with the option to link all information automatically with relevant patient records. The prototype was a simple-to-use, secure image/video notification and messaging solution to fast-track the notification of critical radiology findings.

The NSW Government Innovation Grant supported the initial project launched to a group of private specialists in August 2016. Since, it has been adopted across the primary, specialist and hospital sectors.

IMPLEMENTATION/PROCESSES

In early 2018, a group of 120 medical specialists asked us to integrate with their EMR system to enable mobile patient look up and all information shared (images, video, files) to be offloaded to the EMR record. Clinicians start conversations from their EMR workflow with one click. Any relevant information already in a patient's record can be added with one click.

We initially facilitated cross-referrals and patient assessments. We then expanded to Multi-Disciplinary Team discussions and currently implement a secure communication hub merging both personal and system-to-system secure communication.

CONCLUSION

Enabling streamlined clinical communication results in better patient outcomes. With feedback from pilot projects, we understand that existing workflow integration enhances adoption, as does a high level of interoperability with minimal input from the client's side.

We recognise that secure messaging across sector has many use cases overcoming the challenges of highly specialised, fragmented and remote health care.

WHAT MAKES YOUR SUBMISSION UNIQUE?

We have shown that the often ad-hoc clinical interactions can be captured in a secure and highly efficient environment, which ultimately helps both clinicians and patients. Maximising interoperability between existing systems whilst harnessing emerging mobile technology has helped us achieve this. We are currently working with EMR vendors across AUS and NZ to facilitate cross-sector communication in a highly secure and mobile manner.

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ID 901 - DIGITAL HEALTH IDEA

Collaboration made the switch from MIMS to NZULM a breeze

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1. Counties Manukau Health

INTRODUCTION

The three Auckland District Health Boards, ADHB, WDHB and CMH serve a population of around 1.6 million people. At any point in time there are approximately 23,000 service users open to Mental Health and Addictions services across the Auckland metro region.

In 2016 the DHBs made the decision to implement the use of NZULM across all DHB services. The challenge for Mental Health and addictions services including the Regional Mental Health Forensics and Alcohol and Drugs Service, was that the drug formulary that has been used for recording and prescribing medicines in the single instance Auckland metro regional electronic medical record, 'HCC, since 2009 has been MIMS.

USE OF TECHNOLOGY AND/OR INFORMATION

The issue of replacing the formulary would impact on 83,633 existing prescriptions in the clinical records that would need to be converted to the new formulary. The challenge relating to clinical users who would be prescribing medicines would be to provide a process that was straight forward and easy to adapt to using NZULM as the dictionary and the NZF webservices

IMPLEMENTATION/PROCESSES

By working collaboratively with the vendor, who was based in Canada, we were able to identify our expected requirements to bulk-update the most commonly prescribed medicines from MIMS to NZULM. We also described scenarios for the preferred workflow for clinical users to be able to discontinue previously prescribed medicines and replace or re-prescribe these in NZULM with as little impact as possible to users and service users.

The vendor would make available the latest functionality to us that they had tested in their QA environment, which we would then test in our environment with the volume of data that was in our system. We would then feedback to them and they would enhance or re-build it to better suit our needs. At times team viewer sessions were a useful way to demonstrate how the functionality behaved given our particular configuration and workflow.

We engaged medical staff in discussion regarding the plan to make the switch and kept them updated of progress.

CONCLUSION

Using the interactive collaborative method for describing and examining the issues that presented during the development phases resulted in a 'fit for purpose' solution.

WHAT MAKES YOUR SUBMISSION UNIQUE?

We are unaware of any other service that has the volume of prescription data already within their records that has had to replace the formulary with another one and where the relationship with the vendor has enabled such a smooth transition

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ID 856 - CLINICAL CASE STUDY

College of Surgeons adopt SNOMED CT for data capture and reporting

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1. CSIRO

INTRODUCTION

The Royal Australasian College of Surgeons (RACS) have pursued a visionary e-health, future-proofed data environment for their clients and stakeholders who contribute data to their Morbidity Audit LogBook Tool (MALT). MALT collects data about the surgical experiences of Trainee Surgeons in order to track their experience and performance during internship.

The MALT software pre-dated SNOMED CT, was owned, developed and controlled by RACS themselves, but was due for re-engineering. RACS was not a greenfield proposition, and they needed to preserve legacy data, smooth the change process, and develop new technology and terminology in staged fashion to meet their business-as-usual and operational requirements.

USE OF TECHNOLOGY AND/OR INFORMATION

The input data collected via MALT is encoded in SNOMED CT, using a specially developed Reference Set (RACS RefSet), designed by RACS users.

This input data is then aggregated for reporting purposes and becomes output data, which is required – downstream - by senior supervising surgeons and College Fellows.

The output data is encoded in a SNOMED-based grouping layer, designed and specified by RACS to meet their analytic and reporting requirements. It provides a comprehensive, cumulative overview of all Trainee experiences, regardless of their surgical specialty or intern placements.

Both the RACS RefSet (a subset of SNOMED CT content) and the RACS grouping layer have been deployed in off-the-shelf analytics tools.

IMPLEMENTATION/PROCESSES

Over the past two years RACS has deployed SNOMED CT across desktop, iPhone and tablet platforms. Users have quickly embraced the new RefSet content and have continued to request expansion of the content coverage from SNOMED CT. The Australian Digital Health Agency (ADHA) has supported these requests, creating more than 400 new procedure concepts and releasing the new content in SNOMED CT-AU in a timely manner.

RACS analysts and the MALT Training Review Boards continue to make regular use of the output data to support their business needs.

CONCLUSION

Engagement with Clinical Colleges can provide effective clinical governance for the adoption of SNOMED CT. SNOMED CT is clinician friendly for data capture and for use by organisations for aggregation and reporting. Little change has been evident in the aggregation layer, this provides data stability over time, allowing trend data analyses to proceed, and to accurately report the length and breadth of Trainee experiences (as their internship periods are over three years).

In recent months RACS have connected to the ADHA National Clinical Terminology Service (NCTS), so they now enjoy expanded terminology support at reduced cost. Their experiences from design, development and deployment has allowed them to become almost entirely self-sufficient users of SNOMED CT.

WHAT MAKES YOUR SUBMISSION UNIQUE?

This case study highlights that adoption of SNOMED CT can serve a variety of uses, from clinician documentation and data capture, through to stable reporting requirements, as well as more on-the-fly data analytics.

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ID 874 - CLINICAL CASE STUDY

Community Nurse Prescribing CMH experience

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INTRODUCTION

In 2016 NCNZ proceeded with the proposal for community nurse prescribing. The programme was developed within two trial and evaluation sites. A Non-Governmental Organization (NGO) and a District Health Board (DHB). Both organizations saw the potential to enable nurses working in the community setting to prescribe range of medicines to a normally well population. The nurses working in both organisations were using standing orders in their everyday practice.

The restricted formulary of pharmaceuticals included over the counter medicines, contraception and sexual health, a range of first line prescription medicines to treat minor skin, sore throat and ear infections to a normally well population.

This presentation will concentrate on the experience of the nurses who undertook the programme at Counties Manukau Health. 33 nurses completed the programme from 5 PHO's and CMDHB, 6 secondary schools and public health nursing including Mana Kidz nurses based in primary schools.

USE OF TECHNOLOGY AND/OR INFORMATION

The programme of learning consisted of two face to face teaching days then the nurses completed 5 on-line learning modules. The programme was designed for nurses to use the electronic Auckland Regional Health Pathways to guide their decision making to reduce variation in practice and consistent use of patient resources.

IMPLEMENTATION/PROCESSES

The programme was developed in collaboration with NCNZ and the two organisations. The programme was designed to support nurses to learn in practice in their work setting. On -line learning programme designed and hosted on Ko Awatea learn that nurses could access at a time to suit them.

The DHB programme consisting of 60 hours of blended learning with endorsement of a portfolio including demonstration of competencies, supervision in practice, two case studies, learning log, panel review , endorsement of safety to prescribe by the programme then an application to NCNZ

CONCLUSION

All of the 33 nurses completed the programme and gained prescribing rights. An independent evaluation is currently underway for NCNZ to consider any changes needed prior to spreading the programme. The nurses have more job satisfaction, improved team relationships, increased critical thinking, and more clinical assessment skills.

All learning modules developed will be available to other organisations which will help to provide consistency in learning outcomes.

The programme has been well supported by Medical Practitioners and Nurse Practitioners locally.

WHAT MAKES YOUR SUBMISSION UNIQUE?

This is the first programme for the third prescribing scope in NZ. The programme has been designed to be provided in clinical practice through a re-credentialing programme. There were multiple employers and nurses working across a variety of clinical settings.

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ID 977 - CLINICAL CASE STUDY

Crossing the boundaries: Overcoming the challenges to developing a regional solution for management of patients with Rheumatic fever.

Nathan Billing[1], Greg Williams[1], Thomas Glynn[1]

1. Auckland District Health Board (ADHB)

INTRODUCTION

For the past 15 years newly diagnosed cases of Rheumatic fever (RF) within the Auckland metropolitan region have been added to a register setup to deliver penicillin prophylaxis to children within the community. The database was developed using Microsoft Access 2003 and has been used to track patients and ensure patients receive regular prophylactic antibiotic. In 2009 a proposal to obtain funding from government to establish a national web based register for Rheumatic fever was unsuccessful. The access database continued to be used and in 2014, as part of a Windows 7 upgrade project, was identified as requiring remediation. A business case was developed based on the need to replace this database and improve current processes to minimize the amount of duplication of information captured for other systems when registering and managing patients with RF.

USE OF TECHNOLOGY AND/OR INFORMATION

A number of potential replacement options were considered with the final decision to use in house developers and the Orion Clinical Work Flow Suite, to develop a series of forms to streamline workflow and provide front line nurses with tools to facilitate real time monitoring of patients injections within the Auckland metro region.

IMPLEMENTATION/PROCESSES

A series of regional workshops were held to determine the requirements to replace the current RF register. The focus was on maintaining the high quality epidemiologic data previously collected, while also providing opportunities to reduce the duplication of effort in terms of other data. We were able to provide a number of enhancements to the current database and incorporated some of the following functionality:

- Electronic notification for new Acute rheumatic fever disease to Auckland Regional Public Health Service
- A mechanism to capture case review information for Ministry of Health and automate reporting of this data
- A means for cardiologists and other specialists to keep track of their patients and when next appointments are due
- A real time search to help district nursing teams manage their patients and identify when patients are due their next injection. Thereby facilitate better shared care for younger patients receiving treatment over school holidays across DHB boundaries.

CONCLUSION

This solution is now live and in use by the community nursing teams at Auckland District Health Board and Waitemata District Health Board, with plans for the nursing staff at Northland District Health Board to come on board in the months ahead. There are 117 users of the system and this solution is currently being used to manage 457 patients and this number is growing.

WHAT MAKES YOUR SUBMISSION UNIQUE?

This project is a culmination of 3 years work; it highlights some key learning's on the complexity and challenges of getting regional solutions in place for patients who are cared for by different district health boards within the Auckland region.

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ID 938 - DIGITAL HEALTH IDEA

Crossing the street to SNOMED adoption in primary care

Alastair Kenworthy[1], Zeeman van der Merwe[2], David Bratt[3]

1. Ministry of Health
2. Accident Compensation Corporation
3. Ministry of Social Development

INTRODUCTION

The first health care homes are now using SNOMED CT in software that supports new models of care and gives patients and clinicians an awesome user experience. Replacing the Read Codes employed since the 1990s in primary care records, SNOMED is essential to our digital future as the universal language for health and social information. While the benefits of SNOMED are clear, this has been a hard change to get started. Seeing that some health providers were ready to move, representatives of our three agencies – the Ministry of Health, Ministry of Social Development and ACC – crossed the street to work with each other and our brave early adopters.

USE OF TECHNOLOGY AND/OR INFORMATION

SNOMED is a standard for more detailed and actionable information about health and disability status, interventions and outcomes than before. SNOMED enables new levels of care coordination and clinical decision support, supporting the New Zealand Health Strategy. SNOMED is a key tool for smart software and interoperability, touching many systems, processes and interactions.

IMPLEMENTATION/PROCESSES

Our inter-agency team worked with the early adopters to understand their needs and learn where we could help and remove roadblocks to adoption. We developed implementation guidance and adapted our own information systems to enable health providers to use SNOMED in their transactions with us. And we committed to a coordinated effort for change over several years. SNOMED is now live in several general practices.

CONCLUSION

Our agencies have learnt how to work in a new way based on trust and a common purpose around public service in the health system. We have worked closely with leading health providers and their industry to remove roadblocks and pave the way for others. There are lessons in three areas: implementation of a pivotal new standard, technology change and overcoming barriers to adoption.

WHAT MAKES YOUR SUBMISSION UNIQUE?

This submission shows our three government agencies working in a novel joined-up way to deliver a pervasive change in the health system. This promises to generate a tide of improvements for years to come as part of our digital future in health and social care.

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ID 909 - DIGITAL HEALTH IDEA

Data Driven Service Improvement - Reducing Variation in Practice; Planning for the Future.

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INTRODUCTION

In the New Zealand healthcare system unwarranted variation in treatment between different cancer centres means that patients are often receiving different care for identical conditions. Unwarranted variation cannot be explained on the basis of illness, medical evidence or patient preference. This unwarranted variation undoubtedly leads to wasting of resources and poorer patient outcomes. Currently, New Zealand does not collect contemporaneous data on radiation treatments or provide a facility for clinicians and managers to understand and benchmark activity within their cancer centre.

USE OF TECHNOLOGY AND/OR INFORMATION

New Zealand radiation oncology centres in conjunction with the Ministry of Health have developed a minimum dataset for all patients undergoing radiation treatment throughout New Zealand. This unique dataset reflects current practice and provide more up to date and reliable information than many other datasets.

IMPLEMENTATION/PROCESSES

The data set was created by utilising the existing oncology patient management systems within both public and private centres. A data query was created and run across multiple databases from multiple vendors to provide a consistent validated data stream.

This was amalgamated with data from existing collections such as the Cancer Registry and the National Health Index (NHI) to provide regular snapshots of activity and to allow for predictions of demand into the future whilst accommodating potential changes in clinical practice.

An online tool was then developed to allow analysis of access to treatment and treatment delivery by tumour type, ethnicity, DHB of treatment and DHB of domicile.

The Radiation Oncology Working Group and the Ministry of Health are currently developing processes around how to identify, investigate and ultimately reduce, unwarranted variation.

CONCLUSION

This online tool can be utilised by practitioners and managers to identify and respond to unwarranted variation in practice thus facilitating the implementation of the National Radiation Plan (https://www.health.govt.nz/publication/national-radiation-oncology-plan-2017-2021). This will lead to improved resource utilisation and reduce inequity of access to treatment in both the public and private sectors leading to improved patient outcomes and experiences.

WHAT MAKES YOUR SUBMISSION UNIQUE?

This is the first national database which includes 100% of all patients treated with radiation in both public and private settings. It is the first to include an online predictive tool to enhance local, regional and national planning for cancer services as well as adopting novel visual displays to allow clinicians to detect variations in practice as they occur.

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ID 924 - DIGITAL HEALTH IDEA

Death Documents gets off to a lively start

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1. Ministry of Health

INTRODUCTION

When someone dies a medical or nurse practitioner completes a number of paper forms. These forms are passed to the funeral director who interprets the handwriting and registers the death with the Department of Internal Affairs (DIA). The Ministry of Health mortality team processes about 27,000 paper medical certificates of cause of death per year. It takes 30-50 days after the death to add the date of death to the National Health Index (NHI) record and to notify the health sector of the death.

USE OF TECHNOLOGY AND/OR INFORMATION

An online system will enable early notification of deaths to health providers preventing the distress caused when deceased persons are invited to attend health services (e.g. specialist appointments, elective surgeries or immunisations). Service providers can then reallocate these appointments to avoid wasting valuable resources.

It will improve the quality of the cause of death data used for mortality statistics, health research and international reporting.

Allowing funeral directors access to Death Documents to view records for the deceased persons they are arranging services for will eliminate the need for them to physically collect those records from hospitals, aged care facilities and GP practices and will enable them to commence funeral arrangements sooner.

IMPLEMENTATION/PROCESSES

We took a service design approach which meant we spent a lot of time discovering what the pain points were for all different parties affected by the current processes.

The common message was to make it easy for the practitioners, easy like filling in the paper form.... and then better. Get that right and all the downstream users will benefit.

We

- developed the essential features that would deliver the most benefit to all users, then made it available to early adopters
- found champions who were happy to promote the service
- worked hard to ensure the service complied with legislative requirements
- made the app intuitive to use, with on-line help and a short YouTube training video to help new users and assist uptake
- kept improving it for all parties, so word of mouth and good communications spread the news.

CONCLUSION

We rolled out a national system to health practitioners located in many different settings - hospitals, hospices, aged care facilities and in the community. Early adopters were using it within 4 months of starting the development. We doubled the users each month for the first 3 months and the service was delivering approximately 10% of all certificates written within 5 months of Go Live on 1 March 2018.

We learnt:

Deliver a useable product early and unexpected benefits present themselves.

WHAT MAKES YOUR SUBMISSION UNIQUE?

We did a few things that hadn't been done before in health

Ministry of Health partnered with DIA to engage a vendor and together delivered a product used by health practitioners and funeral directors to fulfil their legal obligations.

It's a web-based product outside of Connected Health.

It uses RealMe for account and password managementand verified RealME to authenticate users.

It uses the Ministry's Health Provider Index (HPI) APIs to ensure users are qualified health practitioners.

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ID 844 - CLINICAL CASE STUDY

DeeR Dr. Referrals as a communication platform

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INTRODUCTION

DHB electronic eReferral (DeeR) forms were developed initially to allow general practitioners to refer patients for specialist consultation in hospital clinics. This connected disparate primary care practice management systems with hospital systems. However there was no electronic way for those within the hospital to use this system to make referrals to another service or another hospital, creating a 2-tiered system of paper and electronic referrals at the receiving end.

USE OF TECHNOLOGY AND/OR INFORMATION

The second stage of the eReferrals project focused on electronic forms for clinicians in DHBs to make referrals to other services within their own DHB or to the regional services in other DHBs. This used the existing technology but made it available to a different group of users.

IMPLEMENTATION/PROCESSES

This involved a regional team across three DHBs and primary care along with our shared IT service agency healthAlliance.

A soft go-wide was particularly successful. A new icon appeared in the clinical portal and was found by staff who just started using it within 10 minutes, demonstrating its intuitive format. In the first week, 180 referrals were sent by early adopters. Since then, with very little prompting other than staff emails and notices on the intranet, increasing referrals are being sent with over 3,000 sent at the end of 2 months. Feedback from frontline staff has been particularly positive, but they are also "voting" with their keyboards and using it.

CONCLUSION

This was a successful cross-DHB project. DHB staff are open to electronic forms replacing paper forms, and little training or promotion of new processes may be required as long as the form is easy to use and saves clinical time.

WHAT MAKES YOUR SUBMISSION UNIQUE?

Complex cross setting and DHB boundaries work can be very challenging. This project is the culmination of many years of hard work which has laid the foundation for an almost complete referral network within the Auckland Metro region. This is the largest and most complete implementation within New Zealand to date.

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ID 936 - DIGITAL HEALTH IDEA

Delivering precision medicine solutions at the bedside to improve Maori health.

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1. Precision Medicine International Limited

INTRODUCTION

Taking medications 'as prescribed' kills more people each year than diabetes or traffic accidents or lung diseases. Non-Caucasians experience more life threatening adverse drug reactions than Caucasian patients because of differences in genes involved in the metabolism, absorption, distribution and excretion of drugs. The genetic differences also result in more non-Caucasians receiving sub-therapeutic dosages and effectively no treatment when compared to Caucasians, despite taking medications as prescribed by their doctor. Maori and Pacific Island populations, for example, are especially vulnerable to treatment failures in cardiology and psychiatry due to their pharmacogenetic makeup. As a result, Maori have significantly lower life expectancies when compared to Pakeha.

USE OF TECHNOLOGY AND/OR INFORMATION

Pharmacogenetic research is over five decades old and currently over 100 medications have international guidelines for DNA-based prescribing. For example, international guidelines indicate that many Maori patients need a 50% reduction in the initial dose of cardiac or psychiatric medications metabolized by the gene CYP2C19. This scientifically robust knowledge base is not being used to guide treatment and doctors continue to use trial and error to care for their patients. Innovation in information technology is required to deliver precision medicine solutions in the clinic and at the bedside.

IMPLEMENTATION/PROCESSES

Precision Medicine International Limited has developed an innovative DNA-based digital health tool to implement pharmacogenetics-based prescription for over 550 medications. The precision medicine solution, called XY Leap, is a combination of proprietary genetic hardware and analytic software that has been customised specifically for Maori and Pacific Islanders. When pharmacogenetic testing is implemented it has a significant impact on reducing healthcare costs and improving patient outcomes. For example, pharmacogenetic testing has recently been found to reduce emergency visits by 71% and hospital readmissions by 39%.

CONCLUSION

A trial of the XY Leap Precision Medicine Platform is currently being conducted in the North Island. This talk will present the DNA-based digital health tool and demonstrate how easy it is to use at the bedside or in the clinic to improve health outcomes for patients throughout New Zealand.

WHAT MAKES YOUR SUBMISSION UNIQUE?

Innovative cutting-edge precision medicine information technology customised to improve the health outcomes of Maori.

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ID 889 - CLINICAL CASE STUDY

Delivery of an online Emotional Wellness Programme for Mental Health conditions in Primary Care

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1. Melon Health

INTRODUCTION

Primary care is experiencing an increasing burden of mental health conditions. Many of these are in the early to moderate category that do not require specialist support or treatment. However, the resources for dealing with these in Primary Care are limited and current models of care are mostly face-to-face. As such many patients are not able to access appropriate support.

USE OF TECHNOLOGY AND/OR INFORMATION

Melon has been providing online solutions to assist healthcare providers in supporting patients to self manage for the last six years. Our goal was to replicate the primary care integrated delivery model of our metabolic programme - using an Emotional Wellness programme to help patients experiencing mild to moderate mental illness.

The self management programme consisted of a multi-faceted offering for individuals experiencing mild to moderate mental health conditions such as depression and anxiety. It included a private, secure peer support community, access to online clinical support delivered by mental health professionals or social workers, tools for monitoring progress, and content to provide individuals with techniques and skills to support their recovery, better understand their situation and foster ongoing engagement.

IMPLEMENTATION/PROCESSES

The 12-week Emotional Wellness programme was implemented in two large Primary Health Organisations (PHOs) in New Zealand. This was funded through the PHO's existing Primary Mental Health funding streams. Core content was developed by Melon Health with some additional content developed and provided by one of the PHO's. Patients were enrolled after initial screening confirmed they were clinically appropriate and willing and able to participate in the programme.

The PHOs clinical teams were flexible to allow clinical assessment and follow-up support to be delivered through the technology (direct messaging, calls or video conferencing) and were able to monitor patient progress via a clinical dashboard. The peer community was monitored by a registered mental health nurse to provide additional support, and monitoring for safety.

CONCLUSION

Early evaluation of the programme has shown significant improvements in standard patient outcome scores (PHQ 9, GAD 7, and Kessler 10), and indications of excellent patient satisfaction. Clinical teams have identified some challenges in adopting an alternative model of care, particularly when trying to implement this alongside business as usual. There were some technical challenges associated with implementation that additionally impacted the utility but overall the clinical team appreciated the potential for improved patient experience and outcomes and delivery at scale.

WHAT MAKES YOUR SUBMISSION UNIQUE?

It is the first example of a digital health programme for mental health that integrates with primary care, delivered in New Zealand. It demonstrates the successful delivery of a new model of care supported by a digital self-management programme, in an area of significant burden which has been chronically underfunded. This indicates the potential ongoing delivery at scale to help address these issues.

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ID 948 - DIGITAL HEALTH IDEA

Development of IoT based Smart Therapeutic Outdoor Furniture for Gait and Mobility Assessment of Elderly

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INTRODUCTION

The population of elderly people in New Zealand is growing rapidly and it is reported that within the next decade the population of people aged above 65 years will increase from 550,00 in 2013 to 1 million in the late 2020's. Mobility is of utmost importance, as it defines the independence, quality of life and health of elderly population. It is a well-known fact that impaired mobility in elderly is an important surrogate marker to identify numerous disease-causing mechanisms and their progression, severity. By assessing the mobility of elderly using embedded wireless smart sensor-based outdoor furniture installed in public spaces would help provide key information to assist in therapeutic decision making and proactive health management.

USE OF TECHNOLOGY AND/OR INFORMATION

The designed smart bench takes readings through wireless pressure sensors embedded at the seat, feet of the bench and capacitive touch sensors embedded in hand grips. These readings will be identified with a user through the use of NFC/RFID technology and concurrently sent to a database. From the database the readings will be processed to be presented on a web application in a comprehensible viewing format for healthcare professionals.

IMPLEMENTATION/PROCESSES

A smart bench prototype has been developed and constructed to allow for testing of embedded wireless sensors that are able to capture relevant data. The readings taken by the bench will be of sit-to-stand exercise over a one-minute period, using a standard time span allows for comparative analysis of progression and regression of the ability of the user to stand up from the bench. The data by the sensors on the smart beach gives an indication of the user's leg muscle and core strength. The seat plate of the smart bench will house most of the technology in the testing unit, that includes a pressure plate for seated pressure testing and capacitive handrails. For data processing, transmission an Arduino based micro-controller with NFC shield and Wi-Fi/3G shield for internet connectivity are used. By combining the data from the smart benches and the proposed "smart pathway" would help user's healthcare professional in recognizing balance and gait abnormalities and thereby enables early diagnosis of gait disorders.

CONCLUSION

The research is directed towards the development of IoT based smart therapeutic outdoor furniture for gait and mobility assessment of elderly. Our objective is to design and develop outdoor smart benches that will act as a part of a larger scoped project that will help in providing preliminary data from users to healthcare professionals for efficient, economic gait and mobility assessment.

WHAT MAKES YOUR SUBMISSION UNIQUE?

The use of smart therapeutic outdoor furniture in public spaces for gait, mobility assessment of elderly is a novel idea.

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ID 878 - DIGITAL HEALTH IDEA

Digital flow for Variance Response Management: the ADHB journey

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1. Auckland District Health Board

INTRODUCTION

Variance Response Management (VRM), part of Care Capacity Demand Management (CCDM), is about matching demand (patient acuity) and capacity (nursing hours) using tools and processes that provide accurate forecasting, visibility in real-time, early warning systems and review of performance over time.

There was the requirement to implement a solution to allow nurses to electronically capture the variance indicator score (VIS) so that there is visibility of VIS across the hospital to monitor and respond.

USE OF TECHNOLOGY AND/OR INFORMATION

Technology

.Net development – Provider Hosted Application embedded in Sharepoint on tier 1 infrastructure

Information

- Built a semantic layer on the reporting solution
- This allows self-service click and drag capability for the end super users to report themselves
- Health Intelligence to build the more sophisticated solutions such as dashboards
- Delivered a real time report/ dashboard for monitoring VIS across the hospital on our reporting tool with the ability
  - To be displayed on screen unattended with auto refreshing
  - To be scheduled out as required to an email distribution
  - To collate historical instances of the report.

IMPLEMENTATION/PROCESSES

- Business Driven based on VRM Group.
- Provider Hosted Application in Sharepoint – chose this method to keep in line with the intranet, branding to provide a consistency
- Agile development
- Working collaboratively allowed us to understand the flow to see what would add value to variance response management workflow e.g
  - links to the quality system for incident reporting
  - links to Trendcare for acuity scoring
- Roll out by directorates –
  - Monitor –
    - look at the trends of the score, determine the specificity and sensitivity of the measures
    - Understand the drivers behind how they scored and educatedor tweak the measures and weights
  - Roll out by directorates to ensure that variance reporting and variance response are done well at the outset in a controlled fashion.

