CONFERENCE PROCEEDINGS
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SFT-18 Keynote Presentations
Keynote Address

Tuesday 23 October 2018, 8:55AM
Professor Branko Celler
University of New South Wales, Australia

Professor Celler is internationally recognised as an innovator and pioneer in the development and use of biomedical software and instrumentation for the telemonitoring of chronically ill patients at home. He was Head of School of Electrical Engineering at UNSW for nine years and established the Biomedical Systems Laboratory which was successful in winning more than $15M in competitive grants. He has an abiding and on-going interest in supporting health and socio-economic development of rural and remote communities through the smart use of ICT. Prof Celler has previously held positions as Executive Dean of the College of Health and Science at Western Sydney University and Chief Scientist at the CSIRO ICT Centre. He is a Fellow of the IEEE and a Fellow of the Australian Academy of Technological Science and Engineering and an inaugural Fellow of the Australasian College of Health Informatics. He has