CONCLUSION

- Don't reinvent the wheel – used site visits to visualise what went well elsewhere and use the effort to add value on top of that
- Using agile works
  - allowing feedback to be factored back into the application.
  - Ensured engagement through development
- Flexibility/configurability

    - ensured a rate of change of could be maintained and sustained by business administrators
    - empowers the administrators to be self-sufficient
- Fund the team not a project – we used the solutions team to deliver this - opportunity to continue to maintain a backlog

WHAT MAKES YOUR SUBMISSION UNIQUE?

- Considers the broader process to support the nurse at the centre
    - Using Sharepoint opened up a range of opportunities to support the nurse with the tasks associated with VRM
- Flexible, configurable solution – entirely managed by the administrator
- Built-in Alerts/ notification to allow passive monitoring for responders who are on the move
- It is a national initiative, and it is good to share how we did it

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ID 906 - DIGITAL HEALTH IDEA

Digital Health – Chasing the "Red Queen"

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INTRODUCTION

Can digital health solutions stand on their own when it comes to engaging populations, individuals and even the health system? When it comes to consumer engagement, digital platforms typically see a 30 day spike in engagement results, with a gradual decline over 90 days. Incentives, gamification, challenges and behavioural economics are all tools we can use to drive motivation and engagement, however, the question remains, does it create long term sustained engagement in digital solutions? The answer is, mostly a repeat of short term engagement results and a lack of long term health outcomes. In contrast, digital health is not like online banking, where, we have a continuous reason to return.

USE OF TECHNOLOGY AND/OR INFORMATION

Sharecare was conceived in a rapidly evolving environment of multiple digital technologies and point solutions, one in which consumers have become overwhelmed with choice but lack an aggregation point. Sharecare developed a solution, which takes a "high-tech, high-touch" approach that combines wellness and navigation features. Sharecare helps people manage "all their health in one place", which is, Sharecare's vision of a world where the consumer is at the centre and in control of their individual health journey. Sharecare turns consumer motivation into action through a couple of key principles:

Messaging: In-app messaging, video content, mobile, desktop, activation events and traditional media; we message the user at the right time to motivate action.

Motivating: Personalised content, challenges, and Green Days (our daily metric that users obtain by meeting their well-being goals) help to create and improve health habits.

Management: Builds a health profile, bringing consumers health together in a central, easy-to-use, location. Claims integration and information gleaned through our tools, such as Find-a-Doctor and Symptom Checker (AskMD), make it easier for consumers to navigate the healthcare system.

Measurement: Using artificial intelligence and behavioural analysis from our robust and dynamic database, Sharecare provides powerful insights to our clients on the health of their populations.

IMPLEMENTATION/PROCESSES

Sharecare has launched its solutions across the United States, and more recently in Brazil. The on-boarding process for consumers is key, and that is what sets the scene for long-term sustained engagement. As part of on-boarding, the RealAge Test (Sharecare's proprietary health risk assessment) is key to understand the consumer and to drive personalised engagement. Sharecare uses artificial intelligence, machine learning and predictive algorithms to drive digital intervention and focused intervention through a clinician.

Sharecare has over 70 million consumers using the app, and over 30 years of experience in disease management and chronic care.

CONCLUSION

Sharecare has built the bridge between sustained engagement and healthcare navigation by establishing healthy habits; regular habits that are repeatable and that ultimately drive behaviour change through a unique "high-tech, high-touch" approach, which helps consumers manage "all their health in one place".

WHAT MAKES YOUR SUBMISSION UNIQUE?

Sharecare helps consumers manage "all their health in one place", through a "high-tech, high-touch" approach which drives sustained engagement and delivers population health outcomes at scale. Sharecare is challenging existing consumer healthcare paradigms and will ultimately disrupt how individuals engage with the health system, including their personal healthcare journey.

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ID 925 - DIGITAL HEALTH IDEA

Digital Health Standards – what you need to know

Peter Marks[1]

1. Ministry of Health

INTRODUCTION

We are in the age of the online citizen. The internet, digital-wearables, and AI are among the technologies that enable consumers to take more control over their health & well-being. The NZ Vision for Health Technology and the Digital Health Strategy (DHS) place emphasis on:

- enabling patients to be an active participant in their use of health services
- the management of a person's health data
- the collection & sharing of health data and associated insights.

To support the vision and strategy, 3 sector working groups were formed in May 2018 to update the architecture, standards, and roadmaps for adoption, for digital identity, interoperability, and connected health - key foundational digital enablers.

Outcomes from the working groups will be completed by September 2018. The outcomes will include the upated standards and adoption roadmaps for each of the enablers.

USE OF TECHNOLOGY AND/OR INFORMATION

The DHS lays out a view of architecture and standards as key enablers in achieving the digital strategy. Having clear consistent architectures reduces the cost and complexity of introducing new solutions into an environment. Standards are essential for ensuring consistency across applications and organisational boundaries.

The 3 sector working groups were tasked with developing the architecture and standards required by Digital Identity, Interoperability, and Connected Health to meet the objectives of the DHS.

IMPLEMENTATION/PROCESSES

The working groups reviewed the existing architecture and standards against the needs of the DHS. They used the experience and expertise of the working group to develop a future state view and adoption roadmap for their domain areas.

CONCLUSION

The DHS lays out a digital future that enables the consumer to actively participate in their health journey. To support this vision, 3 sector working groups were formed to develop architectures, standards, and roadmaps for adoption of these foundational digital enablers. The DHS requires the mandatory adoption of these architectures and standards in order to successfully deliver its objectives.

WHAT MAKES YOUR SUBMISSION UNIQUE?

The output from the sector working groups will be specific and mandated as part of the DHS. This presentation will provide understanding of what they are and what this means to you. It is important for people to understand the roadmap and incorporate these expectations into local plans.

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ID 836 - DIGITAL HEALTH IDEA

Digitalizing the nursing assessment process, targeting clinical risk?

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1. Waitemata DHB

INTRODUCTION

Waitemata District Health Board (WDHB) has been running an eVitals (Patientrack) project for 2 years and have moved beyond vital sign collection and integrated nursing admission and assessments. This has required the recreation of admission documents and integration of evidence based risk assessment tools. We aim to demonstrate both the effectiveness and efficiency of these digital tools.

USE OF TECHNOLOGY AND/OR INFORMATION

Using Patientrack on fully mobile devices, bedside data collection has been revolutionized at WDHB with a rapid admission checklist that both gathers essential mandated data and screens for additional risks; moving from a 20 page "one size fits all" admission document to an efficient bedside process. Previously completion of admission documentation was time consuming, not patient centred and compliance was variable. Charge nurse managers (CNMs) could not identify omissions without note review and audit was time consuming. Integrating Patientrack with reporting services and creating simple links for staff creates transparency and enables real time response.

IMPLEMENTATION/PROCESSES

By integrating clinical guidelines to screen risk, the 20 page booklet is reduced to a simple checklist and when specific questions are answered, this opens and schedules an appropriate risk assessment. This digitalized process reduces by 50% documentation time in complex elderly admissions, with even further reductions in less complex elective admissions. Admission checklist documentation is now completed within 8 hours of ward admission in >95% of cases, previously 35 -50% based on ward. Using evidence based guidelines appropriate risk assessment tools are scheduled, for example if an admission is aged ≥75 and having a surgical procedure a Waterlow pressure injury assessment is scheduled. Overdue or omitted activity is viewable on Patientrack in realtime.

CONCLUSION

Digital transformation is not about putting paper charts into an iPad mini but about using technology to support clinical practice and make processes more efficient.

Digital nursing assessments are user friendly, rapid, accurate and well received by nursing staff; the ability to review remotely in real time improves compliance and audit transparency. On evaluation < 2% of staff would return to paper.

The Patientrack journey at WDHB is on-going and further digital conversion is planned particularly in paediatrics and maternity.

WHAT MAKES YOUR SUBMISSION UNIQUE?

Currently we are the only DHB in Australasia using Patientrack with this wider spectrum of assessment and activity tools. As a mature Patientrack site we have completed evaluation of our Patientrack and mobility solution roll out.

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ID 845 - CLINICAL CASE STUDY

Doctor in the house: remote specialist consultations by telehealth

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INTRODUCTION

Most DHBs face issues with long waiting lists for outpatient clinics and high non-attendance rates at clinics. Waitemata DHB has been working on reducing face-to-face scheduled outpatient clinic visits by investigating other options for addressing patients' needs. One of these options is video remote consultations. This reduces the barriers of time, travel, cost, and other family members having to take time off work.

USE OF TECHNOLOGY AND/OR INFORMATION

As part of a regional process to implement telehealth technology, fifteen clinicians tested three video conferencing platforms for remote consultations with patients in their homes.

IMPLEMENTATION/PROCESSES

We identified clinician champions who were very keen to try video for remote consultations. These were across five different services (CADS, ORL, diabetes, OT, child development). They were enabled and supported to trial the technologies (one at a time) on desktop, laptop, tablet or smartphone. More than 100 remote meetings were conducted (clinician to patient, clinician to clinician). The proportion of patients who consented to a video remote consultation varied across the services. Reasons for declining included: access to a device, access to data/wifi, access to a confidential space, and difficulties with the technology. Feedback was obtained from 35 clinicians and 34 patients/whanau - 88% said they would be happy to use telehealth again.

"It made things so much easier. Didn't have to battle traffic or pay parking and no waiting. This is an awesome idea especially for people that can't drive or struggle to find a way to their appointments"

Further testing and evaluation will be taking place prior to the conference that will be included

CONCLUSION

Clinicians and patients who experienced telehealth were generally positive about potential future uses. Clinicians require time to practice with the technology to increase their confidence and perfect their webside manner. Patients preferred access via the web than an app, and were more accepting of 'glitches' than clinicians. Work is still required on scheduling telehealth clinics and on patient preferences and equity of access.

WHAT MAKES YOUR SUBMISSION UNIQUE?

While other DHBs have led the way in telehealth development in New Zealand, specialist consultations with patients in their own homes is still rare. Feedback from patients and clinicians, and investigation into who declines remote video consultations and the reasons for this, is valuable information for all other health services.

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ID 953 - DIGITAL HEALTH IDEA

Dramatically improving cost-effective delivery of care through machine learning models

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INTRODUCTION

There is an estimated $1 trillion worth of wastage in the U.S. healthcare system alone that can be attributed to many causes, ranging from duplication of administration efforts and lack of medication adherence, through to avoidable patient readmissions. Healthcare is experiencing increasing costs, massive pressure on budgets and a projected shortfall in the clinical workforce. Using machine learning models will improve the way health systems target limited resources toward those patients with the greatest needs, driving better outcomes and reduced costs. The ability to predict patient outcomes and clinical decision support tools can give clinicians context around the data, allowing them to quickly understand the patient, the conditions, and interpret the information for that individual patient.

USE OF TECHNOLOGY AND/OR INFORMATION

Healthcare organisations need to reduce costs, avoiding preventable hospital readmissions, poorly managed diseases and unnecessary visits to A&E. Orion Health solutions can be used to predict the health outcomes of populations allowing for early detection and early intervention, fostering healthier populations. We are building solutions that have the ability to make meaningful use of this data and provide analytical insights to drive decision making. This will have a significant impact on the health outcomes of billions of people.

IMPLEMENTATION/PROCESSES

One key example of the positive impact Machine Learning can have on health is the HOPE (Health Outcome Prediction Engine) project. The engine is designed to identify patients at risk of an Abdominal Aortic Aneurysm (AAA). This research project was carried out by Precision Driven Health, a public-private partnership between Orion Health, Waitemata District Health Board and the University of Auckland.

A precision screening trial of 800 patients was conducted for Abdominal Aortic Aneurysm (AAA), a rapid and silent killer for people 65+. The trial identified 36 patients with AAA through the data analysis. One patient needed surgery to remove a 6cm bulge in his abdominal aorta, the precision screening saved his life.

CONCLUSION

Using machine learning models presents a huge opportunity for the health sector, where data science can help target health interventions to those with the greatest need. A recent report by Accenture has predicted that machine learning applications can save the United States health systems up to $150 billion per year by 2026.

WHAT MAKES YOUR SUBMISSION UNIQUE?

Machine learning represents the biggest opportunity to leverage these existing investments and deliver significant cost reductions for health systems. Orion Health is leading ground-breaking research into the possibilities for machine learning in healthcare.

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ID 956 - DIGITAL HEALTH IDEA

Dynamic structured forms. How they can improve record keeping and lessons from implementation

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INTRODUCTION

While flexible, writing patient notes as free text has its drawbacks. It is easy to forget items to note down, you have to type everything, they can be difficult to read quickly, and there can be little consistency between the notes of different health workers. Unstructured notes are also usually difficult to query for reporting purposes.

USE OF TECHNOLOGY AND/OR INFORMATION

The author developed a system built on dynamic, structured content that offers health providers and researchers the ability to efficiently write queryable, comprehensive progress notes. The core system has been supplemented with a sophisticated document management tool, ACC integration and reporting tools.

IMPLEMENTATION/PROCESSES

Content was created for a wide range of professions and organisations, from dementia care social workers to a GPwSI (skin cancer), and from private, single practitioner clinics to nationally distributed NGOs.

Feedback thus far has been very positive, with many users reporting they are taking more comprehensive notes, faster. Meanwhile their notes can be a valuable source of data for research and business reporting.

Significant commonality has been observed across users of all professions, including the tension between not wishing to have note taking interfere with the relationship with the patient, and needing to take comprehensive notes.

The author will propose that dynamic structured notes offer a way to collect the required detail in real-time without significantly compromising patient interaction, backed up by examples.

Challenges to correct implementation will also be shared and strategies suggested to overcome them.

Finally the author will share plans for future development, including a move to patient-centric architecture, advanced shared care and integration with other systems.

CONCLUSION

Dynamic, structured forms seem to offer a practical and powerful alternative to free text notes with exciting potential, especially in regard to reporting.

WHAT MAKES YOUR SUBMISSION UNIQUE?

The author's approach to record keeping is believed to be unique and the experience gained while implementing the system in both private clinics and NGOs is unlikely to have been replicated elsewhere.

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ID 795 - DIGITAL HEALTH IDEA

Early detection of drug related Side effect: Drug based vs. Prescription based approach – Experience from single tertiary care centre

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INTRODUCTION

Adverse drug reactions are common in health care setting. Errors at both prescribing and monitoring stage contribute to ADRs. Most available information technology (IT) tools focus at the prescribing stage. One of the main concerns at the monitoring stage is early detection of drug related side effects (SE's).Early detection of SE's followed by corrective action can improve drug compliance ,reduce morbidity and mortality. However, due to their large number and variable SE frequency, early detection of SE and identification of possible causative agent among group of prescribed drugs is often difficult and overlooked.

USE OF TECHNOLOGY AND/OR INFORMATION

1. Drug based vs. Prescription analysis – Quite often, multiple drugs in a given prescription can cause same side effect. Most EMR systems provide side effect information about individual drug. However for the treating physician at the point of care, it is a tedious job to review each individual drug profile to indentify the probable causative agent. To provide information in more meaningful manner, we developed system that collate together the side effect profile of each drug and present data in the form of table with each side effect matched against the list of potential causative drugs arranged in descending order of likelihood to cause the SE.
2. Temporal correlation of SE with the prescription history – To correctly pin point the offending drug, a temporal analysis between the onset of SE and the prescription history is also done

IMPLEMENTATION/PROCESSES

Two versions of software were compared – The simpler version provides all the drug related information in tradition manner. In advanced version, following features were added

1. Display of all SE with potential causes arranged according to frequency.
2. Simultaneous display of lab values corresponding to SE and highlighting abnormal values.
3. Temporal course between onset of side effect and drug history.

Example of side effect table generated by advanced version

Side effect Common or very common Uncommon Rare, Very rare Frequency not known

Alert values/investigation log/Temporal analysis

Hyperkalemia Ramipril pironolactone Serum Potassium:

Alert values:-

1. 5.1meq/l on 23/5/2018
2. 5.4 meq/l on 26/5/2018

View full investigation log + drug log

The two versions were tested in 1:1 ratio in our hospital over one year period

Key outcomes assessed –

1. SE detection rates
2. Physician satisfaction and usability score
3. Drug compliance data

4. Mortality benefit

CONCLUSION

1. Use of advanced version resulted in improved outcomes in all the above parameters.
2. Use data analysis and AI to further refine the process of early detection and prevention of ADRs.

WHAT MAKES YOUR SUBMISSION UNIQUE?

To best of our knowledge, the use of current approach is not available in commercially available EMRs.

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ID 842 - DIGITAL HEALTH IDEA

Precision Driven Health Partnership Success

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INTRODUCTION

The Precision Driven Health partnership, established in March 2016, is one of the most ambitious data science research initiatives to be undertaken in New Zealand. The partnership unites our health IT sector with health providers and universities to create health and commercial opportunities for New Zealanders.

Precision Driven Health (PDH) was created to put NZ at the forefront of the global precision health movement through world-leading research. This involves applying new data science techniques to understand the massive volume of data that an individual generates across systems including health information systems, consumer devices, social networks, and genomics. The initiative will invest $38 million over a seven-year period.

USE OF TECHNOLOGY AND/OR INFORMATION

In the first two years, PDH has invested in 45 projects, supporting over 70 researchers including academics, students and industry. Some of these have led to prototype apps for vital signs monitoring and discharge management, chatbots, growth charts and stroke outcome prediction. Others have involved pilot studies that have saved lives, such as precision screening for abdominal aortic aneurisms. The PDH team were awarded the Research & Business Partnership Award at the KiwiNet Awards in 2017.

IMPLEMENTATION/PROCESSES

At HINZ, a number of projects supported by PDH will be presented. Each one represents a partnership between clinical, scientific and commercial parties. Some of the current exciting PDH projects include predicting and tailoring interventions to individual patients.

One area of research for PDH focuses on the application of deep learning to electronic health records. PDH is building a platform to combine the different data types contained in a patient's health record, and predict multiple outputs. It aims to analyse all information on an electronic health record (EHR) to find patterns and combinations of risk factors, giving clinicians a more holistic view of a patient. Ideally, once a person's health data is collected and stored on their EHR, deep learning could be applied to help clinicians find "patients like me" - the deep learning model would be able to define what aspects of similarity were important.

PDH research has also looked at image classification for skin conditions, medication reconciliation, and the development of New Zealand-specific risk calculators. All of these approaches are leading to a suite of tools available to the health sector and data science researchers.

CONCLUSION

PDH has made a successful start, and initial projects are showing a lot of promise for improvements to health decision making through the use of data science tools. The engagement across public and private sector partners has been critical to the success of this work.

WHAT MAKES YOUR SUBMISSION UNIQUE?

PDH is a genuine partnership across public and private parties. This has led to a greater understanding across different parts of the sector, and a collaborative working relationship.

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ID 798 - DIGITAL HEALTH IDEA

Electronic Health Record (EHR) and Electronic Content Management (ECM) Roles in Integrated and Connected Care

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INTRODUCTION

As patients and their care increase in complexity, so does the need to collaborate with healthcare colleagues in a multidisciplinary environment. A significant challenge to effective collaborative care is often poor communication and accessibility to relevant patient information across all members of the care team.

Complex patients frequently move between acute and ambulatory settings and may require access to community support services for needs such as behavioural health and adaptive equipment causing the complexity of their documentation to increase as well as creating data silos where the documentation is stored. A better solution is to store all of this content in a single repository such as an Enterprise Content Management System (ECM) and make it available through the Electronic Health Record (EHR).

USE OF TECHNOLOGY AND/OR INFORMATION

Organisations can pair their EHR and ECM solutions to complement each other providing the multidisciplinary care team the single point of access to all relevant information needed for collaborative care. When tightly integrated they create a seamless user experience where the care team does not need to log into disparate systems or reselect the patient. The ECM is able to ingest content from multiple sources that reside outside of the EHR. ECM creates metadata that normalises the content while also safely and efficiently organising, managing, storing, and presenting the content to end-users from the single point of access that is the EHR. ECM has robust audit trails and security features ensuring the correct multidisciplinary team members see content relevant to their role and the patient.

IMPLEMENTATION/PROCESSES

The audience will take away the following learning point:

- Benefits of pairing their ECM with EHR to provide a single point of access to all relevant information needed for collaborative care.
- Benefit of dismantling information silos and instead storing content in the centralised ECM system.
- Robust audit trails can help organisations information governance objectives.

CONCLUSION

By providing all patient information from a single source, the multidisciplinary care team members can find what they are looking for easily in one place instead of having to access multiple systems. Team members can share documents and content amongst each other, or with peers, by creating specialty case containers. Robust auditing trails and security profiles ensure that there is no compromise in information governance and that only the team members with the correct security permissions can access content.

WHAT MAKES YOUR SUBMISSION UNIQUE?

I have credibility as a project manager implementing ECM solutions to compliment the EHR. I know first hand how why these two technologies should be paired, the benefit to the organization and clinicians and how they enhance the user and patient experiences.

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ID 918 - DIGITAL HEALTH IDEA

Electronic Queue Management Solution at Out Patient Department of National Dental Hospital (Teaching) Sri Lanka

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INTRODUCTION

The National Dental Hospital (Teaching)-Sri Lanka, is the premiere multidisciplinary dental and Maxillo-Facial care provider, such as outpatient care, in-patient care, ambulatory care, emergency services oral health promotion and prevention of oral diseases with the full spectrum specialties in Dentistry.

The Electronic Queue Management System(EQMS) optimizes service times and waits times, and ensures that patients are served fairly quickly. The major benefit to patients is that the EQMS provides them the freedom to utilize their waiting time as they chose: moving around, sitting down, reading a magazine or brochure, or taking a walk outside.

The automated system tracks each patient's movement from initial point of entry to the final point of service delivery; giving administrators have the ability to identify key events such as service time and wait time exceptions, peak traffic, queue lengths, best performing staff members and many more statistics.

USE OF TECHNOLOGY AND/OR INFORMATION

High Level Architecture - This software solution development will be done using PHP. Web will form the consumer layer of this software Solution.

Database - MySQL will be used as the database management system. MySQL runs as a separate service and is connected to via TCP/IP: which means that it can be run physically separate from the application server.

Security - We recommend SSL and HTTPS protocol to communicate across the EQMS.

Reporting - Report generation based on pre-defined templates in formats such as PDF, HTML. Further it should provide capabilities such as filtering criteria and parameterized report generation.

IMPLEMENTATION/PROCESSES

The system will be used to issue a token number with the category such as Regular, Appointment, and Staff. The Institution name, time of arrival, and the date also printed in the token. The Queue Management System consists of 05 users, namely the administrators, front desk Personnel, OPD Doctors, Senior Hospital Dental Officer, Dental OPD assistants.

- A token will be provided to all patients after the patient registration
- Patients will be waiting for the token number to be called.

Equipment: LED Screen displays, Token Dispensers, Wireless Access Points, Room Display Units, EQMS software, Android devices, Consumables

CONCLUSION

After the Focused group discussions with all relevant clinical staff, the EQMS was developed and implemented and running successfully at the NDHSL for last 07 Months

WHAT MAKES YOUR SUBMISSION UNIQUE?

It was the first time in a state sector Hospital a queue management system implemented and successfully continuing. Plan for dissemination of the findings: The findings and experience of this project would be presented in national and international forum by means of publications, presentations, posters and etc. Ethical considerations and clearance: This does not involve human subjects, cadaver or animals therefore ethical clearance was not required. Impact on the environment and clearance: There won't be any environmental impact by this project. Therefore the clearance from Central Environmental Authority is not requirement.

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ID 987 - DIGITAL HEALTH IDEA

Electronic restructuring of weekend handover processes

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INTRODUCTION

Weekend handover processes at Whangarei Hospital were identified as an area of weakness, particularly by junior staff. Concerns were raised of an effect on patient safety. This made weekend shifts stressful and confusing for junior staff and nurses alike. Lack of standardisation and duplication of workload were areas of particular frustration. This led to a project being undertaken to improve these processes.

USE OF TECHNOLOGY AND/OR INFORMATION

A Microsoft Excel pro-forma was implemented to improve handover processes. A template was made available on a shared drive, and used each week by teams to perform their handover, instead of the previous paper system.

IMPLEMENTATION/PROCESSES

Survey data was gathered before implementation as qualitative data to help define the problem. This identified concerns regarding handovers as primarily a junior staff issue (registrars and house-officers), and identified lack of education and lack of standardisation as key elements in the deficiency in handover quality. Quantitative data was gathered by marking the quality of handovers on a ten-point scale, validated with SMO input. The pro-forma was then implemented, and modified using informal feedback during the process in multiple PDSA cycles over a six-week period. Uptake of the pro-forma was excellent, and handover quality improved using quantitative and qualitative measures. Handover effectiveness, as defined by survey responses, improved from 4/10 on average amongst junior staff to nearly 8/10 as a result of the intervention. In addition, there was a perceived improvement for patient safety and 100% of respondents agreed that handover processes were better than previous.

CONCLUSION

Handover quality and satisfaction with handover processes improved significantly. There was a perceived improvement for patient safety. Balancing the complexity of a new electronic system with user engagement and buy-in; and balancing standardisation for quality purposes with freedom to articulate complex issues were key learning points from the project.

Given time constraints (8-9 days to work on the project), Microsoft Excel was used for proof-of-concept. The next step is to move towards a live patient record, to enable information handed over on a daily basis by nurses and doctors alike, regularly updated with input from the broader medical team.

WHAT MAKES YOUR SUBMISSION UNIQUE?

This submission shows that a simple intervention without high resource requirement can have a significant impact by clearly defining the problem and introducing a user focussed solution

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ID 802 - DIGITAL HEALTH IDEA

Embedding interRAI as a Patient Management System

Gabrielle Stent[1]

1. TAS

INTRODUCTION

interRAI is the primary assessment instrument for older people in New Zealand, used both in aged residential care and in the community, to identify care planning and service needs.

interRAI assessments are a group of comprehensive clinical assessment instruments. They are specifically designed to identify opportunities for improvement and/or any risks to the person's health, which the assessor then uses to form the basis of a care plan. interRAI assessments are completed on software on a single national platform that incorporates a patient management system.

USE OF TECHNOLOGY AND/OR INFORMATION

Most aged residential care facilities are moving towards a 'paperless' environment but for smaller providers, the cost of purchasing an electronic management system can be prohibitive. One small facility approached me to discuss what the interRAI assessment process could provide.

IMPLEMENTATION/PROCESSES

The first step was to understand the needs of the facility, what they were already doing and how this met resident and auditing requirements. I reviewed copies of their daily reports, care plans and diversional therapy records and adapted these into the software. Implementation was planned so it would cause as little disruption as possible to daily work flow. Staff were trained to use the software. 'Teething' problems were ironed out before moving to the next stage. Regular progress reviews were made with facility management. Training was 'hands on', acknowledging the cost of releasing staff for training and having the system up and running in a timely way. Training also needed to meet the needs of those who had little computer literacy.

CONCLUSION

The facility is now close to having interRAI fully embedded as their resident management system. They passed their first audit using the new system. Staff have quickly adapted to completing reports electronically. Additional reporting functions are now used. Opportunities for further changes have been identified. Another facility has started to embed interRAI in our district. Learnings from each facility are shared to improve the process for all.

WHAT MAKES YOUR SUBMISSION UNIQUE?

Using interRAI software as a resident management system had not been trialled in NZ until now. These facilities are pioneering the move by taking their mandatory assessment system and using this electronic record to save themselves thousands of dollars. The implementation means facility staff and other health providers can access resident information when required. No other system currently enables this level of connectivity in the residential sector.

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ID 872 - DIGITAL HEALTH IDEA

End-to-End De-Identification Framework

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INTRODUCTION

Health data has been captured electronically for decades and with the help of Electronic Health Record (EHR) initiatives, the range and volume of these data are increasing more than ever. Analytical research can produce valuable predictive models showing deeper insight from such data, which can lead to revolutionary advances such as those seen in other industries, e.g. self-driving cars. Individual patient consent is generally required before accessing raw health data for research purposes "unless data is de-identified". The de-identification guidelines in most legislation lack specific implementation details, creating different interpretations of what constitutes de-identified data. It is often considered that simply removing identifiable demographics provides sufficient de-identification, but this increases re-identification risk.

USE OF TECHNOLOGY AND/OR INFORMATION

We started investigating existing de-identification tools and selected an open source de-identification tool (ARX) as a base to create an end-to-end de-identification framework. This framework is being developed. Its input data formats can be csv files or database tables. Applying a combination of various techniques such as k-anonymity, l-diversity, date-shifting, pseudonyms and long-tail achieves the creation of purpose-met de-identification output which also meets patient privacy needs under a given risk threshold.

IMPLEMENTATION/PROCESSES

We started with an initial proof-of-concept tool by de-identifying a small set of csv files compatible with an Orion EHR data format. Encouraged by the promising framework concept, we are expanding it to be able to support more clinical data set types across several domains.

CONCLUSION

A practical de-identification framework is being developed to guide users who are not necessarily de-identification experts. The process starts from a "raw" data status, and outputs purpose-met "de-identified" data, balancing between utility of data and patient privacy.

The process encompasses:

- Considering the context of the data recipients and suggesting the relevant risk of re-identification.
- Scanning of raw input data to advise ideal attribute types so that desired de-identification methods can be applied.
- Optional re-identification capability with auditing and reports.

We plan to make the framework generic enough so that it can be used not only for Orion Health's data formats but also for other vendors' clinical data. DHBs who wish to de-identify their data can be invited to evaluate this framework and to help it improve.

WHAT MAKES YOUR SUBMISSION UNIQUE?

Our initial investigation shows there are currently no readily available frameworks that exist supporting the end-to-end de-identification process of clinical data.

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ID 852 - DIGITAL HEALTH IDEA

Evaluation of Patientrack (eVitals) In Action @ Waitemata District Health Board

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INTRODUCTION

Conversion from paper based charts to a digital solution is never uncomplicated; we evaluated this process at the largest District Health Board in New Zealand. Paper charts are problematic including inaccurate data recording, loss of information and difficulty locating charts. Paper is clearly problematic in a busy hospital setting, and a shift to digital platforms for various hospital activities is overdue but how do staff perceive these changes?

USE OF TECHNOLOGY AND/OR INFORMATION

The Patientrack (eVitals) software has been implemented at Waitemata District Health Board (WDHB) across all inpatient beds excluding Mental Health. This system facilitates the bedside recording of multiple assessments, activities and vital signs using mobile devices. We evaluated the eVitals project after 12 months with the aim of understanding staff's perceptions of the system and if eVitals was an improvement on paper charts.

IMPLEMENTATION/PROCESSES

Our evaluation used a mixed qualitative and quantitative approach. Perceptions of over 400 staff were assessed using both surveys and focus groups. This generated a large amount of qualitative and quantitative data.

Staff believed eVitals was a significant improvement on paper charts. Strongly agreeing or agreeing that eVitals; improved efficiency 91%, quality of care 88% and time management 82%. 89% of staff prefer eVitals and with only 2% stating they would prefer paper. Robust training and coaching was important, with 97% of participants stating that the eVitals training was necessary and adequate.

Staff perception was one component of the evaluation. Quantitative analysis of observation recording showed 100% compliance with mandated fields, such as a full set of observations and Early Warning Scores for each patient. eVitals in conjunction with a mobile device decreases the time wasted per shift looking for notes by 50% from average of 21 to <10 minutes.

CONCLUSION

eVitals improves efficiency of staff, increases accuracy of clinical records and provides accessible data that was not possible with paper charts. The benefits eVitals provides has a flow-on effect to patients, improving the care they receive in hospital. Listening to end-users, adequate training and the ability to fix issues with the software are important factors in the rollout of clinical software and should not be neglected in the future.

WHAT MAKES YOUR SUBMISSION UNIQUE?

WDHB was one of the first DHBs in New Zealand to implement an electronic observation recording system and the first to formally evaluate the process. Such a system was well received by staff and is a workable, user-friendly solution. Our experience and lessons from this project will help guide implementation of these types of systems for other DHBs in New Zealand.

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ID 821 - DIGITAL HEALTH IDEA

Fail boldly recover brilliantly

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1. NMDHB
2. Filebound

INTRODUCTION

Setting: Nelson Marlborough Health

We had 3 main drivers for wanting to 'systematically reduce the use of paper in our hospitals through a paper-lite approach'

1. A planned new hospital build (Nelson) in about 5 years time
2. A wish to improve the availability of the medical record especially across 2 sites (Nelson / Wairau hospitals)
3. Systematically rationalise the 'whole-of-system' virtual eRecord
4. We planned a 2 phase process along the 'Stop the bleeding, then clear up the mess' principle:

1. Stopping the filing of all new paper generated in the 2 hospitals by 'smart-scanning' into our own 'eRecords' Document Management System (DMS) – 'Front-scanning'
2. Selectively scan entire records based on set criteria designed to maximise the clinical use and benefit from the investment in scanning a full record – 'Back-scanning'

USE OF TECHNOLOGY AND/OR INFORMATION

Technology: Smart scanning software (PsiCapture) and the eRecords DMS (Filebound)

Integration: PAS (Now South Island Patient Information Care System)

Access: Via the HCS South Island Clinical Portal, repurposing a link to access the NMH eRecords.

Challenge: Clinical / end-user functionality across the system for access, searches and audit / coding

Paper – to – eRecords time

Volume

IMPLEMENTATION/PROCESSES

1. We scoped the project (volume, processing capability, accessibility to eRecords)
2. From 4th December 2017 ALL NEW PAPER across both acute hospitals was sent to the Scanning Bureau and processed: Prepare, scan, classify and index, QA -> Publish in eRecords
3. How it went:

1. Much higher volume than we had estimated, both page numbers and document types (all programmed to be recognised individually by the scanner).
2. Discovery of poorly understood clerical / paper process in the DHB resulting in high volumes of paper that is already available electronically
3. Poor clinical engagement initially and poor acceptability of the first DMS chosen
4. Poor preparation of much of the paper pre-bureau
5. Speed and demand affecting team, technology and end users

CONCLUSION

Outcome: We reviewed, re-scoped, engaged better and changed our DMS

Lessons Learned: Engage better, pre-work on the 'floor', and simplify the process.

Next Steps: Systematically reduce the paper (and ePaper) and support a rational 'whole of system' eRecord

WHAT MAKES YOUR SUBMISSION UNIQUE?

No DHB (as far as we know) has adopted a 'Big bang' front scanning approach
as a step one to a systematic journey to Paperlite / Paperless

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ID 869 - DIGITAL HEALTH IDEA

From hand calculations to clinical 'app' - SCIMA : Transforming the way nurses prepare subcutaneous infusions

Scott Crawford[1]

1. Capital Coast District Health Board

INTRODUCTION

Subcutaneous (SC) infusions deliver multiple medications continuously, usually at the patients end of life; in the hospital, hospice or community.

Performing the medication volume calculations manually is a daunting task, often due to poor confidence completing the calculations and making decisions about the appropriate syringe volume, diluent and correctly identifying medication compatibility issues. Anecdotally, high numbers of drug errors occur in the preparation process, often in patients with limited physical reserve to cope with errors. There is no DHB policy mandating the recording of hand calculations, making adverse event reviews difficult.

USE OF TECHNOLOGY AND/OR INFORMATION

Adopting a 'Smart system' approach, a web based application called SCIMA (Subcutaneous Infusion Medication Application) aims to mitigate patient harm events through the automation of the preparation process. After entering the required medications and dosage, SCIMA calculates the medication volumes, diluent volume/type, syringe size and highlights possible medication incompatibilities. Linked with the patients NHI, SCIMA records all information in the form of a printable and recallable 'Preparation Order', essentially a 'How to prepare guide'. A administrator portal allows the medication information underpinning the application to be updated. SCIMA aims to enhance a patient's journey through the mitigation of errors, whilst saving clinicians time in resource pressured environments.

IMPLEMENTATION/PROCESSES

After recent clinical committee approval, a single ward pilot in Wellington Regional Hospital is planned (June 2018). Pre/post pilot audits will assess SCIMA's use in 'real life', its effect on nurse confidence and medication harm events, whilst serving as feedback for further development. Using SCIMA's reporting tools, each 'use' will be reviewed against patient clinical notes, ensuring clinical accuracy of the application.

CONCLUSION

Following a successful clinical pilot, expansion is planned to all DHB clinical wards, and hopefully act as a 'proof of concept' for development of an android/apple tablet version, for hospices and district nurses. SCIMA will be provided free to other DHB's; whilst acknowledging the requirement to remotely update the medication information underpinning the application.

SCIMA's development illustrates a successful link between a real world clinical problem and the DHB's IT development team. Acknowledging the risk with a clinical 'app', its development has required a rigorous safety focus, which has re-defined how the DHB views health related 'apps'. Future integration of this 'calculation app' into the electronic prescribing framework is being explored.

WHAT MAKES YOUR SUBMISSION UNIQUE?

SCIMA optimises a smart system, standardising a common nursing clinical task in an innovative 'one stop' application, useful across a wide range of inpatient and outpatient clinical environments.

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ID 867 - CLINICAL CASE STUDY

Going Digital – is technology deciding for us, the perceived impact on nurses' critical thinking

Sally Dennis[1], Aaron van der Klip[1]

1. Counties Manukau Health

INTRODUCTION

Over the past year, an electronic system has been implemented which automatically calculates an Early Warning Score (NZ EWS) for vital signs (with associated score matched caring), along with other forms requiring calculation and scheduling. During pre go-live conversations there was a perception that the electronic system would take away a nurses' ability to think for themselves. Anecdotal comments have been received including "will the system 'tell' me what do, is this task nursing?".

USE OF TECHNOLOGY AND/OR INFORMATION

The introduction of this technology is meant as an enabler, to provide efficiencies in reducing time spent with a calculator, instead releasing time for nurses' to escalate care where necessary. Ultimately, technology is assisting in the decision making process particularly with the visual data it provides and the ability to view a patient's improvement or deterioration at a glance.

IMPLEMENTATION/PROCESSES

During training, rationale was provided as to the importance of nurses not solely relying on one factor, instead being able to consider the holistic picture of the patient. For example a patient may have an early warning score of three, however with other factors considered, the nurse may elect to elevate concern to a senior member of the team despite the patient having a low EWS score. Speciality nurses, including Clinical Coaches, have the clinical background to provide training for staff with the ability to provide examples where care may be altered based on information at the time and by reinforcing critical thinking.

CONCLUSION

Implementing an electronic system is more than simply teaching health care professions how to enter data. Skills as to how to read the data to make informed decisions in order to escalate care, when perhaps the data does not indicate an escalation is necessary. Nursing requires thinking beyond that of the iPad, and instead, to use the data to enable care based on other factors presented to the nurse at the time.

WHAT MAKES YOUR SUBMISSION UNIQUE?

The uniqueness of this submission presents the importance of a nurses' critical thinking being vital for best patient outcomes, by going beyond the numbers presented to them in an electronic format and by overriding a score to escalate care appropriate for the patient. This presentation provides examples that highlight technology as an enabler and where critical thinking is essential.

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ID 800 - CLINICAL CASE STUDY

Harm event detection: How can we reduce high risk of harm events happening in new zealand primary care?

Helmut Modlik[1]

1. Patients First

INTRODUCTION

HQSC reported in 2017 that 34.7% of NZ hospital patients are harmed by medications, with 29% of that originating in primary care. The Waitemata DHB's "Safety in Practice" programme aims to prevent prescribing-related harm by training GPs to better recognise, prevent or manage the risks around such events. A second, potentially even more effective solution has been developed involving 'big data', sophisticated analytics, and real time alerts – the "Conporto EDM" (event detection and mitigation) service.

USE OF TECHNOLOGY AND/OR INFORMATION

To minimise the risk of treatment harm to patients in primary care, Patients First in partnership with DrInfo, developed and deployed leading edge technology that automatically identifies patients at risk of extreme harm and notifies attending clinicians prior to the patient(s) presenting, to inform their diagnosis and decision-making. The notification(s) includes evidence of the harm event detected, and if required, access to an integrated summary patient record (incorporating data from all available sources).

IMPLEMENTATION/PROCESSES

An in-field trial of the Conporto EDM service took place during March 2018 involving 94 general practices and 152 pharmacies at various locations across New Zealand. The trial targeted the identification and notification of 9 extreme harm events selected by an independent Clinical Governance Group, and operated as follows:

1. GPs received an email notification at the beginning of each day when a patient booked to attend the clinic that day was found to be at risk of an extreme harm event. The notification included a brief description of the harm and a hyperlink to view the patient data supporting the event identification.
2. The GP received the same information in their Patient Management System inbox when the patient presented as part of her/his normal clinical workflow.
3. If further information was required, 'one-click' access was provided to a patient summary record 'Look Up' that presented an integrated view of all the relevant patient data from all sources – regardless of location.

CONCLUSION

Results

100% of Conporto harm event notifications to GPs were successfully sent, opened and reviewed, demonstrating the service operates in a way that fits busy clinical workloads.

All specified harm events were repeatedly detected, and ample quantitative and qualitative evidence generated to show notified clinicians incorporated alerting information into their clinical decision-making, with few false positives evident.

Equity issues may have been signalled by the variation in harm incidence and mitigation levels between practices. This will need further careful analysis to confirm.

WHAT MAKES YOUR SUBMISSION UNIQUE?

Conporto EDM is technically and operationally a world-first. Real-time querying of large numbers of distributed data sets to pre-emptively identify and notify attending clinicians of extreme harm, with the presentation of supporting evidence and a 'virtual integrated summary patient record' to support diagnosis, is without precedent.

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ID 973 - DIGITAL HEALTH IDEA

Harnessing technology to control scabies infestation

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INTRODUCTION

Scabies is a mite that lives exclusively in the superficial layers of human skin. The diagnosis of the condition is problematic, since the appearance of the disease varies and some cases have few symptoms. Scabies is likely to be an important cause of preventable hospital admission and morbidity, with strong links to bacterial skin infection, post-streptococcal glomerulonephritis and acute rheumatic fever. These diseases are also linked with ethnic differences in disease burden. The differential diagnosis of the condition is long and it is often confused with eczema and other dermatoses.

USE OF TECHNOLOGY AND/OR INFORMATION

Permethrin is a drug almost exclusively used for the treatment of scabies. Analysis of prescribing information in South Auckland shows large ethnic differences in rates of prescribing of this drug. Hospital diagnoses of scabies have been strongly linked to admissions with acute rheumatic fever in a cohort study of Auckland children. The true prevalence of the disease remains unknown, and has not been studied for thirty years in this country.

We now have funding to use inexpensive microscopes attached to smartphones so that images may be reviewed by a dermatologist if the diagnosis of the disease is uncertain. This technology exists, but has only been principally applied to the diagnosis of melanoma. Other modalities that are being explored include near infra-red spectrometry, deep learning (neural networks) to classify images, and polymerase chain reaction of tissue samples. Near infra-red spectrometry is near to becoming a consumer level technology with inexpensive units available that interface with smart-phones.

IMPLEMENTATION/PROCESSES

Preliminary funding has been obtained to compare the diagnosis obtained by different health professionals in an early childcare centre where the disease is likely to be prevalent. Experimental modalities such as spectrometry, and teledermatology will be trialled in an effort to improve the diagnosis of the disease.

CONCLUSION

The use of routinely collected health care data has inexpensively helped identify the burden of a disease that contributes to ethnic inequality in health status, yet is very treatable. Emerging technologies may provide useful ways of improving the diagnosis of this disease.

WHAT MAKES YOUR SUBMISSION UNIQUE?

Scabies has been overlooked in recent years as a cause of ill-health. To my knowledge, this is the first focused attempt to improve the diagnosis of the disease using modern technology in New Zealand.

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ID 976 - DIGITAL HEALTH IDEA

Health + Care – right place, right time, right resource, right tool (patient portal)

Jeremy Young[1]

1. Cerner Corporation

INTRODUCTION

"There's an app for that". There has never been a truer statement. The reality of technology presence in society today is undeniable. By 2020 it is estimated there will be 4 devices for every human on the planet.

Health and care is no different than the technology industry – the need to innovate and provide resources to the patient community is imminent. Patient engagement is a strategic initiative in this space to assist with community engagement, coaching, communication, and self-help while the patient is not within the four walls of the health system.

USE OF TECHNOLOGY AND/OR INFORMATION

An electronic health record (EHR) is a fantastic foundation to providing care within the clinical setting. However, engaging and treating patients only when they are sick will not address the increasing challenges of connecting with the "on-the-go" patient and those perplexed with barriers of; chronic conditions, low access to services, challenges of scheduling time away from work, etc.

A patient portal was implemented to assist with these barriers. This portal also enabled focus on not only those citizens that are unwell, but also assist those who are well maintain their health status.

Patients are now able to:

- View medical information from EHR
- On any internet enabled device; native iPhone and Android apps as well
- Quickly review gaps in care
- Add and update intake information, such as; problems, allergies, medications, medical history, and more
- Securely message with care
- Schedule and request appointments
- Schedule care to address gaps in care plan with health services
- Video visit appointments
- Connect personal devices (such as blood pressure cuffs, glucometers, etc.)

IMPLEMENTATION/PROCESSES

The patient portal was implemented on top of the existing EMR framework and augmented with select functionalities to power the citizen community with enhanced capabilities for self-help. The health system was able to select which features were enabled and presentation style to the citizen;

- Time delay (or not) on clinical results
- Which appointments are able to be scheduled online by patients
- Branding portal to enable localization to the health system public domain

CONCLUSION

The patient portal extended benefits to health system, clinical care team, and patients.

- Roughly 50% reduction of no-call, no-show appointments
- Patients enabled to select optimal time for appointment thereby increasing likeliness to attend
- Eliminate patients presenting for some post-surgical evaluations (rotator cuff)

o Patient now able to log into a Video Visit with clinician remotely to have the same 5-minute interaction with clinician

- 541 physician hrs/yr in time saved
- 867 staff hours/yr saved
- $5,200 saved in postage

WHAT MAKES YOUR SUBMISSION UNIQUE?

Cerner has a client community of over 1500 clients using the patient portal which continues to push the boundaries of the patient portal functionality, extensively.

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ID 812 - DIGITAL HEALTH IDEA

Health Care Home – the game changer – tech enabled care

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1. Pinnacle Ventures Limited

INTRODUCTION

The traditional health system needs to find more ways to improve its collective consumer experience. Brilliant siloed services are too often let down by the inability to create the linkages between themselves, the patients and other services.

In primary care this is highlighted by the traditional care model which was designed to respond to patient initiated acute care needs and based around transactional focused financial subsidies.

How can the system step beyond the current constructs? The Health Care Home (HCH) emerging from Pinnacle and now being adopted nationally is now delivering sustained and scaled system benders..

USE OF TECHNOLOGY AND/OR INFORMATION

Current systems remain largely service silos of information rather than those of an ecosystem arising from the convergence between traditional and non-traditional services, with a more consumer-based focus. Largely provider and funding orientated they often restrict patients and providers by not empowering access, sharing and integration of core health information. Patients are increasingly expecting their healthcare to be as seamless and convenient as online shopping.

The HCH implementation has led to the development of advanced cloud-based patient health information systems. These systems are emerging as key building blocks for the next phase of HCH, scaled implementation and will be key disruptors as they equip patients with their own health record capsules that are system, provider and service agnostic.

IMPLEMENTATION/PROCESSES

There is now strong evidence of the efficiency benefits of the HCH arising from Pinnacle as independently verified by Ernst & Young (EY), in April 2018.

- 20% reduced ASH – via a multiple logistic regression model, the HCH practices have significantly lower rates of ambulatory-sensitive hospitalisations (ASH),
- 14% reduced ED – HCH practices have significantly lower rate of emergency department (ED) presentation,
- 24% reduced ED rates for Maori - Maori ED incidence rate ratio (IRR) of 0.76,
- 32% reduced ED rates for over 65-year old's - Lower ED attendance is most pronounced for elderly patients, suggesting that a significant proportion of acute need is being prevented or dealt with in the community by the HCH,
- 11-13% lower ASH and ED for quintile 5 - ASH and ED rates are particularly pronounced in patients living in areas of highest deprivation,
- The rate of general practitioner consultation at HCH practices was lower, while the rate of nurse consultation was higher compared to control practices,
- 12% highter rates of virtual care,
- Cost neutral to slightly positive financial positions for HCH practices,
- High level of consumer satisfaction in convenience and consultation,
- Higher levels of staff satisfaction in sites that have fully implemented HCH post the initial establishment phase.

CONCLUSION

These results are significant and at a macro level out perform any other current systematic intervention within the NZ health sector.

WHAT MAKES YOUR SUBMISSION UNIQUE?

What else is having this kind of impact?

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ID 817 - DIGITAL HEALTH IDEA

Health Coaching: Digitally enabled continuous remote care

Hamish Franklin[1]

1. Green Cross Health

INTRODUCTION

With significant increases in patients diagnosed with long term conditions (LTCs) research has addressed the pertinent issues of how to improve self-management; various solutions have been implemented with varying success. Of these, health coaching has been shown to be an effective approach, particularly when utilising mHealth capabilities such as via 'apps'. Health coaches help patients gain the skills, motivation, and plans to manage their health and are able to help build patients' self-efficacy to self-manage.

USE OF TECHNOLOGY AND/OR INFORMATION

- Green Cross Health created a health coaching 'app' for patients with LTCs. Patients are able to create health goals and action plans, see progress to their goals using established 'health measurement' tools, and have continual interaction with their health coach via the chat function. Coaches support patients in their engagement with the app.

IMPLEMENTATION/PROCESSES

The app was developed in collaboration with a health psychology specialist. The goal was to improve self-management whilst simultaneously improving self-efficacy to carry out management tasks. The app is being utilised in three Green Cross Health clinics (Kamo, Tikipunga and Kerikeri). Patients referred for coaching have an initial consult with the coach and from here, coaching is done over the app where patients are supported for 3 months as they work towards achieving health goals.

CONCLUSION

Early analysis of health coaching found for those patients focusing on weight loss, as many as 60.9% of the patients lost weight with an average of 5.4kg per patient. In-keeping, 78.8% of the patients reported an improvement in their health condition. Patients also felt their commitment (74.1%), knowledge (66.7%) and lifestyle changes to manage their health condition (81.4%) improved as a result of health coaching.

These results suggest the efficacy of health coaching both from an objective view point (weight loss, which is a significant issue for LTCs and general health management) and subjectively from patients. This is important if we consider issues of motivation and adherence and their impact on self-management and uptake of health services.

WHAT MAKES YOUR SUBMISSION UNIQUE?

LTCs require continual medical care and daily management on the part of the patient. Patients are often prescribed management tasks, and told to change their lifestyles accordingly; but after the brief doctor appointment, they are typically left to their own devices to self-manage. It is not surprising that patients often manage poorly and we continue to see declining health and increases in health care consumption.

This is a problem that is well recognised, however, there exists very little to 'fix' it, or reduce the burden on health expenditure. Health coaching is one such way. Uptake of simple mHealth technologies (the app) coupled with a health coach has led to significant health improvement (notably weight loss) and an improvement in patients perceptions of their health and commitment and ability to self-manage.

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ID 895 - DIGITAL HEALTH IDEA

Health Information Security in New Zealand - survey and next steps

Faustin Laurentiu Roman[1], Franz Coreth[1], Johannes Haidvogl[1], Nicolae Petre[1], Elvin Sindrilaru[1], Mike Gollop[2] and Helmut Modlik[3]

1. Medical IT Advisors
2. Conporto Health
3. Patients First

INTRODUCTION

In 2017 the WannaCry ransomware attack affected the UK NHS, with many doctors forced to turn away patients and cancel appointments. Numerous public reports found 2017 to be another "worst year ever" in data breaches, and this trend seems to be in direct competition with the increased digital transformation of the health sector.

In New Zealand, journalists reported in July 2018 that the Bay of Plenty District Health Board has been forced to protect itself from cyber-attacks "as many as 10 a second", with the DHB CE stating "this is putting patients at risk". Same day coincidently, Singapore broke the news that it has suffered its "most serious" data breach affecting 1.5 million patients, including its Prime Minister and other Ministers.

New Zealand Health Information Security Framework (HISF) standard - HISO 10029:2015 - is a timely and appropriate response to the healthcare security context. Yet, HISF compliance requires time, skills and resources that many small and medium health organisations do not have, leading to a challenging, risky situation for their healthcare services.

For this, in 2017 we proposed a simplified journey for HISF compliance, structured in 3 simple steps:

1. Self-Assessment – the scope of this submission
2. Internal and External Assessment
3. Continuous Improvement

For each of these steps, we have developed and implemented tools that are freely available on the Medical IT Advisors website (www.meditadvisors.com).

USE OF TECHNOLOGY AND/OR INFORMATION

Medical IT Advisors HISF online survey provides a simple self-check on readiness to comply with HISF, covering minimum information security requirements relevant to any type of healthcare organisation, e.g. GPs, Dentists, Allied Health, PHOs, DHBs, or their IT service providers.

Main features and benefits of this self-assessment tool:

- Web-based, mobile friendly, simple survey format
- Built-in help with details for each question
- Generates automatically qualitative estimates of a "gross" risk, a visual awareness measure
- Generates a spider chart that measures the performance (alignment) in 5 Information Security areas: Organisation, People, Policies, Processes and Technology
- Optionally, a PDF report can be emailed with improvement advice for each identified gap
- Based on all anonymised answers, statistics are generated representing the community baseline
- Each respondent can compare their performance against the community baseline
- The survey can be repeated in time allowing for an easy benchmark between the last assessment or the community baseline, showing continuous improvement and assurance

IMPLEMENTATION/PROCESSES

We designed specific templates and processes for the HISF self-assessment tool to minimise completion time (5-10 minutes), using non-technical terms and references familiar to the sector inspired by the Patients First GP ICT Security Checklist.

The intent of the assessment is primarily cybersecurity awareness and to review basic security controls in 5 areas: Organisation, People, Policy, Process and Technology. Implementing most of the recommendations and controls may not require significant investment while mitigating major risks related to health information security, e.g. secure platforms to share medical information, are available at no cost.

For the web application implementation, we used open source LimeSurvey software and custom plugins.

The application is hosted in New Zealand and can be accessed freely online here:

https://ask.meditadvisors.com/index.php/967926?newtest=Y&lang=en

CONCLUSION

We received positive feedback from various organisations and we are continuously improving the tool.

We will present the statistics to date and our interpretation of the results – an initial snapshot of the health information security in New Zealand, the good, the bad and the ugly.

The HISF survey could be used nationally for continuously assessing the sector security posture, identify capability gaps and support the information security journey of all organisations in the health sector.

We are making a call for action to all organisations, small or large, to join our initiative, complete the survey, and to openly collaborate to improve information security in the New Zealand health sector.

WHAT MAKES YOUR SUBMISSION UNIQUE?

To the best of our knowledge this is the first online New Zealand health information security self-assessment tool, raising cybersecurity awareness with specific guidance, open statistics and benchmarks relevant to the New Zealand health and disability sector.

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ID 876 - DIGITAL HEALTH IDEA

Identifying pressure injuries sustained by ACC serious injury clients

Sean Bridge[1], Tahia Eaqub[1]

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INTRODUCTION

Pressure injuries can negatively impact both the individuals and those around them and can lead to serious health complications or even death. As pat of ACCs pressure injury stratergy, ACC undertook an investigation to identify serious injury clients who show evidence of having a pressure injury. The term 'serious injury' is a classification ACC created for people who will have a lifelong relationship with ACC due to the nature of their injury. Examples include damage to the spinal cord or brain.

Currently pressure injuries are not recorded in a consistent manner. A tool was developed to search for pressure injuries in unstructured ACC claims data such as medical notes, emails and document descriptions. This enabled a large scale automated search of claims to identify those that have involved a pressure injury.

USE OF TECHNOLOGY AND/OR INFORMATION

The search process was split into two parts.

Phase 1: Converting documents into searchable text

- Obtained list of documents associated with all serious injury claims with creation dates between 1 July 2014 and 30 June 2017
- Downloaded ~177,000 documents from ACCs system EOS as PDFs
- Converted PDFs into .png files – this conversion allowed us to use existing R software on the ACC system and process the documents on multiple machines. This sped up the process significantly and allowed storage of the readable documents in a secured and accessible place on the ACC system.
- Convert each .png into a searchable .txt file

Phase 2: Identifying pressure injuries

- Ran a program that read through the txt files and selected all excerpts which contained key words and phrase related to pressure injuries.
- Excerpts were manually assessed for evidence of pressure injuries
- Files containing verified evidence of pressure injuries were linked back to the claim number.

CONCLUSION

Analysis of the incidence of pressure injury in the paraplegic/tetraplegic/spinal cohort shows that:

- by gender the incidence is similar but slightly higher for males at 43% compared to 40% for females,
- clients aged between 21 and 30 have the highest proportion of pressure injuries at 55%. Clients aged under 20 and over 80 had the lowest incidence of pressure injuries at around 35%,
- 55% of Maori and 45% of Samoan had pressure injuries, making them the highest proportion of pressure injuries by ethnicity.

WHAT MAKES YOUR SUBMISSION UNIQUE?

The cost of pressure injuries to serious injury clients is estimated at $40 million per annum. Ongoing work will identify costs more accurately.

This information, and further work we are doing, will be used to inform effective current and future prevention, mamagment and treatment strategies for pressure injuries.

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ID 868 - DIGITAL HEALTH IDEA

Immunisation Catch Up Calculator: A practical insight into growing a digital concept into a working platform

Jillian Boniface[1], Leanne Liggett[1]

1. Southern District Health Board

INTRODUCTION

Winning the New Ideas category of the Clinicians Challenge in 2017 with our Immunisation Catch Up Calculator proposal was an exciting opportunity. However, we were quickly faced with the complex reality of being IT illiterate, while attempting to complete a feasibility study for the development of a fully-fledged national digital tool.

We needed friends; and fast!

This is our journey navigating an unknown world.

USE OF TECHNOLOGY AND/OR INFORMATION

Our intent was to streamline a complex and currently highly manual process to:

- enable an automated mapping of overseas vaccination history into the local Schedule
- develop a Catch Up Plan and
- upload the history into the National Immunisation Register (NIR).

IMPLEMENTATION/PROCESSES

To understand the actual problem from a national perspective, many conversations were required. We spent the first third of our year undertaking formative evaluation so that we could revise and validate our Problem Statements.

During this time, reality clashed with our dream. It became quickly apparent that the current IT platform was too old and struggled to support existing requirements: and while a new platform is on the horizon, there is no Ministry of Health budget currently allocated for an upgrade.

However all was not lost. Our idea of building the Catch Up Calculator has been embraced by the end users, as they are fully aware of the current burden of the manual process. Our formative evaluation showed the variance between regions; how they operated, who they asked for help and ongoing data glitches.

Our intent to design and pilot a tool became reliant on a trans-Tasman relationship and the supply of the Australian algorithm – creating a New Zealand tool from scratch was not seen to be fiscally and clinically prudent.

CONCLUSION

Our journey is ongoing, but appears to be on track. Key to our positive progress is engagement with not only the clinical sector, but more importantly those who can actually make it happen at a national level. Sometimes a reality check is necessary.

WHAT MAKES YOUR SUBMISSION UNIQUE?

Sometimes thinking outside the square really does make a difference. As non IT people, having won an IT prize, we experienced people taking an interest in our story. This has translated into practical support to help us realise a pragmatic outcome, even though the end result may not be what we initially envisaged.

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ID 986 - CLINICAL CASE STUDY

Impact of Electronic Prescribing on Medication Administration Errors

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INTRODUCTION

Medication administration is a complex, multifactorial process with multiple opportunities for error. Only approximately 2% of administration errors are intercepted, however it is the stage where the greatest percentage of harm occurs. Since 2012 several New Zealand District Health Boards have rolled out, or are in the process of rolling out the ePrescribing and Administration system MedChart with the aim of improving quality of care, increasing efficiency and decreasing medication errors. With the on-going rollout of ePrescribing throughout the country it is pertinent to understand the impact of an electronic system on medication administration, and to investigate if the system is improving medication error rates and explore the new errors that may be created with this new process/workflow.

USE OF TECHNOLOGY AND/OR INFORMATION

The ePrescribing system being implemented in New Zealand offers 24-hour multi user access. It has basic clinical decision support for allergies, duplicate therapies, medication interactions, dose ranges and rules. It allows prescribing, administration and pharmacy review to be recorded in one system.

IMPLEMENTATION/PROCESSES

In 2014 the electronic prescribing system MedChart was implemented into two general medical wards at Taranaki Base Hospital. A sample of medication charts – 51 National Medication Paper Charts (616 prescribed medications in total) pre MedChart implementation and 51 electronic medication charts (688 prescribed medications in total) post MedChart implementation were selected for a manual chart audit. Error rates and types were recorded and compared pre and post implementation of MedChart with the main focus on medication administration errors.

CONCLUSION

The audit found that there was a higher rate of medication administration errors in the paper charts compared to the electronic chart. Error types varied between the paper and electronic systems. Healthcare is changing and evolving with the introduction of new technologies. ePrescribing systems aim to reduce errors and improve quality of care. It is vital to constantly evaluate systems and technologies to be confident that safety is improved and that they are not contributing to patient harm.

WHAT MAKES YOUR SUBMISSION UNIQUE?

There is limited published data on the impact of ePrescribing on medication administration with minimal New Zealand based information. Nurses are the last line of defence against medication administration errors and it is important to understand the impact of a new electronic system on medication administration.

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ID 985 - DIGITAL HEALTH IDEA

Impact of Games on Digital Health – An Example

Benjamin Dunn[1]

1. Swibo

INTRODUCTION

If you're unlucky enough to get injured, but lucky enough to live in New Zealand, you're probably headed to your nearest physiotherapist. They will assess your injury, provide some treatment, and assign you a prescription of exercises to help you recover properly. Unfortunately, studies have shown that only 35% of you are actually going to do those exercises, leading to poor recovery outcomes for most of us, such as ongoing pain or movement restrictions, and re-injury.

Swibo helps people do those exercises that help you recover, get healthy, and stay healthy, using video games. We encourage people through fun, engagement, and built-in measurement of progress. This same technique can be applied to additional forms of exercise and physical therapy and our goal is to make any type of rehabilitation fun and rewarding to help people recovery properly and improve quality of life while we're at it.

USE OF TECHNOLOGY AND/OR INFORMATION

Swibo uses software to turn repetitive and boring exercises into fun and exciting games. Our first product, Swibo Tilt, targets balance training to help people recover from and prevent some of the most common injuries like ankle sprains and ACL tears. We take advantage of technology already available, using a smartphone app to measure the user's movements on a custom balance board, and a computer program to turn those movements into controls for the games.

IMPLEMENTATION/PROCESSES

We built the Swibo Tilt system in collaboration with physiotherapists, athletes, and sports trainers, starting with the games. We soon incorporated balance tests to provide objective tracking of balance as well as the gamification of the training. Response has been positive and we're currently providing Swibo Tilt to customers in New Zealand, Australia, and Europe.

CONCLUSION

We've shown that using games in rehabilitation can have a very real impact on people's experience of physiotherapy, people's compliance with exercise, and by extension their recovery. We believe that without the patient's active engagement in treatment, recovery can be severely limited, and games present an opportunity to effectively engage patients.

Next we will further examine the impact on recovery outcomes that gamification has for our current balance training system, then apply the technology to further forms of exercise to provide a suite of options to help anyone exercise and recover properly.

WHAT MAKES YOUR SUBMISSION UNIQUE?

Swibo combines entertainment and healthcare in a meaningful way to provide real outcomes and quality of life improvements. Swibo has applications both in clinics and as a remote tele-health solution and is already being used as both.

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ID 926 - CLINICAL CASE STUDY

Innovation and the cost of failure

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INTRODUCTION

In 2015 the Waikato DHB proposed a whole of community change to delivery of clinical services with the intention of wide distribution of health knowledge and assisting the population with health decisions. This was a partnership with an American App developer HealthTap. The trial ran for 2 years after which the Board made the decision to not continue with the change with HealthTap.

USE OF TECHNOLOGY AND/OR INFORMATION

A software as a service application was adapted in conjunction with HealthTap, the app enabled video and text based conversations, as well as storage of patient health information and the ability to provide checklists and guide treatment. The application had a patient and clinician aspect allowing patients to contact their clinician and access health information and allowing clinicians to communicate securely with other clinicians as well as patients. The application also allowed for continuous medical education points to be accumulated for users.

IMPLEMENTATION/PROCESSES

A whole community approach was taken with roll out to as many community members as possible using secure identification processes to link the patients with their NHI and information within their record.

Every independent provider in the DHB was offered the opportunity to join the Clinician app and become involved in offering their patients consultations by video or text. A fee afterhour's service was provided to patients who were registered on the system.

A key challenge was that the adaptation of the technology took longer than was intended and when it was completed other factors, relating to change management, meant that the overall change to clinical service delivery was unsuccessful.

CONCLUSION

This project was very brave and fraught with both technical and political issues including questions regarding procurement and engagement, all of which played out in the press. There were multiple lessons learnt in this journey and the District Health Board remains committed to the concept of supplying patients care closer to home and smarter.

WHAT MAKES YOUR SUBMISSION UNIQUE?

This is summary of a 2 year project which gives the opportunity for other providers to learn from the challenges which were faced with the attempt at wide spread clinical practice change and software as a service implementation to create a mobile telehealth/virtual healthcare service.

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ID 819 - DIGITAL HEALTH IDEA

Integration is doing more with less – how the right integration strategy can enable efficiency and innovation in healthcare.

Scott Bennett[1], Jaco Saunderson[1], Gordon Inkson[1]

1. Datacom

INTRODUCTION

Patient journeys span many realms. Health information has to span many organisations, applications and networks. This broad span has meant integration has always been at the forefront of Health Informatics. However, the pace-of-change is accelerating in health-care - as it is everywhere – while funding is reducing. How can health-care providers optimise their investment in integration in this high-speed/low-spend world? For answers, we can look to the wider business and technology worlds.

ENABLING ECO-SYSTEMS

All-encompassing, monolithic systems running on heavyweight infrastructure are an expensive option, risky at the point of migration and can lock providers into a single model of healthcare provision.

The alternative "eco-system" model is frequently proposed as an alternative. Organisational boundaries are less significant and individual applications are treated as components or "specialist tools" achieving a particular outcome. Integration – APIs, messages, event-models, workflows – can model the real world, calling on those components as needed. In the eco-system workflows take place across the collection of components, APIs and capabilities that are integrated.

However, a healthcare eco-system is not something that any individual organisation can achieve in isolation. How can the healthcare organisations prepare themselves for a possible, future eco-system while still achieving what they need to internally from applications and integration?

INVEST IN IDEAS, AGILITY AND PEOPLE

Meeting short-term objectives without compromising a longer-term eco-system - is a challenge we have seen many times before. Investing in the right things for your internal integrations will benefit an eco-system later. Architectures, practices and strategies to support lean, agile integrations will also help you participate in a, growing, evolving, adapting eco-system.

Invest in a Technology-Agnostic Architecture. Cloud, containerisation/serverless, micro-services and subscription/consumption licensing all mean that technology and applications can change rapidly at low cost. An architecture that traverses those worlds will outlast specific technology implementations.

The Critical Architecture Artefacts are Models and APIs. The architecture should generate a canonical information model or multiple domain models to represent the real-world entities in play; it should cover event models that describe processes for the delivery of healthcare. Those models can be expressed as APIs – resources with attributes and methods that become the language of exchange for processes that span systems. Integration – regardless of tech – can then become about the interplay of models expressed through API calls.

Lean and Agile. When models and APIs are expressed independent of applications, technology platforms or projects they are purely abstract notions. To become useful the models require implementation. There is risk that agreed models and APIs won't support requirements or that they are altered in implementation. In addition, the real world itself is constantly changing making models obsolete. So, it is imperative in implementation that we commit to the least amount of effort and lowest waste (lean) and are ready to change easily (agility). The proposed architectural structure already supports being lean and agile by generating meaningful low-level building-blocks (the modelled resources/APIs). This extensibility can be extended by layering APIs – System – Process – Experience. Other key tools to support agility are Agile development approaches and automation like Continuous Integration/Continuous Deployment through to DevOps.

The technology-agnostic architecture and leand, agile implementation practices allow integration work to readilyt adapt to multiple technologies. You might begin by wrapping existing HL7 message flows with

some FHIR APIs and then gradually increase the API breadth to cover other domains. This could initially be implemented in legacy technologies but slowly extend into containerised micro-services/serverless.

Being Lean and Agile is not a short-hand for reduced discipline and rigour. The critical cross-cutting concerns in the health sector around security and privacy are fundamental.

Standards and Collaboration. Working with trusted partners in the sector helps to ensure the interoperability of systems and brings a wider set of perspectives to the specific problems you're trying to solve. Involve as many stakeholders as possible and work collaboratively when you can. Standards help in this collaboration but only when the process is extensible and lightweight. This emphasis on collaboration and agreement (including standards) applies to both architecture and implementation.

CONCLUSION

To maximise the value you get from from integration invest more in the underlying ideas and practices, and less in specific tools and technologies. Recognise that change-at-pace is the reality and ensure that your architecture and implementation practices can deal with that. Healthcare matters and provides an opportunity for greater collaboration and unification around standards and collaborative offerings.

WHAT MAKES YOUR SUBMISSION UNIQUE?

This submission draws on the authors' broader experience – outside healthcare – to make recommendations that apply in the health-sector and address specific concerns in health care around rapid change and scarce resource by focussing on simple approaches and practices rather than expensive tools and technologies.

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ID 930 - CLINICAL CASE STUDY

Inter-facility Videoconference Handovers: Hospital Reablement Services and Aged Residential Care Facilities

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1. ADHB
2. ADHB and WDHB

INTRODUCTION

The literature on handovers for patient transfer from hospitals to aged residential care facilities shows suboptimal and delayed communication during the transfer of care process which leads to miscommunication-related adverse events, readmissions, duplication of services and patient dissatisfaction.[1] [2] [3] [4] [5]

Standardised patient-centred bedside handover to transfer accountability and responsibility of patient care is widely considered to increase accuracy and timeliness of information.[6]

In ADHB, handovers for patients transferring to aged residential care facilities are completed by a phone call with no patient/whanau contribution during the handover. This may be a barrier to effective handovers. Our national Health Strategy promotes patient involvement in all facets of their care.

The aim of this initiative is to enhance the quality of inter-facility handovers through patients/whanau participation and early adoption of video conferencing technology.

USE OF TECHNOLOGY AND/OR INFORMATION

To improve handovers to aged residential care, video conference technology is used in handover process with clinicians, patient and whanau involvement. This enables clinicians to provide patient-centred continuity of care, reduce care fragmentation and enhance satisfaction and quality of care. [4]

Video conferencing has been successfully used in the community through a plethora of "telehealth" initiatives for the purpose of direct patient assessment, evaluation, and medication administration management. Although never used in handovers, the multi-sensory output and real-time quality of videoconferencing technology[4] encourages patient/whanau involvement in inter-facility handovers.

IMPLEMENTATION/PROCESSES

The project has engaged a small group of aged care facilities aiming to have all patients discharged from the Reablement Service wards handed over by video conference. Eligible patients and whanau are formally invited to participate in the video handover conference. A standard operating procedure (SOP) has been developed to ensure consistency of delivery. The aged residential care facility participants in the project are encouraged to manage cost by using a variety of existing technology with audio and video capabilities including laptops, tablets/iPads and mobile phones.

CONCLUSION

A qualitative summative evaluation will be completed in November 2018. It is expected it will show evidence of patient-centred handovers, improved accuracy in handover information, enhanced patient and whanau experience by decreasing transfer-related anxiety and foster strengthened inter-facility relationships. The challenges of this initiative will be discussed. It is envisioned, when the project transitions to business as usual, it can be expanded to involve all team professionals in video handover conferences so aged care residents can benefit from interdisciplinary care team approach.

WHAT MAKES YOUR SUBMISSION UNIQUE?

This is a nurse-led initiative showing a pioneering use of technology to achieve positive outcomes for patients, as part of our service commitment to improve patient and whanau satisfaction and patient-centred care.

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ID 801 - DIGITAL HEALTH IDEA

Interpretable Machine Learning for Healthcare

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INTRODUCTION

The "black box" metaphor is commonly used to refer to the lack of understanding of how modern machine learning systems make decisions. Researchers are working actively to remedy this situation which is especially problematic in healthcare where legal accountability and ethics have to be taken into account in the decision-making process. Consequently, the industry cannot yet fully benefit from this new generation of predictive models which have proven to be highly performant. Our project aims to build this interpretability capability while taking into account clinical, legal and commercial requirements.

USE OF TECHNOLOGY AND/OR INFORMATION

Leveraging the python data science stack and open data, we are exploring how state of the art machine learning models (ex: ensemble of decision trees, deep neural networks) could 1) be audited by clinicians; and 2) conform to commercial and legal relevant frameworks such as the European General Data Protection Regulation and its right to "meaningful information about the logic involved" in automated decisions.

IMPLEMENTATION/PROCESSES

Our project is a spin-off of an internship which purpose was to deliver interpretability tools around a readmission risk predictive model. We are working on both, productionizing the interpretability techniques already explored into a software, as well as compiling various use cases into a library of explainable predictive models for healthcare.

CONCLUSION

Our preliminary work showed that those techniques deliver useful insights to answer practical questions, globally or for a particular patient, in the context of the readmission risk. We still need to explore how they can be applied to other use cases and to understand if those insights are enough to win clinicians trust and to comply with the relevant legal and commercial frameworks.

WHAT MAKES YOUR SUBMISSION UNIQUE?

Health is reaching a point where machines are more accurate than humans, or at least as accurate but with less effort, in more and more applications. However, accuracy is not enough. Clinicians, governments, and patients are unlikely to accept accuracy at the expense of valid explanations – and therefore they will sacrifice predictive accuracy, and the corresponding health benefit opportunities. This work seeks to bridge that divide, bringing interpretability to the machine learning algorithms, building trust in systems, and ultimately allowing the adoption of more sophisticated, and more accurate models.

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ID 981 - DIGITAL HEALTH IDEA

IT Connectivity to share an Advance Care Plan (ACP) across Organisations whilst ensuring a Patient Centric Approach

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1. Hauraki Primary Health Organisation
2. Manage My Health

INTRODUCTION

ACP enables patients to discuss and express their preferences for future healthcare and end of life care. The ACP concept was introduced internationally in the1980s and is now a focus within the New Zealand Health Strategy.

The challenges encountered with the paper based ACP has impeded timely access and the ability to share consistent information across different clinical care settings in New Zealand.

USE OF TECHNOLOGY AND/OR INFORMATION

The aim was to develop a truly patient centric approach to ACP that would empower patients and be seamless and fully interoperable across primary and secondary settings.

Hauraki Primary Health Organisation (HPHO), Manage My Health™ (MMH™) and Waikato District Health Board staff consulted and worked with the national and regional ACP steering groups. Also involved were representatives from Pinnacle Midlands Health Network, Hospice Waikato, St John and NGOs.

IMPLEMENTATION/PROCESSES

Manage My Health™ provided the design to accommodate the requirement for interoperability across primary and secondary care and worked closely with the technical staff at Waikato DHB.

May 2018

- Beta testing of the dynamic ACP form, via MedTech and Evolution access to Manage My Health in three Hauraki PHO practices
- Dynamic ACP form access provided to all HPHO practices
- Development work to provide patients direct access to their ACP via the Manage My Health™ Patient Portal for creation, editing or suspending
- High Level Design for the Waikato DHB Clinical Workstation link to the primary care Shared Electronic Health Record. This enables access for DHB clinicians and St John

June 2018

- Include changes from beta testing feedback in next version
- MMH™ Patient Portal testing in anticipation of the end of June release date

August 2018

- Other Practice Management Systems to be included in process e.g. Indici
- Enable other organisations, for example hospices; St John; elder care services, to access the dynamic ACP form via the MMH™ secure website and/or the Waikato DHB Clinical Workstation
- Clinical Workstation link to Shared Electronic Health Records (SEHR) completed

CONCLUSION

This is a wonderful piece of work completed in partnership with primary and secondary care to the benefit of patients and clinicians alike.

WHAT MAKES YOUR SUBMISSION UNIQUE?

This is the first Advance Care Plan available for patients, clinicians and other staff participating in the care of the patient that is presented in a dynamic format. It is version controlled, has strong audit trails, is secure and

meets the brief to be patient centric. It provides the patient with ownership and control of their plan.

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ID 908 - DIGITAL HEALTH IDEA

"It's Michael, not Mary!" Accommodating transgender clients in male/female laboratory information systems.

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INTRODUCTION

Laboratory information systems (LIS) record a patient's sex so that male and female reference ranges can be applied. Most current LIS are unable to present test results from transgender individuals in a meaningful way that can be easily interpreted by clinicians. Furthermore, confusion around the patient's sex can lead to sample rejection, or delays in test results. As transgender individuals undergo sex transition they have increased need for healthcare services with unique clinical and diagnostic requirements. For these reasons, it is important that health information systems, including the LIS, accommodate gender diversity.

USE OF TECHNOLOGY AND/OR INFORMATION

Waitemata District Health Board, in conjunction with Sysmex, are designing an electronic test request form that can capture 1) sex assigned at birth and 2) gender as an optional category. If gender is captured, and is different from the sex assigned at birth, then sex-based registration and order rules would not apply. This would allow, for example, males to have pregnancy tests. For analytes such as haemoglobin, where there are separate male and female ranges, ideally both male and female reference ranges would populate. However, due to current limitations within the system, an interim working solution is to have no reference ranges displayed. Implementing this system would allow laboratory tests on transgender individuals to occur seamlessly, provide clinicians with more information, reduce the opportunity for discrimination, and give the transgender group greater visibility in healthcare.

IMPLEMENTATION/PROCESSES

Developing this project has revealed inconsistencies about the appropriate categories to use for capturing gender identity, confidentiality issues around having gender identity permanently recorded in electronic health records, and limitations in the LIS for populating meaningful reference ranges. Development of this project is ongoing; however, it has raised awareness within the laboratories about how to correctly perform tests for transgender clients.

CONCLUSION

The LIS receives most of its demographic data from PiMs (patient information management) and the NHI (National Health Index) system. Therefore, this project uncovered a wider problem- that most health information systems are currently unable to accommodate transgender individuals. Health IT systems should be upgraded to move forward with society's changing understanding of gender identity.

WHAT MAKES YOUR SUBMISSION UNIQUE?

Gender inclusiveness in Health IT is a unique topic that has received limited advocacy. As I have a good understanding of laboratory systems, gender identity, and the wider healthcare picture I can use this knowledge to be solution-focused and implement change.

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ID 940 - DIGITAL HEALTH IDEA

Keeping current: The South Island Perspective on Staying at N-1

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1. Canterbury DHB

INTRODUCTION

From a software perspective N-1 is the latest version of software, minus one. The notion that avoiding regular software updates will save money is a misconception. Avoiding upgrades will ultimately cost more and when upgrades are finally undertaken, they will be much more difficult.

Canterbury DHB, hosting on behalf of the South Island, has engaged with Orion Health in a strategic partnership, a corner stone of which is the commitment to stay at N-1 for their suite of solutions.

USE OF TECHNOLOGY AND/OR INFORMATION

Orion Health is continuously developing and enhancing new and existing products. By engaging in a strategic partnership with the vendor, the South Island has access to new features and enhancements which increase productivity and maximise the performance of the applications.

Key benefits of staying at N-1 include reduced bugs, increased performance, improved functionality, improved support (requests for fixes are easier to complete in the latest and greatest). In addition, it is easier feedback into the development for future enhancements when on a newer version of the product.

IMPLEMENTATION/PROCESSES

One key factor that empowers the South Island to stay at N-1 for their Orion Health products is rigorous planning. At the beginning of the year the two organisations sit down together to meticulously map out the upgrades for the year to come.

The organisations plan for four major releases per year, following an agile approach. The Product Owner is responsible for scheduling in the upgrades and ensuring interdependencies are identified.

CONCLUSION

There is no one 'right way' to manage complex health IT projects. However, there have been several key learnings from staying at N-1. The first is that a 'little and often' approach is necessary. There needs to be a clearly defined release process and a structured, cohesive approach to migration between environments. Through testing is critical. Perhaps most important is a commitment to constantly inspecting the process and being prepared to adapt.

Avoiding upgrades increases the risk of falling behind on supportability of operating systems, thereby increasing security and performance risks. Staying at N-1 mitigates these risks.

WHAT MAKES YOUR SUBMISSION UNIQUE?

The N-1 approach challenges the common misconception that organisations should avoid regular upgrades.

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ID 894 - DIGITAL HEALTH IDEA

Leveraging technology to prevent falls – smart exercise equipment makes a measurable difference

John Ashley[1]

1. The Selwyn Foundation

INTRODUCTION

The concept of 'Exercise as Medicine' is important at all stages of life; but arguably none more so than later in life. Recent evidence from two Australian studies, SUNBEAM (Hewitt et al. 2018) and Muscling Up Against Disability (MUAD) (Keogh et al. 2017) illustrate the linkage between progressive resistance training and a reduction in the risk of falls in older adults.

USE OF TECHNOLOGY AND/OR INFORMATION

The SUNBEAM and MUAD studies in the cited literature both make extensive use of HUR pneumatic exercise equipment. HUR Finland manufactures a range of air-powered exercise equipment that is appropriate for use by older adults. The equipment can be used with less supervision than traditional exercise equipment, and provides a gentle work-out with the ability to increase the load in small increments. The system is smart-card driven, and gathers data about individuals' usage. The equipment allows strength measurement for one-repetition maximum – used as a benchmark to set up an exercise regime – and then allows a remotely-based trained health professional (usually a physiotherapist or exercise physiologist) to review and adjust the programme accordingly.

Not the least, the gear is enjoyable and safe to use by a cohort that may never have participated in a regular organised exercise session previously.

IMPLEMENTATION/PROCESSES

For SUNBEAM, a cluster RCT of 16 residential aged care facilities and 221 participants was conducted.

The strength training was carried out on a supervised exercise circuit using a selection of HUR equipment targeted at covering the main muscle groups.

CONCLUSION

Outcomes are clear on the increase of strength and the reduction of falls, but also show a reduction in frailty, improved physical performance and balance, and a decrease in depression and anxiety.

MUAD showed a 33% improvement in leg strength, 13% increase in overall physical performance, 23% drop in the risk of sarcopenia (muscle wastage), 7% reduction in frailty, a significant reduction in falls and a reduction in depression and anxiety.

SUNBEAM outcomes demonstrated a 55 % reduction in falls and an improvement was also seen in physical performance.

As a next step, we are interested in rolling out similar programmes across NZ to reduce the pain, suffering and costs associated with falls.

WHAT MAKES YOUR SUBMISSION UNIQUE?

This submission highlights recent literature, and identifies a range of high-tech, age-friendly equipment that is novel to New Zealand.

These studies highlight the potential to grow stronger as we age, using smart exercise equipment to improve older people's strength and quality of life.

[References attached]

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ID 816 - DIGITAL HEALTH IDEA

Living in Interesting Times. How do we support clinical teams to adopt/adapt and, hopefully, thrive with new technology enablers

Rose Laing[1]

1. Canterbury Clinical Network

INTRODUCTION

The Canterbury Health System has been on a 10 year journey of change and challenge which has included the introduction of a suite of IT innovations. I have been involved as a clinical lead and innovator in one of the projects (shared care planning) and as a connector, contributor and consumer to most of the other innovations. I would like to present on the engagement with clinicians about the place of new IT platforms and tools in their day to day activity and the learnings about what has worked (and what hasn't) when introducing new technology solutions into clinical settings.

USE OF TECHNOLOGY AND/OR INFORMATION

Slow or uncoordinated adoption of IT enablers wastes resource and reduces the potential benefit of the tools for delivery of safe, efficient and collaborative patient care. Using the introduction of care planning tools as examples, I would like to describe some of the change management challenges we faced and the expected and unexpected responses to the initiatives.

IMPLEMENTATION/PROCESSES

We chose to design our care plans to require minimal training to use and, as far as possible, to support existing work flows. We started work with the willing to whom care planning already made sense then used our facilitation resources to join the willing with the rest of the system. We made sure that the care plans were linked to other IT enablers, education and political communications across the system.

CONCLUSION

I would anticipate that participants would come away with an enhanced understanding of the challenges and opportunities for change management in a complex modern health system and a view of the range of IT innovations we have piloted in Canterbury in recent years and how they fit together. They would have a better understanding of how some IT tools can be used in health systems

WHAT MAKES YOUR SUBMISSION UNIQUE?

It focusses on the implementation process for a new initiative in a complex evolving health system from a user engagement perspective.

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ID 875 - CLINICAL CASE STUDY

Local application of a Health IT Safety Framework

Kathryn Dean[1], Chris Lodge[1], Rob Ticehurst[1]

1. Auckland District Health Board

INTRODUCTION

Patient safety outcomes can potentially be improved through the use of health information technology (HIT), however in some cases HIT can introduce new patient safety concerns. The challenge for healthcare organisations is having visibility of and monitoring these risks, while also identifying opportunities for where HIT can contribute to improving patient outcomes. It has been suggested there are three overlapping domains that make up the HIT and patient safety system [1]

- Domain 1: Safe HIT
- Domain 2: Safe use of HIT
- Domain 3: Using HIT to improve safety

These domains encompass the lifecycle from identifying HIT related patient safety risks to how HIT can be used to improve patient outcomes.

[1] Singh H, Sittig DF. Measuring and improving patient safety through health information technology: The Health IT Safety Framework. BMJ Qual Saf 2016;25:226–232

USE OF TECHNOLOGY AND/OR INFORMATION

The DHB informatics team approach to HIT and patient safety is to work across all three of these domains

- Domain 1: Safe HIT. Ensuring the technology (for example software and hardware) is safe to use
- Domain 2: Safe use of HIT. HIT allows for efficient workflows and is used appropriately by end users
- Domain 3: Using HIT to improve safety. Using HIT to monitor risks and preventing harm from reaching the patient

IMPLEMENTATION/PROCESSES

When a risk or hazard is identified within the organisation, the DHB informatics team approach is to use the current organisations risk assessment and mitigation strategy to assist with describing the risk or hazard, identifying any control measures already in place, and investigating further control measures required. Using the three domains can assist with this third section as it can help ensure different solutions are considered.

Examples are listed under each of the domains:

Domain 1: Safe HIT

- Escalating the risk to the vendor
- Technical adjustments to files or databases

Domain 2: Safe use of HIT

- Implementing new Clinical Decision Support
- Training

Domain 3: Using HIT to improve safety

- Regular SQL report to identify and prevent potential harm from reaching the patient

There have been specific scenarios identified in the HIT systems used at the DHB where this philosophy has been used - there is not sufficient space to describe the scenarios in this abstract but they will be discussed in more detail during the presentation.

CONCLUSION

The DHB informatics team approach to patient safety risks associated with HIT highlights the importance of a multifaceted approach to solutions. One method of ensuring multiple perspectives are considered is to use these proposed HIT Safety Domains

WHAT MAKES YOUR SUBMISSION UNIQUE?

This outlines a teams' experience of using a novel approach to improving patient safety outcomes by applying the HIT safety domains alongside the more standard risk mitigation strategies

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ID 831 - CLINICAL CASE STUDY

Measuring clinical benefits from implementing an electronic Prescribing and Administration (ePA) system in NZ

Chris Lodge[1], Kathryn Dean[1], Rob Ticehurst[1]

1. Auckland DHB

INTRODUCTION

Auckland District Health Board (DHB) has implemented ePA as a non-early adopter site. An express objective of the project was to understand, and where possible, quantify the benefits delivered by the implementation.

As other Health Informatics Technology projects have discovered, reporting on the implementations' overall successes and failures can often be rushed or overlooked.

USE OF TECHNOLOGY AND/OR INFORMATION

The ePA implementation team was in effect from September 2015 through to go-live in October 2016. A Change Management and Quality expert worked with the team in identifying and recording appropriate clinical baseline measures.

We also leveraged simultaneous opportunities for data collection by pharmacy students, pharmacist interns and consultant audits.

In February 2018, the 'Business as Usual' team embarked on a review of the premeasures with an aim to repeat them and determine the magnitude of change following ePA implementation.

IMPLEMENTATION/PROCESSES

The 'Business as Usual' emedicines team reviewed all data collected by the project team and also reviewed measures recorded by other teams for utility. These were evaluated based on available information of how the data was collected, quality of recording and ease of being able to replicate data collection.

We audited all current inpatients (n=83) for the post measures including the categories of

- Chart legibility and legality
- Allergy documentation
- Venous Thromboembolism (VTE) documentation
- Antimicrobial Stewardship
- Co-prescribing of laxatives and paracetamol with opioids
- Incident reporting

Findings were compiled into a report for distribution to key stakeholders. The report also included a summary of the qualitative benefits of the implementation.

CONCLUSION

1. Process of postmeasures

The repeat audit was completed with significantly less manpower than the premeasures due to the availability of data in an electronic system.

One limitation identified was an unintentional lack of documentation on how data was collected and how some baseline measures were defined. This limited the usefulness of some data.

Some reporting measures had been setup during project implementation to generate automated reports. Many of these reports were written before a good understanding of clinical processes and the ePA data was understood and therefore were of limited use. Having completed a manual process we have identified improvements to be made to the automated reports.

2. Results

Our results showed improvement in all areas of VTE documentation and antimicrobial stewardship. They also showed overall positive results in co-prescribing with opioids and in chart legibility and legality.

Unexpectedly, our snapshot audit showed a decrease in the documentation of patient allergies – although for those that were documented it was of better quality. We are reviewing reasons for this unexpected result.

WHAT MAKES YOUR SUBMISSION UNIQUE?

Clinical benefits have not been widely reported from all ePA implementations in NZ. Our submission would enable DHBs considering an implementation of ePA to use recent NZ data to support a business case.

Our data shows overall benefits but importantly identified a negative result. This reinforces that there are often unexpected outcomes following a major change project and confirms the importance of doing post implementation measures to monitor and address such concerns.

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ID 804 - DIGITAL HEALTH IDEA

Medi-Map - Patient Mobile Application

Julie Garratt[1]

1. Medi-Map

INTRODUCTION

Medi-Map Linking to a patients mobile device with returned information to clinical users

There are many digital clinical solutions that manage patient information but the movement of that data is unidirectional, not patient friendly and unable to link across other health providers & information from patients is confusing.

USE OF TECHNOLOGY AND/OR INFORMATION

Medi-Map uses cloud services to manage medicine with prescribers, pharmacy and care organisations via a shared interface. This is used in NZ and AU in large numbers of aged care, mental health, rehab & hospices

Prescribers and pharmacies wanted this extend to independent patients (LTC) with granular data managed within a patient friendly UI.

MM worked with their technology partners to developed a new mobile app that could isolate a patient profile to the uuid of a device, push medicine changes, remind a patient to take their medicines, capture the record and render this record to healthcare providers

The key elements were:

- Patient friendly
- Simple to understand but able to click for more complex information and images
- Show a patient what to take, when to take and remind if not taken
- Patient request repeats from pharmacy - "deliver or Pick up' from within the app (ie: Only request what they are actually on). Pharmacy receive the request from the MM interface in their pharmacy
- Real time updating from prescriber and pharmacy
- Missed 3 consecutive doses- Text to NOK/Care organisation
- All medicine records captured by web services, records associated to the patient and medicine of that patient- viewable to the prescriber and pharmacy
- Multi-Lingual- English and Te Reo

How Are You Feeling ? - prompted once a day and captured in graphical form for prescribers - self record of how a patient says they feel

Records are managed by the Medi-Map web services - prescriber input, pharmacy actions - in real time

IMPLEMENTATION/PROCESSES

Testing was done with pharmacy, a group of patients, refined and retested, checking of the technology and uuid linking (for patient data privacy). Consideration being the ability for a patient to be able to use a mobile device

The application launched in late May and uptake managed NZ wide

CONCLUSION

To date, the beta testing and piloting has shown the patient UI works well, the data capture is verified and the pharmacy linked for repeats and supply mechanism well received.

It is anticipated My Meds (from Medi-Map) will establish a niche in medicine management for certain groups of LTC patients in NZ and AU

WHAT MAKES YOUR SUBMISSION UNIQUE?

Medi-Map has been able to join complex medicine information from prescribers and pharmacy - publish it to the (appropriate) patient, capture what they have done and then associate the patient actions back to the complex data for the prescribers, pharmacy and if involved, the care organisation

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ID 902 - DIGITAL HEALTH IDEA

Medlook – Supporting the Safe Use of Medications through High Quality Images

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1. Medlook

INTRODUCTION

Medication related errors account for significant health system spend and contribute a significant level of avoidable harm to patients. A simple way to reduce the incidence of medication errors is through the correct identification of a medication prior to administration. The use of medications images can provide an additional layer of reconciliation for patients and health professionals.

USE OF TECHNOLOGY AND/OR INFORMATION

We have developed a high quality medications image database containing over 1,100 prescription medications licenced for sale in New Zealand. The image database is fully aligned with the in the NZULM, utilising the TPUU field as its main identifier.

The database is also API enabled, meaning any provider or software vendor can have convenient and automated access to the medications. This provides health professionals and patients an additional safety net in managing medications, potentially reducing avoidable medication errors.

IMPLEMENTATION/PROCESSES

Primary interest for the database has been from software vendors of pharmacy and medications management solutions. A successful pilot was undertaken with one vendor for four months between November 2017 and February 2018, with more than 2 million image requests being processed in any one day. To enable the scalability required to meet the demand, three separate methods were used to keep image quality high while also reducing image file size (super resolution convoluted neural networks, Butteraugli optimisation and chroma subsampling). This provided the capacity to accommodate the throughput of image requests, while keeping operational and equipment costs low.

CONCLUSION

The pilot saw nurses and health care assistants working within residential care homes have access to medications images at the point of administration for their residents. Feedback provided was that the images supported the safe administration of medications through the provision of an additional safety check.

The ambition is to build on the success of the pilot and establish as a permanent medicines image service offering, while continuing to grow the database to incorporate all available medications licenced for use in New Zealand. In the medium term this will be matched with medication information and supporting functionality to enable the creation of electronic medication cards that patients can carry with them.

WHAT MAKES YOUR SUBMISSION UNIQUE?

Our submission is unique and an important milestone in improving patient safety as no other intra-operable medication image database exists in New Zealand. Furthermore, recent changes proposed to the pharmacy services contract may soon see the supply of medications and medications counselling services conducted by pharmacists for patients being split. The availability of medications images and eventually electronic medication cards provide pharmacists with an alternative means to counsel patients on the use of their medications, supporting cost effective service delivery and empowering patients to manage their health, aligning closely with the priorities of the New Zealand Health Strategy.

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ID 893 - CLINICAL CASE STUDY

mHealth from Research to Implementation: The SMS4BG example

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INTRODUCTION

SMS4BG, a self-management support programme for people with poorly controlled diabetes, was developed by The National Institute for Health Innovation (NIHI) in collaboration with clinicians and patients from Waitemata DHB. The text message based programme was found to be effective in improving glycaemic control in a 2-arm randomised controlled trial of adults with poorly controlled diabetes. Although effective in a research trial, the costs and benefits of national implementation must be explored.

USE OF TECHNOLOGY AND/OR INFORMATION

The SMS4BG programme is delivered using a text message delivery engine that combines a database of enrolled participants, individual participant preferences and tailoring variables, multiple content modules made up of schedules of text messages, and business rules of who gets which messages when. The system allows incoming messages from participants with, for example, their blood glucose results in response to a reminder to do the test. These are then automatically graphed for the participant according to time/date and made available via the website for self-review of trends over time. The scheduled messages are pushed to the participant via a third party gateway company with all messages zero-rated via the gateway to ensure no costs to participants.

IMPLEMENTATION/PROCESSES

In the effectiveness trial 366 patients with poorly controlled diabetes (HbA1c>64mmol/mol) were randomized to the intervention (n=183) or the control (n=183) group. At 9 months HbA1c was significantly lower in the intervention group compared with the control group (adjusted mean difference, -4.23mmol/mol [95%CI,-7.30, -1.15], p=0.01). Additionally, cost-effectiveness analysis found the programme to be cost-effective. The system sent over 75,000 messages to the participants and received back over 17,000 messages at a cost of 11c per message. Additional costs included $525 in gateway/shortcode costs per month. Feedback from research particpants and key stakehoders has assisted in transitioning the programme from research to be ready for implementation as a service.

CONCLUSION

This presentation will cover the costs of delivering the SMS4BG programme and the potential impact of scaling up to a full national programme.

WHAT MAKES YOUR SUBMISSION UNIQUE?

It is important to consider the costs and benefits outside the research environment to inform the decision as to whether mHealth programmes should be scaled up. They must be both clinically effective and cost effective to justify implementation into practice. Findings from this study have the potential to provide important information to funders and decision makers about the potential of mHealth tools in practice.

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ID 911 - CLINICAL CASE STUDY

Mobile Phone Application for Relapse Prevention in Community Alcohol and Drug Service

Paul Docherty[1]

1. Waikato DHB - Mental Health and Addictions Service

INTRODUCTION

The almost universal use of mobile phones offers an alternative method for delivering interventions and support for people recovering from alcohol or substance abuse.

Relapse is more likely to occur when a person feels socially isolated or vulnerable or encounters triggering situations outside of the therapeutic environment and outside of hours.

The Recovery in Hand mobile phone application (a NZ localised version of ACHESS developed in the USA) is being trialled in the Waikato DHB Community Alcohol and Drug Service as an adjunct to existing treatment programmes.

The application provides a person with additional resources and access to support outside of hours literally within arm's reach.

USE OF TECHNOLOGY AND/OR INFORMATION

Once installed on the person's mobile phone and after a brief set up process, the application allows them to access resources, discussion groups and other support functions including giving access to their counsellor during hours and National Telehealth Service after hours.

The application provides many of the needs of a person recovering from alcohol and other drug abuse, allowing journal keeping, motivation reminders, personal recovery plan/goals, as well as appointment and medication reminders. Daily and weekly surveys allow the person and clinical team to track recovery progress.

IMPLEMENTATION/PROCESSES

Initially clinical staff resisted using the application as they saw it as increasing their duties rather than as an alternative. Both clinicians and service users lacked familiarity with mobile phone application use. Implementation of the trial before Christmas led to poor initial uptake

The aspect most challenging for counsellors is the change in mind-set required when moving to a model where the client is encouraged to access support on their own; and support each other (moderated by clinicians).

CONCLUSION

At time of submission the first six months of implementation have focused more on solving technical rather than clinical use of the application. It is likely that the one year trial will need to be extended to ensure sufficient time to measure therapeutic benefit on the lives of the participant service users; and resource impact on counsellors involved.

WHAT MAKES YOUR SUBMISSION UNIQUE?

The greatest challenge and the one most likely to be of interest is the change in clinician mind-set associated with the use of new technology opportunities such as this.

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ID 920 - DIGITAL HEALTH IDEA

Navigation and Hazard Identification Application for the Mobility Impaired Undertaking Hiking and Great Walks

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INTRODUCTION

Renowned for picturesque landscapes, New Zealand offers a plethora of breathtaking tramping and hiking opportunities to locals and tourists alike. Unfortunately for the growing number of athletic yet mobility-impaired persons, they are not able to fully enjoy the magnificent outdoors – they are limited to trails that are well-known to be accessible and safe. The lack of detailed, up-to-date and reliable information about many of the trails is a big hurdle that is discouraging many mobility-impaired persons from venturing out into many of New Zealand's Great Walks.

USE OF TECHNOLOGY AND/OR INFORMATION

Our objective is to provide detailed, up-to-date and reliable information about New Zealand's tramping and hiking trails to empower mobility-impaired individuals to decide for themselves whether to undertake a hike on a trail, and if they do so, provide guidance on potential hazards, when to take breaks, and many other useful information about the trail. At the heart of the solution is a mobile app that combines crowd-sourced information and data from built-in mobile phone sensors to precisely locate a user, upcoming hazards alert, and provide advice such as taking rest prior to a difficult and potentially hazardous elements of tracks, such as heavy slopes and potentially slippery surfaces. In addition, the app also allows users to report many aspects about the trail, take pictures, and post comments. These user inputs can enhance the guidance provided by the app, and ensures that information are up-to-date and reliable.

IMPLEMENTATION/PROCESSES

A mobile app is being developed as a graphical interface to the intended users. A cloud-based server application is also being developed to respond to user queries and store information posted by users. Both of these components have been partially completed, and will undergo testing with the target users.

CONCLUSION

Today's powerful smartphones are excellent vehicles for efficient information sharing to empower individuals to pursue their aspirations. In this project, information is used to enable athletic mobility-impaired persons to undertake hiking and Great Walks. The mobile app and cloud software are continuously being developed and will be tested with the target users.

WHAT MAKES YOUR SUBMISSION UNIQUE?

The use of mobile app for guiding mobility-impaired persons to complete a hiking trail is a novel idea.

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ID 833 - DIGITAL HEALTH IDEA

Networking the digital voice of the patient

Glenn Martin[1], Blaik Wilson[2]

1. Southern Cross Health Society
2. Cemplicity

INTRODUCTION

How can the voice of 850,000 New Zealanders be heard efficiently by a network of hundreds of medical specialists working in a distributed health setting? Southern Cross Health Society (SCHS), with support from Cemplicity Ltd, have established a patient reported outcome measurement system with results surfaced in a cloud-based reporting portal that is also configured for medical providers to SCHS.

USE OF TECHNOLOGY AND/OR INFORMATION

The SCHS pre-approval and claim systems produce a register of patients for Cemplicity to survey before patients undergo treatment (when a pre-approval is required), and then again 90 to 180 days following treatment. To date, over 50,000 patient surveys have been collected across a wide range of specialties and procedures - with more being added daily.

Cemplicity collates, aggregates and analyses this anonymous feedback giving Southern Cross a view of patient experiences and outcomes across specialty, facility and individual providers. A cloud-based reporting portal provides rich insights and configurable views of the data. Sentiment analysis and automated alerts are also part of the solution.

The data is presented in a personalised dashboard to SCHS health service providers to support ongoing quality improvement initiatives. There is a real-time view of how they benchmark against their anonymised peers and surfacing of patient comments to drive improvement.

IMPLEMENTATION/PROCESSES

The project started in 2014 with the selection of internationally validated survey tools from Oxford University (OEQ) and EuroQol (EQ-5D). A proof of concept pilot was completed before the full programme was launched with Cemplicity as a co-design venture. With Cemplicity being a SaaS company, SCHS are now leveraging the benefit of being one of a growing network of organisations using their data collection and reporting platform.

CONCLUSION

The power of digital has unlocked a previously untapped patient view of outcomes and experiences. The rich data being collected is leveraged across the network to confirm the quality of outcomes and provide signals for improvement. This data is leading to an increasingly patient centric view of health that supports not only better outcomes and experiences but helps to highlight where value drivers sit.

WHAT MAKES YOUR SUBMISSION UNIQUE?

In an environment where the voice of the customer is sometimes viewed as a threat, SCHS and Cemplicity have developed a digital solution that enables the sharing of the patient voice across a broad network of specialities in a way that increases confidence for all parties but more importantly improves outcomes for patients.

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ID 851 - DIGITAL HEALTH IDEA

Northern Region prepares for Cyber Security Attack

Simon Long[1]

1. HealthAlliance

INTRODUCTION

The continuing rise of cyber-attacks against the health sector make it likely that it is a matter of when, not if, a major incident will disrupt operations at a DHB. This probability prompted the Northern Region DHBs to undertake a response exercise to a simulated cyber-attack.

The objective of the exercise was to test and improve a regional view of business continuity and IT recovery capability covering functionality for patient safety, patient movement and communication.

USE OF TECHNOLOGY AND/OR INFORMATION

The exercise focused on recovery of 3 technology areas:

- E-mail had been hacked, offering the challenge of communicating details of a cyber-attack to our 26000+ users
- A growing key service, Wi-Fi in hospitals, was unavailable
- Data integrity of clinical records could not be trusted

IMPLEMENTATION/PROCESSES

Through a collaborative planning approach, a table top exercise was devised with more than 100 people across the region including hA, DHB, PHO, and MOH representatives taking part. A one day simulation of the progression of attacks, including a ransomware demand in crypto currency, was played out.

CONCLUSION

The exercise provided an opportunity to validate the region's cyber incident management processes and identify opportunities for improvement

1. Regional decision making using the Information Security Incident Management Plan
2. Regional organisation business continuity, both within the organisations individually using their BCPs and regionally, by looking at cross-DHB capability
3. IT system recovery capability, using the healthAlliance processes for major incident responses
4. Cross communication resilience amongst the organisation

WHAT MAKES YOUR SUBMISSION UNIQUE?

This is the first Northern Region Cyber dry-run exercise that included joint co-ordination and participation from all northern region DHBs, hA teams, and MOH representation. Since this exercise, other Health Organisations have approached us for advice in devising their own exercise.

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ID 900 - DIGITAL HEALTH IDEA

'NOT reinventing the wheel' Bringing Opioid substitution treatment online, utilizing and tweaking our existing EMR to manage and prescribe Opioid Substitution

Fay Cunningham[1]

1. WDHB

INTRODUCTION

Waitemata District Health Board provides the largest Drug and Alcohol treatment centre in the country. Patient records for all Mental Health & Addiction services were already fully electronic and available to clinicians working across the 3 Auckland DHB's with the exception of the system managing opioid treatment and prescribing. The current system was standalone, end of life and poorly integrated into any other system being used to capture clinical information, the Pharmacies dispensing and the primary care practitioners sharing the care of this client group. It was also limited solely to the prescribing and management of methadone substitution.

USE OF TECHNOLOGY AND/OR INFORMATION

The current EMR was already being used for the management and prescribing of usual medications so it was felt that extending and customising this system would provide the best solution and allow a fully electronic and integrated tool to manage this unique prescribing challenge. By using the already invented wheel costs were kept low and the change management kept to a minimum.

IMPLEMENTATION/PROCESSES

A core group of key stakeholders comprising doctors, key workers, pharmacists and administration staff were engaged to examine current process and workflows, identify gaps and wish lists, map to current Ministry must haves and design a user interface based on workflows. A detailed specification document was developed outlining the multi-disciplinary workflows and key functionality required to support this. Working with the vendor the scope of work was costed and carried out to embed the new functionality into our existing EMR.

It went through many iteration's of delivery, tweaking, testing and changing of minds and policy before being released into a build candidate.

CONCLUSION

Building on existing and accepted technology was both a positive and a negative, the positive won. Engaging with the people that would use the technology and basically giving them carte blanche on the design and functionality was a unique and sensible way to approach the solution but not without its pitfalls, having users involved at that level meant scope creep was inevitable and the wishlists got longer at every turn!

WHAT MAKES YOUR SUBMISSION UNIQUE?

Our 'NOT' reinventing the wheel approach seems reasonably unique and allowed something extremely complex and fraught with legal must haves to be delivered creatively and cheaply. Choosing the latest and greatest always seems so appealing but often results in non-delivery. This project allowed us the unique opportunity of taking a clearly defined and rigid workflow and really tailoring a solution to closely mirror that very workflow without it being watered down in a generic solution.

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ID 919 - CLINICAL CASE STUDY

Online Community and Living Well programme for NZers with breast cancer

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1. melon health
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INTRODUCTION

Breast cancer is the most common cause of cancer among New Zealand women and the third most common cancer in New Zealand. Challenges for women diagnosed with breast cancer include coming to terms with the initial shock of being diagnosed, communicating with friends, family and co-workers, intimacy issues, the physical changes in appearance as a result of treatment and - what is not widely understood - the long term side effects some of which may be permanent.

USE OF TECHNOLOGY AND/OR INFORMATION

The Breast Cancer Foundation of NZ is NZ's largest support service to women and men affected by breast cancer as well as funding new research, raising awareness of the importance of early detection and educating healthcare professionals and the public alike.

They teamed up with Melon Health to design and develop mybc.care, an online community and support tool for NZ women and men affected by breast cancer and their family and whanau. Mybc has helped over 1000 women by connecting them with others going through a similar journey, providing access to breast care nurses and helping them monitor side effects while encouraging healthy lifestyle changes.

Mybc is a responsive website and android and iOS applications.

IMPLEMENTATION/PROCESSES

Building on Melon's existing online community and digital health platform and features, the Breast Cancer Foundation of NZ (BCFNZ) reached out to women with breast cancer and organised focus groups where we asked them what they'd want from an online support tool. We spoke with women with breast cancer in different parts of the country and from a range of ethnicities including Maori, Pacific, South Asian and Pakeha. The Breast Cancer Foundation also reached out to specialists to ask them what kind of additional support they believed patients would benefit from beyond the clinical setting. What was consistent was the desire from women to connect with others in a safe, secure online environment and where they have access to Breast Cancer Foundation breast care nurses. BCFNZ and Melon co-created resources for a Living Well programme which were curated by BCFNZ's medical committee.

CONCLUSION

Eighteen months on and mybc has proven to be a thriving, sustainable community and important support tool for New Zealanders affected by breast cancer with new people signing up daily. Inbound calls to BCFNZ have dropped as more women seek and receive support from Mybc. Breast cancer specialists across the country are referring patients to it.

WHAT MAKES YOUR SUBMISSION UNIQUE?

Mybc is the first cancer survivorship programme delivered in NZ and first of it's kind worldwide delivered online providing tools and peer support beyond the clinic setting. Posted today on Mybc: "i am 29 years old and have just been diagnosed with breast cancer in both breasts. I'm so grateful to have found this app and for all the support I've received".

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ID 984- CLINICAL CASE STUDY

Optimising medicines at Scotland's largest health board

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1. Orion Health

INTRODUCTION

NHS Greater Glasgow & Clyde (GGC) is Scotland's largest health board, made up of 17 acute sites, 400 wards, 7000 beds and 10,000 users.

NHS GGC eHealth embarked on a large project in late 2016 to replace their legacy forms-based medication reconciliation and discharge summary solution across all 17 acute care facilities. Medication data integration, usability and workflow within the existing system limited adoption and a new approach was required.

NHS GGC engaged Orion Health to deliver an innovative solution to reduce manual transcription, reduce clinical risk and improve clinician workflow.

USE OF TECHNOLOGY AND/OR INFORMATION

Using Orion Health's Medicines and Care Pathway solutions, a data centric, task-orientated pathway approach to producing a reconciled e-discharge summary was developed.

The admission to discharge pathway allows multiple clinicians to track and perform multiple tasks to facilitate the safe transfer-of-care on discharge.

IMPLEMENTATION/PROCESSES

The key medication safety aims of the project was to reduce the manual transcription of medicines on admission and discharge (reducing the risk of medication errors and time wastage).

NHS GGC wanted to increase uptake and improve quality of a formal medicines reconciliation process and re-use of medication information facilitating data flow through the hospital.

Given the scale and aggressive roll-out plan for NHS GGC, a comprehensive implementation plan was devised. Super-users were identified, and super-user orientation and training sessions provided pre-go-live for each hospital site. On the floor training and support for two weeks post go-live for each site was also provided.

CONCLUSION

Feedback from clinicians was overwhelmingly positive. Users found the solution was intuitive and easy to learn.

Prescribers soon realised the benefits of reconciling medications at admission to improve workflow at discharge when generating the e-discharge summary.

Clinical pharmacist feedback was also positive and found the solution safer and quicker than previous one.

One key lesson learnt was the inherent complexity of the process. Real life practice is highly variable and context dependent. It is important not to let 'great' be the enemy of 'good'.

WHAT MAKES YOUR SUBMISSION UNIQUE?

NHS GGC is Scotland's biggest health board; this project was equal parts mammoth and complex.

Given the similarity between the Scottish and New Zealand healthcare spaces, the New Zealand DHBs could apply key learnings from this project.

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ID 980 - CLINICAL CASE STUDY

Patient information in the palm of your hand

Andrew Cave[1], David Ryan[1]

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INTRODUCTION

The vision of our mobility programme is that by 2020, Waitemata DHB staff will achieve an extra hour of productivity per person per shift. One time saving opportunity came from Doctors spending up to 20 minutes manually compiling a list of their patients and outstanding tasks at the start of every shift.

The list is annotated with notes, tasks and reminders throughout the shift. The paper list is great, but has many shortcomings:

- It is a privacy risk when it is misplaced
- It is manually curated, so patients can be easily missed
- The list must be updated manually
- Frequent meetings in the stairwell are arranged to "Run The List", which are required to update all team members about the status of patient tasks

Given that all the information on that paper list is available in clinical systems, we set about to create a mobile app to put the list in the clinician's hand, on their own mobile device.

USE OF TECHNOLOGY AND/OR INFORMATION

We took a mix of common technology building blocks to build a mobile app that presents your list of patients. It provides access to the latest observations, Early Warning Score, current medications, lab results, and enables clinical photos to be added to the patient's record.

IMPLEMENTATION/PROCESSES

An Agile Development process was used to deliver the app. After the initial Wire Frame mock-ups, features were developed and data integration was enhanced over a 5-month period, after-which the first Release Candidate was produced. After extensive testing, technical security review, and penetration testing were complete, the first version was made available to a small group of clinicians.

This group generated a significant amount of feedback, and resulted in a second round of development that delivered significant performance improvements, and better integration with other clinical systems used on the desktop fleet during ward rounds.

In the presentation I will cover deployment steps, adoption rates, feedback received and issues identified.

CONCLUSION

1. Focus on the Minimum Viable Product to get the first release out to users. With "Evergreen" support, you can then deliver continuous value to clinicians with each improvement.
2. Don't underestimate user expectations. Due to the ubiquitous nature of high quality apps on everyone's smartphones these days, the bar for performance & user experience is much higher than it was a couple of years ago.

WHAT MAKES YOUR SUBMISSION UNIQUE?

To our knowledge, this is the first DHB developed application of this type to provide patient information in the palm of your hand.

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ID 799 - DIGITAL HEALTH IDEA

Post-Acute Care and Referral Management: Coordination + Collaboration + Continuity = the Continuum of Care

Laura Pietromica[1]

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INTRODUCTION

A physician executive once indicated that post-acute care has long been an archipelago of small islands, with no bridges, poor transportation, and limited communication options to the rest of the health care system [1].

With the worldwide shift of patient centred care moving from the four (4) walls of the hospital into post-acute care settings, how can the healthcare sector help bridge this gap? One way might be the implementation of a proper referral management solution.

USE OF TECHNOLOGY AND/OR INFORMATION

The post-acute care (PAC) space includes a variety of facilities and organisations that help to continue to care for patients transferred or discharged from a hospital setting. Communication with the transferring facility, the patient and their support system and the multidisciplinary care team is important.

Implementing a referral management solution helps ensure effective and concise information exchange between acute and PAC organisations. It can cut down the time it takes the post-acute care facility to review a case and determine that the patient can be effectively cared for based on their needs prior to the admission.

IMPLEMENTATION/PROCESSES

Oftentimes clinicians and allied health professionals are working with an incomplete patient record and searching for information stored in disparate systems or through stacks of paper records. To prevent these complications, the PAC facility can better manage their referrals in order to capture the correct, relevant information quickly.

The referral management solution should:

- Facilitate the transfer of the appropriate document types to the organisation;
- Empower staff to make well informed clinical and business decision prior to admission; and
- Improve processes, including admissions, by offering a streamlined design.

The audience will take away the following learning points:

1. Suggested document types to include in the referral process;
2. Benefits of electronically managing the Release of Information (ROI) requests to securely share protected health information (PHI); and
3. Determination where automation can replace checklists, manual intervention, human error and bottlenecks.

CONCLUSION

Post-acute care settings help reduce re-admission to hospitals by closely monitoring the patient for complications and changes in their conditions. Having a referral management solution that captures the correct information at the time of the patient referral and provides secure direct communication between the referring facility and post-acute care setting is imperative to keeping the patient healthy, happy and cared for based on their individual needs.

WHAT MAKES YOUR SUBMISSION UNIQUE?

Knowing what to look for in a referral management solution can help an organisation choose correctly. This presentation will give audience members tips and tricks on what to look for.

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ID 842 - DIGITAL HEALTH IDEA

Precision Driven Health Partnership Success

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1. Orion Health
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3. Precision Driven Health

INTRODUCTION

The Precision Driven Health partnership, established in March 2016, is one of the most ambitious data science research initiatives to be undertaken in New Zealand. The partnership unites our health IT sector with health providers and universities to create health and commercial opportunities for New Zealanders.

Precision Driven Health (PDH) was created to put NZ at the forefront of the global precision health movement through world-leading research. This involves applying new data science techniques to understand the massive volume of data that an individual generates across systems including health information systems, consumer devices, social networks, and genomics. The initiative will invest $38 million over a seven-year period.

USE OF TECHNOLOGY AND/OR INFORMATION

In the first two years, PDH has invested in 45 projects, supporting over 70 researchers including academics, students and industry. Some of these have led to prototype apps for vital signs monitoring and discharge management, chatbots, growth charts and stroke outcome prediction. Others have involved pilot studies that have saved lives, such as precision screening for abdominal aortic aneurisms. The PDH team were awarded the Research & Business Partnership Award at the KiwiNet Awards in 2017.

IMPLEMENTATION/PROCESSES

At HINZ, a number of projects supported by PDH will be presented. Each one represents a partnership between clinical, scientific and commercial parties. Some of the current exciting PDH projects include predicting and tailoring interventions to individual patients.

One area of research for PDH focuses on the application of deep learning to electronic health records. PDH is building a platform to combine the different data types contained in a patient's health record, and predict multiple outputs. It aims to analyse all information on an electronic health record (EHR) to find patterns and combinations of risk factors, giving clinicians a more holistic view of a patient. Ideally, once a person's health data is collected and stored on their EHR, deep learning could be applied to help clinicians find "patients like me" - the deep learning model would be able to define what aspects of similarity were important.

PDH research has also looked at image classification for skin conditions, medication reconciliation, and the development of New Zealand-specific risk calculators. All of these approaches are leading to a suite of tools available to the health sector and data science researchers.

CONCLUSION

PDH has made a successful start, and initial projects are showing a lot of promise for improvements to health decision making through the use of data science tools. The engagement across public and private sector partners has been critical to the success of this work.

WHAT MAKES YOUR SUBMISSION UNIQUE?

PDH is a genuine partnership across public and private parties. This has led to a greater understanding across different parts of the sector, and a collaborative working relationship.

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ID 841 - CLINICAL CASE STUDY

Prescribing in Pregnancy: using a gold-standard at point-of-care

Amber Young[1], Bryan Simpson[1]

1. New Zealand Formulary

INTRODUCTION

The New Zealand Formulary (NZF) is an open access resource providing healthcare professionals with clinically validated medicines information and guidance on best practice. Originally, the NZF adopted international codes to describe medicine risk in pregnancy, however there has been international movement away from using these codes for many reasons e.g. misinterpretation and not describing risk changes in different trimesters. The NZF did not have resources to create new information and was looking to adopt new information about medicine use in pregnancy.

USE OF TECHNOLOGY AND/OR INFORMATION

The NZF approached Wolters Kluwer, the publishers of Drugs in Pregnancy and Lactation ("Briggs"), a resource widely considered the gold-standard for medicine risk in pregnancy information. Wolters Kluwer were open to the proposal for the NZF to integrate their data into drug monographs.

IMPLEMENTATION/PROCESSES

We received the data as an XML file and developed a programme to map the New Zealand Medicines Terminology (NZMT) for drug names to the Briggs monographs. We then reviewed and compared the messages in each publication together to decide a) if some of these data from the NZF should be retained; b) if the Briggs data should be edited e.g. removal of US–specific support groups and contact numbers. Editing was undertaken in the programme and once completed, work cards in the NZF project management system were automatically created to alert other members of the team that sign-off was required. Once completed, the new pregnancy information will be automatically incorporated into our active Content Management System where all changes to NZF content are made. This enabled widespread simultaneous changes to NZF content.

CONCLUSION

Collaboration with international resources is achievable. Through innovative use of technology, large-scale data changes can be made without disruption to the NZF monthly cycle.

Lessons learnt:

1. Incorporating gold-standard clinical resources can be a cost effective approach to updating clinical information.
2. In the initial stages of implementation we considered manual mapping and editing, which would have taken considerable NZF resource to complete. Early collaboration between the technical and clinical teams identified processes that could be automated.

WHAT MAKES YOUR SUBMISSION UNIQUE?

The NZF is a resource that is used widely in New Zealand by a variety of healthcare professionals. This submission is unique because it describes how collaboration between different international medicine information resources is possible for the benefit of digital health information users in New Zealand on a large scale.

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ID 954 - DIGITAL HEALTH IDEA

Proactive Patient Flow

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INTRODUCTION

Patients and families often rely on the Emergency Department in times of trouble. However, Emergency is not always the appropriate venue of care. In fact, there is often a more optimal venue. It is vital patients understand treatment and care options, while also receiving support from the health system to better align care across the continuum.

The need for a better methodology to proactively identify and manage patients who could benefit from comprehensive care was imminent. Patients were not receiving the right support, health checks were being missed, and conditions were worsening. Progressing initiatives already underway with comprehensive care planning, multidisciplinary care teams, and establishing a single source of truth for data combined from over 35 disparate source systems made comprehensive care possible.

USE OF TECHNOLOGY AND/OR INFORMATION

A vendor-neutral platform was implemented to onboard data from clinical, financial, device, public, and many additional disparate data sets, to create a single big-data environment in support of comprehensive patient care.

The multidisciplinary care team then use this data to support patients and organisational imperatives. Patients are evaluated and cared for in a streamlined fashion, through the use of algorithms and attribution logic. The approach evaluates patients for: all clinical factors (conditions, medications, vitals, problems, etc.), health system utilisation, functional limitation, as well as sociological factors like; past clinical encounters, income and poverty levels, and access to community services (i.e. grocery, fitness, general practitioners and health centers, public transport, etc.).

The algorithms continuously surveil the data from all sources evaluating indicators to determine where attention and effort need applying.

Once a patient or imperative is flagged as at-risk the responsible member of the multidisciplinary team is notified, proactively.

IMPLEMENTATION/PROCESSES

Onboard data such as; 20 different EMRs, a disparate EMPI, retail pharmacies, claims and payor systems, various laboratory systems, and open data sources.

The combination of these data types enabled proactive outreach to patients due or overdue for care and schedule them for general practice, outpatient, or specialist appointments, in advance of them presenting in the emergency due to known complications.

CONCLUSION

The comprehensive care team and integrated care platform implemented enabled proactive patient encounters.

- Appointments scheduled roughly 3 months earlier than past years
- Achievement of 97% quality score of all health systems across The USA, among the highest in the nation.
- Financial savings of $60.6 Million in taxpayer money
    - $6.1M in Asthma Care (direct and in-direct medical costs)
    - $7.34M in Diabetes Care
- $93M Reduced Out of Pocket Expense for Generic Prescribing Initiative

Health systems may currently have a multidisciplinary approach to care delivery for their respective patient community. These tools can augment that approach to eliminate unplanned encounters, reduce time seeking and attempting to collect information from multiple sources of data while enabling true comprehensive care.

WHAT MAKES YOUR SUBMISSION UNIQUE?

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ID 982 - DIGITAL HEALTH IDEA

Process Mining in Healthcare - Waitemata Case Study

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INTRODUCTION

Process mining is an emerging data science discipline in which an institution's event logs are retrospectively analysed to discover the actual processes that are occurring. This strategy is particularly suited to domains where planned pathways may falter in day-to-day execution due to significant stressors. Healthcare is a prime candidate given the high-pressure work environment, uncertainty, and life-and-death consequences it involves - all the while operating with limited resources. International studies using process mining in healthcare have uncovered valuable insights to optimise care pathways. However, there has been a dearth of such studies in paediatrics, and none conducted in New Zealand.

This study will use process mining to analyze the actual care pathways followed after newborn babies are discharged from the Waitemata Special Care Baby Unit (SCBU). The pathways elicited will be checked for concordance with recommended clinical guidelines; and, inefficiencies such as bottlenecks or avoidable repetition will be identified. The results could help optimise the post-SCBU care pathway.

This study could help set the stage for similar studies to be conducted in other district health boards (DHBs) throughout New Zealand. Such analysis, grounded in retrospective granular data, could also be used as a benchmark to identify and emulate successes in the New Zealand healthcare system.

USE OF TECHNOLOGY AND/OR INFORMATION

Process mining; event logs. See abstract above.

IMPLEMENTATION/PROCESSES

The study has not been conducted at the time of writing.

CONCLUSION

The study has not been conducted at the time of writing. Therefore, conclusions cannot be drawn at this point.

WHAT MAKES YOUR SUBMISSION UNIQUE?

Process mining in healthcare has yielded promising results in overseas case study. We believe that applying this emerging discipline to New Zealand hospitals has the potential of uncovering areas of improvement, as well as shed light on how processes could be improved. This has important implications on both patient safety and efficient use of a limited set of healthcare resources.

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ID 962 - DIGITAL HEALTH IDEA

Proven Keys to Unlock Health Data

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INTRODUCTION

The increasing digitisation of health care has seen exponential growth in the amount of data that is captured in electronic form. While the initial focus has been on providing the tools to support clinicians at the point of care, there is a largely untapped resource in the data that has been accumulated. Granting access to that valuable resource has limitless potential to inform current and future practice.

USE OF TECHNOLOGY AND/OR INFORMATION

When implementing clinical systems, the project focus tends to address the immediate aim of introducing the new technology and promoting it to general use. In many projects, the opportunity to access the resulting data is overlooked or shelved, while all effort is directed to getting the clinical system live. In addition, many systems store the data in a proprietary format or complex schema that is unusable by most clinicians.

A clinical system will impose changes to a clinician's workflow and can influence practice. By providing usable access to the data, clinicians will have the capability to realise multiple benefits from clinical, research and operational perspectives.

MKM Health has developed a solution and implemented a streamlined process to source data from systems of all types and technologies to establish a consolidated point of reference.

IMPLEMENTATION/PROCESSES

We access source data using our ETL (Extract Transform Load) routines or other processes such as replication. The data initially populates a staging database which is the reference point for the underlying detail. We then apply data cleansing and mapping algorithms to align the data with our health care model.

In one implementation, this approach has refined the data stored in thousands of tables in the source systems to less than forty tables. This model streamlines analysis and aligns the data with intuitive definitions.

The solution employs a security framework to ensure access is controlled which includes limiting enquiries to de-identified data and alignment with local ethics policies and procedures.

Health Services are now actively using this data to inform research, clinical practice and operations. Some examples include:

- qSOFA sepsis algorithm applicability
- Oncology mortality versus cancer protocol
- Opioid use across patient cohorts
- Analysis of breast feeding patterns by locality
- Specialist service referral triage

A significant advantage of our approach is that health services can continue to use their preferred business intelligence and statistical analysis tools.

CONCLUSION

Our approach to data delivery is non-proprietary and provides stakeholders with a streamlined, intuitive means of accessing and analysing data. It unlocks the potential of a valuable asset that can be used to inform and improve care delivery and patient outcomes.

WHAT MAKES YOUR SUBMISSION UNIQUE?

- The solution and approach are proven

- It is non-proprietary and can work with multiple systems and technologies
- There is a growing interest in the most effective means of accessing and using data to inform clinical practice, research and operations

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ID 861 - DIGITAL HEALTH IDEA

Qlik for the Intensive Care Unit

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INTRODUCTION

The Intensive Care Unit (ICU) cares for a hospital's most unwell patients. Providing the best care to these patients requires access to the Unit in a timely manner. Providing the appropriate level of this costly resource to meet patient needs requires an accurate picture of demand. We used QlikSense to understand this demand to ensure we have adequate resources to meet our local patient need for high acuity care.

USE OF TECHNOLOGY AND/OR INFORMATION

Visualising workflow and demand for ICU has been a laborious process in the past, highly dependent on the availability of scarce analyst resource. We have many clinical datasets, but they are not accessible to clinicians in a way that allows them to shape the data themselves and answer their own questions. Using QlikSense, we were able to extract data from a number of databases to understand the pattern and volume of demand for ICU beds. We have also been able to concurrently measure evidence-based indicators for the ICU environment. This information formed the cornerstone of a recent business case for additional staff.

IMPLEMENTATION/PROCESSES

The ICU Qlik dashboard was developed by a Senior Medical Officer with intimate knowledge of clinical processes and advanced technical skills, in close collaboration with a data analyst with extensive knowledge of the clinical data. We used Qlik's flexible data model to determine hourly patient levels and importantly, the number of nurses required to safely staff these patient beds and provide sufficient flexibility to meet any increases in demand. Due to Qlik's ability to continuously collect, analyse and report data, we were successful with our business case for additional nursing staff. We now also have a suite of best practice clinical indicators. We are able to interrogate the data with a few mouse clicks to identify areas for improvement, a process that would usually take hundreds of hours of work. Importantly, this process has improved collaboration between clinical and managerial staff in understanding our systems and processes of care, and in evaluating options to improve outcomes.

CONCLUSION

Our business case would not have been successful had it not been for our ability to integrate and report on clinically meaningful data in such an efficient manner. We have demonstrated the use of data discovery tools to successfully advocate for increased resourcing and simultaneously created a framework for continuous quality improvement to drive future improvements in patient care. We now have a framework that will facilitate rapid quality improvement cycles, improving patient care and ensuring that we are making best use of resources.

WHAT MAKES YOUR SUBMISSION UNIQUE?

Having a Senior Medical Officer as technical lead was critical to the success of this development. His in-depth understanding of the clinical processes coupled with his technical ability created more meaningful data model and visualisations.

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ID 965 - DIGITAL HEALTH IDEA

Reducing delays in first dose administration of antimicrobials at Christchurch Hospital

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INTRODUCTION

Time to administration of intravenous (IV) antimicrobials (Abx) is associated with increased mortality and length of hospital stay in community acquired pneumonia (CAP) [1] [2]. Prior work has shown that electronic health records can be used to retrospectively define the impact of delays in Abx administration (DIAA) have on patient outcomes [3]. MedChart, the electronic prescribing and administration (ePA) system implemented within Canterbury District Health Board (CDHB), potentially allows real-time insight into patterns of care within the hospital. As a first step in leveraging the advantages of ePA adoption, our work will define DIAA within CDHB, by characterizing the time between prescription and administration of the first dose of IV Abx.

USE OF TECHNOLOGY AND/OR INFORMATION

MedChart was implemented in Christchurch Hospital in 2016. To identify DIAA in the MedChart database, SQL queries defined key meta-data around process prescription to administration. Time series analytics and visualization were performed in R. This flow could be automated and integrated into dashboards or a decision-support system.

IMPLEMENTATION/PROCESSES

Using a list of key IV Abx a query extracted key process steps, including times of prescription, allocation, dispensing from central stores, and administration. A second query will follow a multidisciplinary educational intervention to reduce DIAA. Comparing the pre- and post-intervention cohorts will deliver real-world efficacy of the intervention. Data is analysed within R using the tidyr and lubridate packages. Data will be analysed by day and time of prescribing, ward, type of antibiotic, and other covariates to ascertain correlations to staffing, location, and other organizational factors.

CONCLUSION

Preliminary analysis of pre-intervention cohort shows significant variation in DIAA, correlating today of week and time of day prescribing occurred. Analysis of this cohort is ongoing and will be presented in final form at the meeting. The intervention is planned from July to August 2018. Re-analysis will occur in October. Comparison will be made using descriptive statistics to assess the impact of the intervention. Future work will include the development of routine review service to identify and re-educate service sectors where DIAA remains a persistent problem. Long-term, there is an objective to develop a real-world alerting system to flag ward supervisors when individual patients are at risk of DIAA.

WHAT MAKES YOUR SUBMISSION UNIQUE?

The learning healthcare system model of assess-implement-reassess has not been widely implemented in the NZ healthcare systems. One of the promises of digital healthcare is the ability to automate this cycle. This project represents a real-world secondary use of digital healthcare data to improve patient outcomes.

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ID 932 - DIGITAL HEALTH IDEA

Resident Medical Officer app

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INTRODUCTION

Currently first year doctors reference a RMO handbook which is a 500 long page pdf file. It's not easy to find information quickly; it's not mobile device friendly and requires the doctor to find a computer to be able to navigate through this pdf document. On the other hand the content managers are only able to make updates/amendments to the pdf once a year since it goes through the process of meetings to collect feedback from users, approval cycles for the updates/changes, editing the pdf and then publishing as well as ensuring that each and every doctor gets a copy of the latest version.

USE OF TECHNOLOGY AND/OR INFORMATION

Mobile app will be available on Apple/Google stores. Information served via this app is now in full control of the content providers and it also has a Content Management System which allows for better management of content and layout of the app. Alongside the app, we have also used the same CMS data to serve up a website which basically provides another channel for the end users. This way for the users who don't have access to a smartphone, will have a website.

IMPLEMENTATION/PROCESSES

We started with understanding the challenges faced by the doctors and how the pdf is being used. We also discovered how this app gets used by doctors as they advance in their medical career. We then asked for a group of first year doctors to tell us about apps (medical and non-medical) which they used on a regular basis and asked them what features of each did they like the most. This served as the backlog creation of features to be delivered via this app. Once we identified a Product Owner, we worked together to define a MVP scope and started to create prototypes/wireframes. These wireframes went through a few iterations until the PO locked in on one and we then started development using an Agile framework. We've built this app on Azure platform.

CONCLUSION

We've learnt that it's good to pick one mobile platform to build an app first and release it to a set of users. Incorporate feedback and then start developing for other platform(s). Since the app doesn't require any integration with existing ADHB IT systems, it has been easier to plan the design/architecture which will also result in a faster deployment to a production instance in the cloud platform.

WHAT MAKES YOUR SUBMISSION UNIQUE?

The app can be easily re-skinned for different types of content. App definitely has the potential of regional use.

It also highlights a very important change to how ADHB has been operating till now. We have embraced change and emerging technology and as such this is our first attempt at developing something with minimal cost and time to empower our clinicians.

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ID 907 - DIGITAL HEALTH IDEA

Robotic Process Automation – Freeing our People from Low-Value Tasks for Immediate Value.

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1. Quanton
2. Hutt Valley DHB

INTRODUCTION

With limited effective technology integration, we are using high-value human capital inefficiently often transferring data between multiple systems, completing low-value tasks. Shayne Hunter (HVDHB) coined the term "swivel chair automation". Technology systems are a core issue relating to the current levels of inefficiency in our health system. Legacy systems, specialised, and general applications often don't integrate with processes and technical limitations mean system integration is often not possible or uneconomical to achieve.

USE OF TECHNOLOGY AND/OR INFORMATION

Robotic Process Automation (RPA) enables unattended and autonomous automation of digital processes. The technology mimics the actions of humans to access systems through the front-end graphical-user-interfaces. Software robots execute processes based on pre-defined business rules. Transactions which can't be completed because of business rules or system exceptions are referred to the human workforce.

IMPLEMENTATION/PROCESSES

Following Initial assessment (Jul16) and formal business case a pilot programme launched (Dec16) at Hutt Valley DHB. e-Referrals process was selected for pilot. A sub-set of clinical services that patients can be referred to were automated. During the pilot (3-Months) over 1,500 e-referrals were processed using RPA. The successful completion rate of over 75% provided over 127 hours back to the organisation.

Following comprehensive review the programme became permanent. e-Referrals Automation has been extended to include additional clinical services (Now twenty-two). For the 3-months ended 30 April 18, RPA completed over 5,900 e-referral registrations and 4,500 e-referral processing transactions with a success rate of 72% and 77%. Estimated benefit for the period is over 800 hours.

CONCLUSION

RPA drives immediate benefits in the form of time savings, efficiency and output. Intangible benefits include processing quality (no human error), higher compliance, auditability (full audit logs and data for insights), increased reporting and rich data analytics.

Key learnings include the impact of system outages (planned and unplanned), effect of system changes and the handling processes of e-referrals requiring exception management.

Hutt Valley DHB have completed an opportunity assessment designed to identify a pipeline of future processes to automate and provide benefit estimates.

The current plan is to extend the programme within Hutt Valley DHB, to Capital & Coast DHB and eventually Wairarapa DHB on a process-by-process basis.

WHAT MAKES YOUR SUBMISSION UNIQUE?

RPA is live at Hutt Valley DHB delivering measurable and tangible value (Full paper and case study available).

Hutt Valley DHB is creating a scalable virtual workforce to complete low-value tasks and empower our people.

The solution is not limited to a department, system or use-case and is being designed for transferability reducing costs of scaling.

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ID 967 - CLINICAL CASE STUDY

Safety in Practice: A low input, data driven initiative reducing high-risk prescribing in primary care

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INTRODUCTION

An estimated 29% of patient harm occurs in the community and 8% of patients report being given the wrong medicine or dose in primary care. Non-steroidal anti-inflammatory drugs (NSAIDs) are the most commonly implicated medication resulting in hospital admission. Adverse effects include renal damage, gastro-intestinal bleeding and worsening of pre-existing heart failure.

Safety in Practice (SiP) is a quality improvement programme, based on Model for Improvement methodology. SiP provides tools and training to primary care teams, to reduce preventable harm to patients. The programme focuses on proven high risk areas, such as medicines reconciliation, results handling, anticoagulants and opioids. Practices test change ideas for improvement, based on data from small audits of 10 patients per month, generated from queries within their Patient Management Systems (PMS). Practices monitor their progress through automatically generated run-charts and submit their data for aggregation to the SiP team.

USE OF TECHNOLOGY AND/OR INFORMATION

In 2017/18, SiP trialled a module focusing on high-risk NSAID prescribing. This module is automated through the practices in house audit tools and requires less intensive support. Working together with practice audit tool vendors Dr Info and Mōhio, practices were provided with a monthly list of patients prescribed NSAIDs where the prescribing was considered high-risk against evidence based criteria.

IMPLEMENTATION/PROCESSES

Practices are only required to provide a total number of patients within each of the risk categories each month. Practices are given guidance on best practice and suggestions for change, then left to action the reports as they wish. The intervention has been well received, practices report significant change in their processes and thinking around this high-risk medication. Interim data for the first 9 months suggests consistent overall reduction in high-risk prescribing of NSAIDs.

Challenges faced include permission to share data between vendors, practices and the SiP team and perfecting searches within the PMS.

CONCLUSION

Neither the technology nor the clinical knowledge applied is new. However, this novel, low input intervention involved collaborative arrangements between clinicians, vendors, PHOs and DHBs. After implementation, support required to create and sustain change was minimal, with meaningful impact on prescribing behaviours. We're looking to expand this approach to include other high-risk medicines.

WHAT MAKES YOUR SUBMISSION UNIQUE?

This clinically designed programme, led to data and tech innovation to follow the needs it created, as opposed to a being programme designed to around limitations in current tech capability. The intervention had a measurable impact on safe prescribing practice on a large scale, requiring minimal, sustainable input once audit tool established with maximum self-directed output, sustained over 9 months to date.

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ID 840 - DIGITAL HEALTH IDEA

Self-monitoring and reporting of medicine adverse effects in oncology patients

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INTRODUCTION

Oncology patients at the Southern District Health Board (SDHB) contact a designated oncology nurse, or the oncology ward after hours, via telephone if they experience adverse effects. The nurse triages patients by using an algorithm based on the UKONS 24-hour triage toolkit. This helps the nurse decide what advice to give, e.g. attend emergency services, undergo monitoring, or self-care advice. This system relies heavily on nursing resources, and many patients are reluctant to call for fear of time-wasting.

USE OF TECHNOLOGY AND/OR INFORMATION

We will build a web-based tool based on the algorithm above. Patients will input their symptoms at any time and:

a) receive self-care advice targeted to their symptoms, or

b) be triaged, e.g. to general practice, oncology, or emergency services, as appropriate.

The interaction with the tool will be logged at the hospital in the patient's record, alerting the oncology nurse if further contact is needed, and will also be sent to the patient's GP inbox.

IMPLEMENTATION/PROCESSES

1. Literature review for similar studies identified and analysed.
2. Acquired international collaborators to share experiences, obtaining permission to access similar systems.
3. Collaborating with SDHB oncology department (Clinical Oncology and Haematology team) to determine feasibility.

CONCLUSION

We learned the value of discussions with teams involved in similar projects internationally. Project leaders in the UK informed us of obstacles faced and what could be done differently.

We also learned that floating preliminary ideas with vendors and the sector early on is vital for project implementation.

Next, this system will be developed and piloted in community-based patients taking oral chemotherapy. The system will be able to be rolled out nationally and in future, the system could potentially be used to incorporate GP alerts for other potentially-toxic medicines such as DMARDs and biologics.

WHAT MAKES YOUR SUBMISSION UNIQUE?

The proposed technology is a first for New Zealand and will differ from those being trialled in the UK. Our system will interact closely as 'one team' with the hospital EHR and GP systems, to alert both patients and clinicians when urgent referral is required. The tool will also provide patients with other information such as general medicine advice (including on missed doses, common precautions, interactions) and provide links for further information. Providing reputable and useful information will potentially improve safety and adherence.

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ID 814 - DIGITAL HEALTH IDEA

Sharing Adverse Reactions Across the Digital Ecosystem

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INTRODUCTION

For the past year HISO has sponsored a project to develop a Standard to collect information about Adverse Reactions, and make that information available to those who need to access it (and have a right to do so), including the Consumer themselves. Borrowing from the methodology used to develop the highly effective FHIR® standard, the project is developing a guide that has had cross sector input, and practical validation.

Adverse Drug Reactions (ADRs) are a significant cause of morbidity and mortality in the patient population and contribute to the incidence of adverse events, resulting in increased healthcare costs. The detection, management, documentation and reporting of ADRs are important for ongoing patient safety.

USE OF TECHNOLOGY AND/OR INFORMATION

The project started by identifying the clinical need, and then collecting the requirements from a group of expert users (including Clinicians and Analysts). Following this we developed a model to collect this information using the FHIR standard and the clinFHIR tooling. Alongside this work, we developed a reference architecture compatible with the National EHR. This has a central repository of this information and specific resources derived from that, which are accessible via FHIR based APIs, and can also be made available for analysis and reporting. The security details of the access was not in scope for the project – though it was noted that this is required, and some recommendations were made.

IMPLEMENTATION/PROCESSES

At the time of writing this proposal, our plan is to validate the model as both appropriate and also implementable using a Connectathon, where cross sector participants including Vendors can test the model using a number of real-world scenarios. The testing will include both clinical validity and technical viability using prototypes to exchange information between the participants. As part of the Connectathon, reference servers with sample data and examples of automated processing will be developed and these artifacts will remain in a Sandpit to assist implementers.

CONCLUSION

The project is significant for a number of reasons. Firstly it brought together sector participants in a common goal to share information across a digital ecosystem, that can – quite literally – save lives. And secondly it is the first nationally sponsored FHIR based implementation guide.

WHAT MAKES YOUR SUBMISSION UNIQUE?

Note to reviewers. Our belief is that this topic is of wide interest, being a practical example of using FHIR for a national project, and so should be considered as a plenary session. It can be delivered in 30 mins, though 45 would be optimal.

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ID 928 - CLINICAL CASE STUDY

Simplifying clinician workflows and improving patient care

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1. Zebra Technologies

INTRODUCTION

Every day, clinicians are confronted with the difficult choice of either leaving their patient's bedside to retrieve their important health records, or remaining at their bedside and making do without the clinical data required to confidently administer patient care. This workflow dilemma impedes informed decision-making and prevents clinicians from utilising patient information in efficient, intelligent ways.

USE OF TECHNOLOGY AND/OR INFORMATION

Inefficient and overly complex health information management processes create clinician workflow barriers & separates the healthcare professional from their patients, resulting in compromised patient care delivery. This is evidenced by the fact that 56% of the time spent by hospital nurses is on activities unrelated to patient care administration and 43% of all hospital nurses leave their jobs within 3 years of employment. One example of this is the Truman Medical Centres (TMC).

Nurses at TMC, an academic health system in Missouri that operates 51 clinics with two inpatient facilities were required to carry more than five communication devices, including a phone, laptop, camera and pager to effectively do their jobs. Truman's approximately 1,200 nursing staff serves nearly half a million patients each year, ranging from outpatient visits across their 51 clinics to trauma and acute admissions. To optimise nursing workflows, patient care and staff satisfaction, TMC needed to identify a new approach to improve overall workflow and patient care.

IMPLEMENTATION/PROCESSES

TMC turned to Zebra's TC51-HC mobile computer and Cerner's CareAware Connect™ solution, which wrapped all the necessary functionality into a single device that nurses can use to provide immediate care to patients at the bedside. Incorporating voice and text communications, camera capture, barcode medication administration, breast milk and transfusion tracking, nurses were given the freedom to communicate without interrupting patient care.

CONCLUSION

The implementation significantly improved communication workflows, saved valuable time and reduced preventable medical errors by putting a safeguard in the hands of every nurse.

Reducing the number of communication devices from five to one cuts the average number of steps taken over a 12-hour shift nearly in half – from more than 15,000 to 7,800 steps. Planning has begun for Zebra's innovative solution to be extended to all clinical and select ambulance staff in the near future.

WHAT MAKES YOUR SUBMISSION UNIQUE?

Mobility workforce solutions have an under-appreciated value and offer a surprisingly high potential capability to transform patient care delivery quality within a hospital. This is fully appreciated when one considers that a single hand-held device, is both a fully functioning mobile computer and a multi-dimensional clinician workflow tool. Zebra's clinical mobility solutions, embedded into the hospital technology ecosystem automates workflow processes, improves task accuracy, and increases the time clinicians spend with patients, ensuring that they are able to provide critical care right from a patient's bedside where they need it most.

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ID 866 - DIGITAL HEALTH IDEA

Skin cancer detection mobile App: enhancing diagnosis with deep learning

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INTRODUCTION

New Zealand have the highest incidences of skin cancers globally. There is no population skin cancer screening programme in New Zealand due to the lack of evidence and prohibitive cost. It is estimated that skin cancers cost New Zealanders an average of NZ $ 83 million annually in both private and public hospitals.

USE OF TECHNOLOGY AND/OR INFORMATION

As an aid to clinical decision making and detection of malignant skin lesions, we have developed an iOS mobile app equipped with an image classification algorithm trained with the convolutional neural network (CNN) technique. The training was performed with clinical skin photographs. The algorithm was designed to detect human naevi and perform a malignancy risk assessment.

IMPLEMENTATION/PROCESSES

We have selected 6226 images for training. The benign lesion category consists of benign naevi, pigmented benign keratosis, and seborrheic keratosis. The malignant lesion category consists of malignant melanoma, squamous cell carcinoma and basal cell carcinoma.

The training framework architecture is based on Tensorflow's InceptionV3. The framework is integrated onto a cloud-based development platform (https://ai.medicmind.tech/). The malignancy network was validated with a subset of skin images from the ISIC database. The trained algorithm has an accuracy of 81.3% with a sensitivity of 83.3% and a specificity of 79.2%.

CONCLUSION

To our knowledge, there are no research trials of skin cancer detecting mobile apps that uses the Tensorflow Inception V-3 framework architecture. SkinVision is the only skin cancer detection and monitoring mobile app available but it uses fractal image analysis to determine the risk of malignant melanoma with a referral sensitivity of 73% and the specificity was 83% for malignant melanoma.

The algorithm that we have developed appears to have a superior performance and is promising as a population self-screening tool. It may also add value when it comes to decision-making in a primary care setting with regards to performing a biopsy or further referral to a skin specialist.

WHAT MAKES YOUR SUBMISSION UNIQUE?

The end product that we have developed is the first of its kind using the latest machine technology. It is a technological feat that has the potential to solve a major health challenge in New Zealand. We are at the stage of planning and design to ensure the project will be delivered to benefit the public in a sustainable manner.

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ID 937 - DIGITAL HEALTH IDEA

Skin disease image recognition tool

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INTRODUCTION

Our proposal for a skin disease image recognition tool was winner of the Active project category of the 2017 Clinicians' Challenge. This presentation is intended as a progress report.

There is a worldwide shortage of dermatologists and an ever increasing number of patients with skin diseases. These are difficult to diagnose and manage, and are burdensome to patients. Powerful new computing systems allow machine learning technology to be applied to medical images.

With several hundred thousand labelled images, and worldwide connections, DermNet New Zealand is well placed to explore artificial intelligence solutions in dermatology. Our dream is to support healthcare providers to manage patients with skin diseases anywhere with an internet connection.

USE OF TECHNOLOGY AND/OR INFORMATION

Development of the proposed tool depends on a research team composed of dermatologists, primary care physicians, software developers, machine learning experts and others.

Business and legal hurdles have required wide consultation and the creation of DermNet Technologies LLC.

IMPLEMENTATION/PROCESSES

To date, we have built relationships with several universities, District Health Boards, and dermatology artificial intelligence development companies within New Zealand, Canada and the United Kingdom. We have employed several image technicians and a data scientist to tidy up our database of images—entailing deidentification, classification and tagging. We are inviting global contributors to supply the thousands of dermatology images required for each category, and planning to enhance image categorisation by adding information such as age, gender, ethnicity, body location and lesion history.

Our images are already being used by third parties for machine learning projects in a Summer Studentship, a PhD project, and skin lesion classification.

Following our first successful grant application, we are actively seeking funding and partnership opportunities.

CONCLUSION

The future for dermatological technology is exciting but also daunting. Dermatological diagnosis requires more than a single image – we need to understand the patient background, the presenting symptoms, the distribution, configuration and morphology of lesions. We need to design ways to enhance the quality of submitted images and to ask the right questions. For clinicians to trust our tool, it must be clinically validated in various situations.

WHAT MAKES YOUR SUBMISSION UNIQUE?

Modern image analysis tools give some hope to the world of Dermatology, which suffers from lack of manpower and innovation.

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ID 815 - CLINICAL CASE STUDY

Sue's Story: Remote Monitoring of COPD

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INTRODUCTION

Sue, a 59-year-old smoker with emphysema who had 15 Emergency Department presentations with exacerbation of COPD and anxiety over an eight-month period.

Sue being assessed as Level 4 (terminal) was referred for monitoring by the Palliative Care team who felt that further in home support would benefit her.

USE OF TECHNOLOGY AND/OR INFORMATION

With the support of Corumbene Care, an in-home Tunstall's Connected Health monitoring solution and personal alarm was installed in Sues' home where she was shown how to measure her vital signs using the medical equipments and to answer a series of clinical questions to determine her current condition.

IMPLEMENTATION/PROCESSES

The vital signs and answers to clinical questions taken by Connected Health platform are available in real time to the Registered Nurses via Tunstall's secure Integrated Care Platform (ICP) for comment and feedback. Abnormal readings are flagged for follow up with her GP.

Along with care coordination, Referrals were made to community services such as social work, dietician, respiratory physiotherapist and the Asthma Foundation. After an agreement with her usual GP and another GP, Sue was also given the option of being passively admitted to the local hospital rather than the need for calling an Ambulance to take her to the main area hospital.

CONCLUSION

Sue was actively monitored for six months, after 4 months on the program palliative care team reassessed her as a Level 2 – inactive, also she did not call an ambulance and had one presentation that resulted in an admission.

The development of a COPD action plan allowed Sue to recognise her symptoms in the home and with the support of the Tunstall's Connected Health platform, Sue was able to liaise with a Registered Nurse which resulted in reduced access to emergency services.

Sue's confidence increased in managing her disease, decreased her anxiety levels and her weight had increased from 36kg to 42kg.

Sadly Sue passed away from complications not long after finishing her remote monitoring, due to a newly diagnosed condition.

WHAT MAKES YOUR SUBMISSION UNIQUE?

The power of client centred care customised to the individual client and the addition of telemonitoring has not only allowed Sue the opportunity to self-manage and gain a better health literacy perspective around her conditions but has totally changed her quality of life and removed the burden on the strained health system. If this same program could be rolled out for other high needs clients the health system would benefit greatly.

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ID 879 - DIGITAL HEALTH IDEA

Supporting Mental Health Needs through eTalk

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INTRODUCTION

eTalk is a virtual brief intervention counselling service, where clients can access mental health support over the phone in a 30 –45-minute session. With this approach, traditional barriers such as transport or time off work fall away.

eTalk was designed and implemented in response to an increasing need to support primary mental health services in the Canterbury region following the Kaikoura Earthquakes in 2016. Independent qualitative evaluation of this new service in 2017 by AUT Centre for eHealth found it to demonstrate good flexibility, lack of judgement and greater comfort levels for clients.

USE OF TECHNOLOGY AND/OR INFORMATION

eTalk is not designed to replace brief intervention counselling (BIC), but is a supportive adjunct for existing BIC services grappling with increasing demands, access and volume. As part of a stepped model of care, eTalk can effectively manage clients in the mild to moderate range of assessed support needs.

The eTalk service was initially delivered by leveraging off the technology of the national telehealth service and underpinned by its clinical framework. As we seek to further improve the client experience and functionality, we are currently implementing a significant user driven service redesign that has a new IT system through which we will deliver the eTalk service. This includes:

- Integrated online booking
- Automated patient engagement
- Clinical questionnaires
- Integrated client portal with messaging function

IMPLEMENTATION/PROCESSES

Since launch, eTalk has supported 113 patients with 451 counselling sessions. 63 of these patients were included as part of the evaluation. Those service users where both a pre- and post-treatment score was captured - reported a reduction in reported distress of 10.6 points on Kessler. Symptom reduction ranged from 2 – 28 points.

CONCLUSION

We know through qualitative review that eTalk delivers positive outcomes for service users. In concert with what our services users think, indicators of success have also been demonstrated by renewed funding arrangements with Canterbury DHB and interest from other funders into how their health systems could also benefit from eTalk.

WHAT MAKES YOUR SUBMISSION UNIQUE?

eTalk is an example of utilising technology and the national telehealth service platform to build capacity to enhance local health system. This has been shown to increase accessibility while delivering proven and measurable mental health clinical outcomes. Through the planned future enhancements of this service over the coming months, we anticipate further gains to be made into improving the patient experience

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ID 882 - DIGITAL HEALTH IDEA

Supporting Patient Safety - Treatment Injury Information

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INTRODUCTION

In 2016/17, ACC accepted 9,900 claims for injury caused by medical treatments. Each of these claims represents a person who was harmed during the course of treatment. Most of these injuries are considered preventable.

Health professionals and clinical teams also need support to understand what happened and try to prevent the same harm from occurring again.

In this publication, information on claims for treatment injuries in public hospitals is presented – along with information on treatment injuries in member hospitals of the New Zealand Private Surgical Hospitals Association (NZPSHA).

By publishing this information, ACC wishes to encourage an open and informed discussion about treatment injury.

USE OF TECHNOLOGY AND/OR INFORMATION

Dashboards have been developed for 20 DHBs and NZPSHA. The information provided in each dashboard includes only treatment injury claims resulting from treatment in the hospitals. The name of the facility where the treatment causing the injury was delivered is provided to ACC by the registered health professional lodging the claim.

The main purpose of tracking the number of treatment injuries over time is to encourage improvement within each hospital. Each accepted claim represents a person who was inadvertently harmed during the course of treatment. The treatment injury frequency count provides one indication of physical injury experienced by patients due to treatment.

IMPLEMENTATION/PROCESSES

During the development of this information, ACC engaged with the sector extensively to focus on specific injury types.

ACC also undertook data matching exercises with all DHBs and NZPSHA members. The data held by ACC was compared with the claims data held by the hospitals.

CONCLUSION

The publication of this information has increased engagement with the sector as well highlighted areas of opportunities. Along with treatment injury rates, the rate of declines (40% declined) have also been highlighted.

ACC is currently developing a lodgement guide in partnership with the DHBs to ensure treatment injury claims submitted to ACC are more accurate with less likelihood of the claim being declined.

ACC has also supported Hutt Valley DHB's prevention of peripheral intravenous cannula associated infections initiative. Hutt Valley's surveillance data showed significant increase in healthcare associated Staphylococcus aureus blood stream infections over recent years. This was corroborated by ACC's infections data.

WHAT MAKES YOUR SUBMISSION UNIQUE?

Volume and cost of treatment injury claims have been rising over the last few years. The current value of future costs of all existing treatment injury claims is $5.7 billion (as at June 2017). The publication of the treatment injury information provides a case for investment in prevention, as effective improvements in treatment safety reduce patient harm.

The release of the information also means that ACC is able to be consistent with the government's desire to increase transparency of health information.

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ID 971 - DIGITAL HEALTH IDEA

Supporting Risk Stratification Algorithms with a Web Based Decision Tool

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INTRODUCTION

There is poor uptake of risk stratification algorithms aimed at reducing unplanned hospitalisations of chronic disease patients. We present a Web Based Decision Tool that has been developed to support a 12 month trial of such algorithms at a major Australian public hospital. The trial started on 1 April 2018.

USE OF TECHNOLOGY AND/OR INFORMATION

The developed algorithms employ routinely collected administrative data from emergency department and inpatient admission information systems, and pathology, medication and death registry data, to predict two important risk metrics:

- Unplanned re-admission within 30 days of discharge;
- Unplanned emergency department presentation within 30 days of discharge.

The risk stratification results are presented via a Web Based Decision Support tool that is installed on a Queensland Health Server and made available to all care teams participating in the trial.

IMPLEMENTATION/PROCESSES

The algorithm is run every night at 1am and generates risk scores for every admitted patient with a chronic disease history. In accessing historical data for these patients, the algorithm accesses central data repositories to ensure patient history is sourced from all Queensland hospitals attended by the patient. When staff login to the tool, they access a list of all patient and risk groups based on their level of risk, standardised within the local population of the region. Two scores are presented, one for each of the developed risk metrics. Clicking on either of the risk scores takes the user through to a novel representation of the top 5 factors contributing to increased risk for the patient in the given risk metric (See Figure 1 for an example). It also allows users to sort the list of patients by date of admission, each of the risk scores, name, and current ward. It also provides search and export capabilities to enable users to download and use the provided information in spreadsheets or other tools for care planning.

CONCLUSION

We present a novel implementation of predictive risk stratification that generates risk scores for admitted patients overnight and presents them in a clinically meaningful manner to various care teams planning and managing in-hospital treatment and post-discharge interventions.

WHAT MAKES YOUR SUBMISSION UNIQUE?

Our implementation extends risk scores beyond being just a number. It provides information about factors influencing increased risk at the individual patient level, thus helping clinical users better understand the risk scores and employ them in practice.

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ID 793 - CLINICAL CASE STUDY

"Talkin' about a revolution": OpenSource electronic health records in resource-constrained settings. A continuing success story (2000 to 2018 and beyond)

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INTRODUCTION

OpenMRS is an established eHealth revolution. Founded in 2004, OpenMRS is a free, modular open-source (OSS) electronic medical record platform used in about 3037 sites in low and middle-income countries (LMIC), involving more than 8.7 million patients. OpenMRS is a multi-institutional, non-profit collaboration supported by a large open source community.

The OpenMRS medical record features location-based login; patient registration, search, and summary, including diagnosis, vitals, visits, allergies, actions, admissions, discharges and transfers; configure metadata; forms management; data management (merge patient electronic records); system administration; and registration to the OpenMRS Atlas which reports implementations worldwide.

OpenMRS uses diverse technologies, international clinical standards, HL7 and Fast Healthcare Interoperability Resources (FHIR) support; adaptable APIs, support for core services via REST-WS module and multiple identifiers per patient. Electronic forms data entry, data export and e-patient workflows. It has multilingual formats and has add-on or developable modules.

The OpenMRS electronic record is easily be adapted and scalable to local requirements. OpenMRS tools are used for passive disease and program surveillance in combination with the Suite for Automated Global Electronic bio-Surveillance (SAGES) tool. The WHO Millennium Villages Project (MVP) introduced OpenMRS and mobile phone technology in sub-Saharan African countries to achieve its goals.

OpenMRS was designed to be used to combat HIV and has had significant impact in both prevention, screening and treatment. Of OpenMRS in 2009 Braitstein wrote, "Now not only are HIV/AIDS programs in place, ...but some of them, are openly speaking of bringing the pandemic to its knees over the next 5 years through widespread screening and effective treatment and prevention of HIV." In 2012 it was the most commonly used OSS in centres involved in HIV care and in non-HIV related programs.

The use of OpenMRS in LMIC demonstrated that disease management was only possible by using an electronic medical record system like OpenMRS. The WHO implemented guideline training for OpenMRS in clinics leading to a 50% reduction in unnecessary treatments for malaria. Furthermore, during the Ebola epidemic OpenMRS allowed for actionable data, rapid responses, and e-model model for future epidemics and crises. Clinical data empowered the Ministries of Health to develop healthcare policies to prevent the rapid spread of epidemics and improve the delivery of publically provided health services.

The OpenMRS worldwide revolution-implementations worldwide. Examples:

Bangladesh: https://www.thoughtworks.com/clients/dghs-bangladesh,

Rwanda: file:///Users/terryhannan/Downloads/Rolling_out_OpenMRS_in_Rwanda-PIH%20(1).pdf;

Kenya: https://wiki.openmrs.org/display/ke/KenyaEMR;

Jembi Systems: https://www.jembi.org/wp-content/uploads/2015/04/Chris-Seebregts_HISP-Presentation-OpenMRS-3.pdf

Philippines: OpenMRS is in more than 200 sites in the Philippines. http://actamedicaphilippina.com.ph/content/community-health-information-and-tracking-system-chits-lessons-eight-years-implementation-pi

WHAT MAKES YOUR SUBMISSION UNIQUE?

OpenMRS continues to demonstrate leadership and effectiveness in the use of Open Source Systems (OSS) in LMIC with local community self-sufficiency and ownership of the clinical system fully supported by the OpenMRS consortium. As a eHealth project it has been nominated for a Nobel peace prize.

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ID 903 - CLINICAL CASE STUDY

Telehealth for Speech Language Therapy - Reaching the Corners of the Waikato

Deborah McKellar, Leisha Davies-Colley[1]

1. Waikato DHB

INTRODUCTION

Waikato DHB Speech Language Therapy (SLT) department is a small team providing services to patients within a large geographical region. The majority of ambulatory services are offered in a hospital outpatient clinic setting, and patients have to overcome many challenges to attend these appointments. These challenges include travelling long distances, relying on others for transport, getting time off work, and finding parking at hospital sites. If a patient is facing these challenges, it can limit the frequency that they participate in direct SLT services, and create barriers for access. For some SLT treatment programmes, frequency of input is related to improved intervention outcomes.

USE OF TECHNOLOGY AND/OR INFORMATION

The SLT team utilised a variety of services offered by Waikato DHB to offer video-consults to patients at rural hospital bases or in their own homes. These video-consults negated the need for the patient or the clinician to travel to appointment sites.

IMPLEMENTATION/PROCESSES

Three stages of implementation which were based around the different platforms that Waikato DHB introduced:

1. Cisco Jabber. The SLT team were able to provide hospital to hospital video-consults, including urgent inpatient assessments. This enabled increased frequency of appointments to patients based in rural hospital areas, particularly during times of reduced staffing. Urgent inpatients were able to be assessed and a management plan put in place, without the need for the patient or the clinician to travel long distances.
2. SmartHealth. The SLT team were able to offer patients video-consults from their own home or place of work. Patients were able to attend appointments in their lunch breaks from a quiet space at work, or could attend more frequent appointments at home. Challenges came in the registration process for patients and reliability of the platform.
3. Jabber Guest. The SLT team are due to start pilot project using Jabber Guest, implementing this technology for video consults in patient's home or place of work.

CONCLUSION

Video consults are a viable method of providing SLT input to patients where travel is a barrier to access services. However in order to be successful the platform needs to be reliable and fit for purpose.

WHAT MAKES YOUR SUBMISSION UNIQUE?

This presentation will explore the experiences of patients, their families and clinicians undertaking video-consults through multiple platforms, and will share the learnings from these experiences which would be applicable to any medical, nursing and allied health professionals looking to provide video-consults.

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ID 931 - CLINICAL CASE STUDY

The File Room is Empty – Conclusion of a 10 year Incremental Transition to Electronic Records – Permission to Dispose of Paper

Paul Docherty[1]

1. Waikato DHB - Mental Health and Addictions Service

INTRODUCTION

The benefit of having patient records available electronically includes immediacy of access for clinical decision makers.

Transition to electronic records will often occur in a big bang approach possibly including back scanning of some existing paper-based clinical records; and may result from an external driver such as consolidation or change in distribution of services or serious clinical incident.

Mental Health and Addictions services generate considerable amounts of narrative information for each patient with high risk that volume of narrative information becomes overwhelming; necessitating greater focus on useable structure. Attempts to scan paper records in bulk may result in loss in of structure.

USE OF TECHNOLOGY AND/OR INFORMATION

Waikato DHB Mental Health and Addictions Service did not take the big bang approach instead choosing incremental document substitution; a strategy chosen as a consequence of other information gathering requirements; rather than electronic records being the end in itself.

Using an electronic (XML) form toolkit integrated into Waikato DHB's Clinical Workstation forms were incrementally introduced to replace paper and also support better information gathering for management and KPI reporting.

Document substitution is based on progressively replacing paper based information collection with equivalent electronic forms without scanning. Each new MoH requirement resulted in a focus of gathering information for that requirement directly and electronically.

IMPLEMENTATION/PROCESSES

As forms were introduced clinicians had a transition period during which they could continue using paper or use the new electronic versions.

Incremental increase in use of electronic forms was coupled with an incremental increase in clinician computer literacy supported by training. Clinicians have not been required to make dramatic changes in information use from paper-based to electronic paradigms. The result is that each transition or step up in use has not been threatening to staff.

CONCLUSION

With permission to dispose of paper given by Archives NZ's Chief Archivist, Waikato DHB Mental Health and Addictions Service is able to dispose of any remaining paper collections once scanned and verified.

Waikato DHB Mental Health and Addiction service has not maintained paper files since December 2015 and in 2018 all existing paper files have been moved to offsite storage.

Waikato DHB Mental Health and Addictions service provides a model for low cost, low risk implementation of an electronic clinical record albeit occurring over a 10 year period.

WHAT MAKES YOUR SUBMISSION UNIQUE?

This paper concludes the paper presented at HINZ 2013 'Not with a Bang – An Incremental Electronic Record Implementation' providing closing chapter to this multi-year transition from paper-based to electronic clinical record.

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ID 797 - DIGITAL HEALTH IDEA

The Importance of Choosing the Correct Vendor Neutral Archive (VNA)

Laura Pietromica[1]

1. Hyland

INTRODUCTION

Medical images are becoming an increasingly important part of a patient's medical record. As patients move between care providers and their care becomes more complex, medical images need to be available for sharing and collaboration between care providers. To help facilitate the sharing of medical images and clinical content the organisation needs to implement an intelligent enterprise system capable of managing all medical content – a Vendor Neutral Archive (VNA). While the need is present, choosing the correct one is a challenge because not all VNAs are created equal.

USE OF TECHNOLOGY AND/OR INFORMATION

Organisations have made strides embracing and deploying health information technology (IT). Despite the large sums of money organisations have invested in IT, there remains a large amount of unstructured, unmanaged health information. Traditional Picture Archiving and Communication System (PACS) do not easily extend images to clinicians providing the care nor do they manage non-DICOM medical image formats (e.g., JPEG, MPEG, PDF, etc.).

PACS provide the features, functionality and workflow necessary to access, manage and interpret images; however, they use proprietary code. As a result, the proprietary and departmentally based PACS solutions facilitate departmental solutions rather than organising medical imaging to support the broader enterprise with an integrated solution. This makes image sharing within and outside the enterprise complicated and costly, especially when trying to incorporate sharing of specialty images (e.g., Dermatology, Gastroenterology, etc.) that fall outside of traditional PACS parameters.

Implementing a VNA expands upon the PACS and provides a long-term storage solution, collaboration and sharing functions required in today's complex model of patient care.

IMPLEMENTATION/PROCESSES

The most important characteristic of a VNA is that it is vendor neutral, even to itself. A true VNA supports multiple viewing technologies using a variety of protocols. It allows a customisable viewing experience to meet the needs of each clinical specialty area. It also supports a viewing technology so that imaging studies are obtained directly from the VNA instead of being reliant on the PACS.

CONCLUSION

With the cost of medical imaging studies rising, health organisations are looking to defer cost by extending their affiliations and networks to share medical images and gain better control over the shared management of information. This creates a need for quick medical imaging sharing that is highly secure. Selecting the correct VNA will help organisations achieve their objectives and optimise the imaging environment today into the future.

WHAT MAKES YOUR SUBMISSION UNIQUE?

Choosing the correct VNA is difficult however we know the key characteristics that an organisation should consider including:

1. Integration in a way to align the organisations imaging investment as an enterprise investment.
2. Improving the opportunity to interoperate with other systems.
3. Expanding capture of both DICOM and non-DICOM information from other specialty departments.
4. Seamlessly integrates imaging information with Electronic Health System (EHR).

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ID 859 - CLINICAL CASE STUDY

The Introduction of a Nursing Eportfolio into a large District Health Board

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INTRODUCTION

The Nursing Council of New Zealand (NCNZ) requires 5% of nurses to complete a recertification audit every year. Counties Manukau Health's (CM Health) accredited programme was previously a paper based portfolio process which was bulky and often cumbersome to manage. Assessors often expressed unnecessary anxiety of being responsible for these important documents whilst in their possession for assessment. Over the last 12 months CM Health has introduced an electronic portfolio after a successful pilot. This was a project led by nursing and supported by technical colleagues.

USE OF TECHNOLOGY AND/OR INFORMATION

The e-portfolio uses the Mahara platform which is integrated with CM Health's Ko Awatea(KA) LEARN Learning Management System. The project team were able to take advantage of a platform staff were familiar with and were already set up with log on/password.

IMPLEMENTATION/PROCESSES

A working party was formed and the system was tested every step. A mapping exercise was undertaken and every process of the portfolio journey was analysed and reviewed to establish a seamless approach consistent with NCNZ's requirements.

Communication was vital to the success of this rollout. Key messages were developed and sent out on a regular basis. The DHB made the decision that from 1.1.18 the ePortfolio system was the only method for portfolio submission. Paper based portfolios would not be accepted after this date.

A train the trainer model was undertaken for the nursing educators' team to develop their skills. There were many opportunities, including drop-in sessions, offered in multiple settings for staff to come and learn the new system and be guided in establishing their user platform.

CONCLUSION

The introduction of a nursing eportfolio has been successfully implemented into CM Health. There was learning on the job as the system was rolled out and this continues today. To date we have over 1500 nurses enrolled into the eportfolio gateway. Communication and the support of key stakeholders were vital for the success.

WHAT MAKES YOUR SUBMISSION UNIQUE?

While this presentation is about the nursing eportfolio, the system is multi-disciplinary. It is already set up for Allied Health staff to complete the Career and Salary Progression programme electronically. This is currently awaiting sign off to go live. In addition processes are underway for Ward Clerks and Health Care Assistants to have their merit steps portfolios developed into an electronic format.

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ID 939 - DIGITAL HEALTH IDEA

The Power of a Coffee and a Cheese Scone: How the dedicated team model is transforming a long-term partnership

Chris Cunningham[1], Daniel Ng[2]

1. Southern Cross Hospitals
2. Orion Health

INTRODUCTION

The delivery of healthcare technology is renowned for its complexity. The sector is littered with fixed-price projects that have failed due to poor planning and inflexible delivery. The projects that succeed are those in which healthcare providers and technology suppliers work in a manner that fosters genuine collaboration, especially those which utilise the dedicated team model.

It is for these reasons that Southern Cross Hospitals and Orion Health have created a health innovation hub, adopting a design-led way of working. The hub consists of a dedicated group of healthcare professionals, business leaders and IT techs, working together to solve complex problems.

USE OF TECHNOLOGY AND/OR INFORMATION

Southern Cross Hospitals' digital maturity goal is to have implemented a full electronic health record by 2021. A key initial phase, in partnership with Orion Health, was the delivery and roll out of a Clinical Portal to their 14 wholly-owned and joint-venture comprehensive hospitals across New Zealand.

In order to accelerate their progress towards the 2021 goal, Southern Cross Hospitals has identified the need to deliver business change with greater speed, flexibility and business focus.

IMPLEMENTATION/PROCESSES

The innovation hub builds on the two organisations' long-standing relationship through the establishment of a strategic partnership in which a cross-functional team (consisting of members of both organisations) work shoulder-to-shoulder to create and deliver new solutions.

The dedicated cross-functional team is co-located at a converted residence on Southern Cross Hospitals' Brightside Hospital campus, where the team often collaborates over coffee and homemade scones.

CONCLUSION

True collaboration between teams who share a common goal is a powerful way to drive change in any complex health IT environment.

There is a long list of sub-projects which the team is methodically ticking off to support Southern Cross Hospitals' transition towards their electronic medical record objective.

WHAT MAKES YOUR SUBMISSION UNIQUE?

The dedicated team model differs greatly from the more common fixed-price model of software delivery. This somewhat unconventional approach sees individuals from different organisations working as one team to enable quick wins, flexibility and continuous delivery of incremental value.

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ID 862 - CLINICAL CASE STUDY

The role of clinical speech recognition in improving quality, speed and turnaround of clinical documentation in acute care

Simon Wallace[1]

1. Nuance Communications

INTRODUCTION

'Medicine' used to be simple, ineffective and relatively safe. Now it is complex, effective and potentially dangerous'[1]. This increased complexity has led to demand for detailed, quality and timely patient records. Research has found that clinicians are increasingly overwhelmed and demotivated by clinical documentation with up to 50% of clinician's time consumed by this task.

This presentation describes the impact of introducing clinical speech recognition into the EMR in two clinical departments in two English NHS hospitals:

1. Renal Department faced an acute shortage of clerical staff with turnaround time (TT) delays for outpatient letters.
2. Emergency Department (ED) wanted to enable the clinical team to stay focused on patient care and improve patient throughput by easing the burden of clinical documentation.

[1] Professor Sir Cyril Chantler, Honorary Fellow, ULC Partners

USE OF TECHNOLOGY AND/OR INFORMATION

Speech recognition is a mature technology that provides a more natural and insightful approach to clinical documentation resulting in a faster, more detailed record while allowing clinicians to spend more time caring for patients.

IMPLEMENTATION/PROCESSES

A clinically driven speech recognition workflow was created, tested and implemented:

- Renal Department: structured OP letter directly in the EMR (Cerner Millennium).

o Outcome:

- Reduced TT reduced from 12 to 3 days.
- Adoption of EMR by clinicians over 80%.
- Improved quality of clinical content.
- Outsourced transcription costs reduced by 77%.
- Need for additional secretarial role avoided.
- More efficient use of clinician's time.
- Patients and GPs received timelier clinical information.

o ED Department: Independent clinician perception study analysed the impact of speech recognition.

o Outcome:

- Over 90% felt speech recognition saved time and improved quality of documentation.
- Using speech recognition was up to 40% faster than handwriting or typing.
- Time savings in documenting care of 3½ minutes per patient - equivalent to gaining two full time ED clinicians over the course of a year.
- Speech recognition is now the preferred method of clinical documentation.
- Reduction in information-related delays and improved speed of communication.

CONCLUSION

Speech recognition has a key role to play reducing the burden of clinical documentation in the acute hospital sector. Each deployment met its objectives. The OP study formed the basis for a business case recommending a

hospital-wide implementation across all clinical specialties (2,500 staff) to meet the national TT target of 7 days. Following the ED department's success, the hospital is planning to expand its roll out of speech recognition.

All healthcare organisations should consider clinical speech recognition integrated into the EMR as a tool for enabling clinical documentation. It improves the quality and timeliness of clinical documentation, accelerates EMR uptake and adoption and frees up clinician time to focus on patient care.

WHAT MAKES YOUR SUBMISSION UNIQUE?

Demonstration of an industrial strength technology that will replace typing and handwriting of clinical documentation over the next 5 years.

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ID 838 - DIGITAL HEALTH IDEA

Transforming patient experience using shared care plans

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INTRODUCTION

Shared care plans are part of our health sector transformation in Canterbury to improve the health and well-being of people with complex health needs.

Patient plans have been written by clinicians for many years. However, they were rarely shared between services and rapidly became out of date.

Our team from the Canterbury Clinical Network (CCN) redeveloped our electronic Acute Plan in 2016 which provides information to health providers unfamiliar with a patient who is experiencing an exacerbation of their condition. Since then, a Personalised Care Plan (PCP) has been released which contains information from the person about what is most important to them at present and captures the patient voice in the clinical record.

USE OF TECHNOLOGY AND/OR INFORMATION

We identified the need to streamline accessibility to shared care plans, moved them to a different IT platform and rolled out the change to clinicians system wide. Prior to this, electronic care plans were difficult to access and could not be amended by all clinicians involved in the patients' care.

IMPLEMENTATION/PROCESSES

We transitioned existing Acute Plans to a new template on our current IT platform in July 2016. The Acute Plan is now widely adopted as a secure, updateable information sharing tool. Now we are in the early stages of implementing the PCP which was released in February 2018. Uptake system wide has been better than we anticipated.

CONCLUSION

The Acute Plan is beginning to be embedded across services and is entering the 'business as usual' phase. We continue to gather and analyse the uptake data from the Acute Plan to identify who is writing or amending the plans and how they are being used. Clinicians are willing to use shared care plans for their patients; however functionality of the tool can have an impact on uptake. We have begun the implementation of the PCP, the development of reporting functionality and the formation of a quality group.

WHAT MAKES YOUR SUBMISSION UNIQUE?

Shared care planning is unique in itself in the way it is being widely used across Canterbury compared to nationally. Shared care planning enables better collaboration between services and supports patient care.

Through our reporting, as well as patient and clinician feedback, we can demonstrate an improvement in patient care and engagement in shared care planning across the Canterbury health care system. The plans have been developed in a way that could be easily adopted both regionally and nationally

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ID 968 - CLINICAL CASE STUDY

Transforming risk into benefits with ePharmacy – MidCentral District Health Board

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1. MidCentral District Health Board

INTRODUCTION

Prior to 2017, our pharmacy department was struggling to operate in a streamlined, efficient and modern way. Staff were contending with five disparate pharmacy management systems, each from a different vendor and holding data in silos. A disproportionate focus was placed on the mechanics of medication provision, which consequently created risk relating to clinical safety, patient outcomes, and productivity. Frustration was part of daily life, and workarounds and duplicate activity became necessary to deliver our pharmacy service. A lack of transparency of stock movements caused high levels of wastage, not to mention it was impossible for the pharmacy to be fully compliant with the Medicines Act 1981.

USE OF TECHNOLOGY AND/OR INFORMATION

A key enabler of digital transformation is a flexible, open platform that is designed for change. We selected DXC Technology's ePharmacy as a single, coherent integrated platform that would enable legal compliance, streamlining of pharmacy services, increased clinical safety, higher staff productivity and better patient outcomes.

ePharmacy comprises of intuitive modular components which cover multiple pharmacy processes, including patient dispensing, extemporaneous dispensing and compounding (enabling a pharmacy to custom-manufacture medicine for a single patient), repackaging, stock control, ward stock, drug files, labeling, reporting and security.

IMPLEMENTATION/PROCESSES

Thanks to a strong partnership between our DHB and DXC, we experienced a smooth and successful go-live of ePharmacy in early 2017. ePharmacy was integrated with other in-scope systems, and staff were trained in the new system. The implementation approach, and the capability of ePharmacy resulted in immense speed to benefit for our pharmacy.

CONCLUSION

While the benefits from ePharmacy have been multifaceted, key outcomes include:

- First year cost savings of NZ$182,000, which is three times the savings originally expected. The majority of this comes from more efficient stock management and delivery.
- 45% increase in the number of prescriptions the pharmacy can now dispense. This has particularly impacted on inpatient services, where most bottlenecks previously occurred.
- Staff morale, and consequently productivity, has improved immensely. Staff now see the system as a useful tool rather than a burden, and can focus on the patient instead of processes.

WHAT MAKES YOUR SUBMISSION UNIQUE?

This case study is an example of rapid speed to benefit, with clear quantifiable results achieved from the digitisation of processes. This implementation is a significant step in the path to a closed loop, end-to-end medication management system, which is a key goal for many of New Zealand's District Health Boards.

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ID 860 - DIGITAL HEALTH IDEA

Uber for Orderlies? Smartpage delivering a more efficient transfer service for our patients

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INTRODUCTION

The previous system supporting task allocation and management for the Orderlies, (level 1/deprox) cleaners and transit care team, was struggling to cope with nearly 400,000 'tasks' each year.

It was a busy system on old, unsupported software and any delays in the system resulted in unnecessary patient delays. A number of efforts were made to try improve performance of the system, but were unsuccessful.

USE OF TECHNOLOGY AND/OR INFORMATION

The objective was to implement a new Orderly task management system to help improve efficiency, patient flow, reduce unnecessary delays, wasted resources and improve communication and visibility across services.

IMPLEMENTATION/PROCESSES

Smartpage was successfully implemented across both hospital sites in November-December 2017 as a complete replacement system for all orderly, (level 1/deprox) cleaning and transit care tasks. We worked with the developer to configure for our needs and test, chose and set up phones, set up all user accounts, had training and communications across all areas and worked closely with the services and departments to support roll-out.

CONCLUSION

In the first 5 months, more than 186,000 tasks were created in Smartpage. The Orderlies, cleaners and transit care team now receive tasks on smartphones. Feedback post implementation is positive, with users saying communication between services has improved (e.g. live updates/progress/photos – knowing who is coming to undertake the task) and that it has helped efficiency, with more tasks being done on time.

We had a tight timeframe for implementation which, due to the amount of users involved, was very ambitious. The service connects everywhere in the hospitals (not just patient care areas) and getting communications to everyone is usually a challenge due to the different staffing/roles all over the DHB. This was taken into account in our strategy leading to a relatively seamless implementation overall.

WHAT MAKES YOUR SUBMISSION UNIQUE?

This was the first time Smartpage has been used for Transit care tasks and cleaning tasks.

We are also currently building a dashboard in our business intelligence tool (QlikSense) to give the service more visual and interactive data for monitoring the performance of the service. This will help to plan resource more effectively, be more responsive to change, and continuously improve.

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ID 947 - CLINICAL CASE STUDY

Using an Electronic Decision Support Tool to Reduce Inappropriate Polypharmacy and Optimise Medicines - When good projects go bad!

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INTRODUCTION

Polypharmacy and inappropriate continuation of medicines can lead to a significant risk of adverse drug events and drug interactions, resulting in patient harm and escalating health care costs.

Thoroughly reviewing patients' medications, focusing on the need for each drug, can reduce the potential for harm. However, consultation time constraints and lack of funding for pharmacy services limits health professionals' ability to perform effective medicine reviews in practice.

USE OF TECHNOLOGY AND/OR INFORMATION

We aimed to overcome these problems by designing an automatic electronic decision support tool (the medicines optimization/review and evaluation (MORE) module) that is embedded in general practice electronic records systems. The tool was to focus on medicines optimisation and inappropriate polypharmacy reduction by automatically reviewing medicines and providing advice to prescribers on changing or stopping unnecessary/inappropriate medicines.

This project was funded through a HRC partnership grant, linking an academic research team with a commercial health IT team.

IMPLEMENTATION/PROCESSES

The academic team successfully developed the clinical rules and interventions using an expert delphi method and helped develop the specifications to convert these rules into a decision support tool. Due to limitations in technical know-how, costs and time, adaptation of these rules into a functioning module has not yet occurred.

Phase four was to be a small community-based, single-blind, prospective, 6-month controlled trial involving two interventions and two matched control general practices.

CONCLUSION

Rather than having a linear process of development (research, specifications, developers, testers, implementation). It would have been far more effective and time efficient to have a hub style process with members from each 'team' working together at the same time. Too much time was taken developing specifications that required multiple reiterations following each round of testing/implementation. There were also major delays waiting for job 'tickets' to be actioned for the required changes to be made. Many essential clinical changes were often met with resistance and seen as scope creep. Our advice is not to waste time on specs and development documents, just do it!

Partnership funding did not work, having a dedicated paid programmer working with the team would have been advantageous.

WHAT MAKES YOUR SUBMISSION UNIQUE?

Very little focus in research is given to projects that fail or do not quite reach their full potential. We have highlighted areas where improvement can be made to ensure IT solutions are translated into practice.

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ID 957 - DIGITAL HEALTH IDEA

Using Machine Learning for Bed Management – Integrating a Predictive Model for Elective Surgical Cases into Care Planning

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2. iVise

INTRODUCTION

Bed shortage is an increasingly common reason for elective surgery cancellations. Limited inpatient bed supply is becoming the bottleneck in our hospitals, particularly over winter when acute medical admissions are highest, causing disruptions to elective surgery schedules, poor utilisation of theatre time and undesirable patient experiences. To date, forecasting the number of beds needed has relied on staff judgments. There is potential to improve this using existing data.

USE OF TECHNOLOGY AND/OR INFORMATION

We developed a model to predict length of stay for elective surgery cases which used patient data known prior to admission including procedure type, ASA grade, CCL and a recency factor. The predictions are saved to our data warehouse daily and a Qlik (data visualisation) Dashboard shows clinicians the number of beds expected to be filled each day given their planned surgery date. Actual data is then used to update the model each weekend, meaning predictions should become more accuracy over time.

IMPLEMENTATION/PROCESSES

The model and visualisation were established through a close collaboration between a DHB data analyst and a data scientist. Three years of surgical data was used to develop two models using a random forest and extreme gradient tree-boosting algorithms. The final prediction is weighted equally across the two models. Various potential predictive variables were tested to refine the model. We built a benchmark prediction using averages per procedure type while removing outliers to compare against the performance of our multivariate model. The accuracy of the multivariate model is high: 77% of predictions in the test data sample were exact to the day (compared to 65% in the benchmark model), and 96% were within 2 days. The DHB data warehouse team enabled regular updating of the model and storage of model results.

CONCLUSION

The collaboration of a data analyst who has in-depth knowledge of surgical processes and data with a iVise senior data scientist produced a working model in a few weeks. The project was considered a success only when data updates and visualisations were updated automatically and available to the service on demand.

WHAT MAKES YOUR SUBMISSION UNIQUE?

This model has been successfully integrated into daily bed management at our hospital. The use of machine learning – continuous updating of the model based on new data each week – has no published precedent in New Zealand hospitals for daily bed management.

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ID 853 - CLINICAL CASE STUDY

Using technology to improve quality and efficiency in General Practice

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INTRODUCTION

Primary healthcare and General Practice has evolved rapidly in the last 20 years. The world is profoundly different than even a few years ago, thanks to global interconnectivity, social media and medical services over the internet.

General practice is also responding to increased complexity of care and working in an increasingly integrated manner with other health care professionals.

Pegasus Health is a Christchurch-based Primary Health Organisation providing services to over 300 General Practice members and an enrolled patient population of 430,000. We aim to deliver quality health care to patients and improve health outcomes for our community.

In 2015 Pegasus Health recognised the need to enhance technology to support the aspirations of our members and improve the patient experience. We began a journey to develop a General Practice software system that would align technology to our rapidly changing sector, taking into account: changes to care delivery including integrated care teams, patient engagement, an aging GP population and increasing demands on General Practice.

USE OF TECHNOLOGY AND/OR INFORMATION

For two years Pegasus sought feedback from the medical technology vendor market (local and international) and engaged in a rigorous process to select a technology platform that could help General Practice improve efficiency and patient outcomes.

We worked with our members, our patients, and our community to select a vendor that could help Pegasus configure a software platform to meet local needs.

IMPLEMENTATION/PROCESSES

Pegasus engaged our members, our patients, our community, and health experts to identify how technology could improve the patient experience. This process was clinically-led and focused on meeting the needs of users working in our unique Canterbury environment. We used an agile methodology in designing and building several iterations of the product, enhancing each build based on feedback from our end users. Our team provided input to the design process and interfaces to ensure the software was easy to use, intuitive, simple, allowed clinicians to access the right information at the right time and was data compliant. Our product encourages a patient-centred approach to General Practice.

CONCLUSION

A new way of thinking was required inside the organisation to ask the end users (clinicians and patients) what would make their experience better. We looked outside of the box to create our own technology product that is fit for purpose and future proof.

The work required to align the software with other systems, and customise it to our end users was greater than expected, but so too was the positive impact.

WHAT MAKES YOUR SUBMISSION UNIQUE?

Pegasus undertook a holistic approach to the challenges of a changing and evolving primary care environment, and the unique challenges in the Canterbury health sector. This was not focused on just developing a Patient Management System, but creating a platform that could allow an integrated set of technologies to support improved quality and efficiencies. This required a new way of thinking, a new set of tools and new capabilities.

Pegasus has over 300 GP members working within 84 General Practice teams and the investment and foresight to align and position such a group has been enormous and rewarding.

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ID 943 - CLINICAL CASE STUDY

Waikato Teledermatology Suspected Skin Cancer project

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2. HealthShare Ltd

INTRODUCTION

The majority of skin cancer diagnosis and management occurs in primary care in New Zealand. Experience and knowledge about skin cancer amongst general practitioners varies. Teledermatology, specifically teledermatoscopy, uses experts to triage suspicious lesions given high-quality images, relevant history, and examination findings. Earlier Waikato teledermatoscopy projects have confirmed diagnostic accuracy and a reduction in unnecessary excisions, resulting in reduced outpatient appointments, patient morbidity, inconvenience and intitutional/ patient costs. Rapid response is educational to referrers, reduces patient anxiety, and for confirmed melanoma, improves compliance with Ministry of Health's Faster Cancer Treatment targets. Sustainability of our projects was hampered by lack of integration with referrer and hospital patient management systems, and absence of funding.

USE OF TECHNOLOGY AND/OR INFORMATION

Due to the limitations of our existing teledermatoscopy services, we decided to explore the use of the District Health Board's usual electronic referral system implemented by BestPractice.

IMPLEMENTATION/PROCESSES

After determining that skin lesion referrals using the existing generic template did not adhere to teledermatology quality standards, a specific Teledermatology Suspected Skin Cancer "Advice only" referral form was added to the existing BestPractice pathway to Dermatology 1 July 2017. Referrers were encouraged to purchase suitable cameras and dermatoscopes and to access online training. Any member of the primary care team can take up the training and role of image taker, increasing their skill base.

Data from the 6-month pilot (348 referrals) are undergoing clinical audit and review to determine adherence to teledermatology quality standards, image quality and devices used, costs to the organisation, speed of response (99% were reported within 4 working days), and outcomes, including diagnostic concordance with histology, where this is known.

We plan to survey users to determine the financial burden on general practice to purchase suitable equipment, their training, whether they imposed extra fees on patients, and the barriers to participation they experienced.

The Ministry of Health requirements for processing referrals have impeded innovation, development and funding of the service, but it is continuing due to enthusiastic uptake by referrers. Planned enhancements to the interface should reduce time taken to refer and report each case, and enable data collection for training, research and machine learning applications.

CONCLUSION

The Waikato teledermatology suspected skin cancer service is innovative and highly cost effective. There have been many barriers to its implementation, but primary care referrers, dermatologists, and patients are extremely happy with the new service

WHAT MAKES YOUR SUBMISSION UNIQUE?

We have demonstrated an effective implementation model of teledermatoscopy using affordable, easily accessible technologies that can be replicated across the region.

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ID 834 - CLINICAL CASE STUDY

"Webside manner" - telepresence robotics in routine clinical care

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INTRODUCTION

Telepresence defines the use of technology to allow apparent participation in distant events.

USE OF TECHNOLOGY AND/OR INFORMATION

The Double telepresence robot, sold by Double Robotics since 2013, traditionally focuses on telecommuting for business and education. It's impact in healthcare is not well described.

IMPLEMENTATION/PROCESSES

We conducted multi-modal impact assessment following the introduction of the Double 2 telepresence robot into routine clinical care at Thames Hospital. The aims were i) to establish the technical, administrative and staff-training resources required to safely deploy the robot in a clinical environment and ii) to assess the impact of telepresence technology in routine interactions with Thames-based patients and clinical teams. We made use of a modified version of the MARTA methodology (Multidimensional Assessment of telepresence RoboT for older adults) described by Cesta et al.

CONCLUSION

The Double 2 telepresence robot can be safely embedded into routine care if its limitations are well understood and attention is paid to supporting and educating staff, patients and caregivers. The technology is highly acceptable to patients and allows remote specialist staff to interact with patients at their bedside.

WHAT MAKES YOUR SUBMISSION UNIQUE?

This is the first description of a telepresence strategy being used to enhance clinical care in a New Zealand hospital system.

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ID 803 - CLINICAL CASE STUDY

"What matters to you, should matter to us"- The challenges of implementing e-Shared Care in Northland

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INTRODUCTION

There is overwhelming evidence that patient centred care planning leads to better patient outcomes and better patient experiences. Ministry of Health and Regional IS/Capital Planning documents repeatedly state that care planning is a priority for the future. Northland has been trying to implement e-Shared Care for the last 2 years and we have encountered challenges outside of the purely technical/IT sphere which are just as important to acknowledge and discuss

USE OF TECHNOLOGY AND/OR INFORMATION

Patient held paper care plans don't work. Northland wanted to implement an e-Shared Care plan which was accessible to patients via a portal and to all health providers who the patient chose to have as part of their care team. The tool the Northland and the Northern region has chosen for e-shared care is Whanau Tahi.

IMPLEMENTATION/PROCESSES

In Northland we enrolled our whole population to allow a summary view of basic health information for all Northland patients to be available to all registered providers. This allowed secure messaging for all patients and e-shared care planning that could be started and added to by any provider in Northland. This was and still remains a technical challenge.

CONCLUSION

Implemented e-Shared Care planning isn't just "another IT project". It's a process of trying to change the entire paradigm of care, so faces the sociological and philosophical challenges of persuading overburdened and change resistant providers that "what matters to patients, should matter to them". The process has been hampered by a disconnection between the stated desire of the Ministry and Regional planners to implement shared care and giving the implementers adequate resourcing to have a chance of success.

WHAT MAKES YOUR SUBMISSION UNIQUE?

Our presentation spans the continuum from patients, providers, IT services right through to central decision makers. It exposes the challenges that complicated, but important, service delivery changes present to the sector. It's a frank and honest story of how hard it to implement IT tools in the face of technical and political challenges and concludes with how these might be better addressed. The speaker is a clinical and IT leadership background and has been knee deep in this work for several years.

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ID 806 - DIGITAL HEALTH IDEA

Where interRAI data comes alive

Michelle Liu[1], Michele McCreadie[1]

1. TAS

INTRODUCTION

Aged residential care providers and District Health Boards are starting to see real value from their efforts with interRAI assessments.

Throughout New Zealand, assessors in District Health Boards and in aged residential care facilities use the standardised interRAI assessment instruments to help determine the level of support required for clients and residents over 65 years old.

USE OF TECHNOLOGY AND/OR INFORMATION

In December 2017, the interRAI service team, based at TAS, launched a data visualisation tool.

This visualisation runs on Microsoft Power BI. The interactive nature of this tool means the user is in control of the information and can select the level of detail they desire.

IMPLEMENTATION/PROCESSES

The visualisation tool gives users access to a wealth of data, which is already being used for policy and service development, research, quality improvement and more.

CONCLUSION

Michele McCreadie, General Manager interRAI Services, will give a short demonstration of the Data Visualisation tool and take your questions.

WHAT MAKES YOUR SUBMISSION UNIQUE?

New Zealand is the first country in the world to use the interRAI suite of assessment tools nationwide within a single national software platform. The function of the single national software platform is to provide information sharing and access to real time data in a centralised and secured system allowing for increased visibility, efficiency and seamless patient care across different care settings. The Data Visualisation tool makes this information more accessible and user-friendly than ever, it adds value across the health sector,to researchers and the general public.

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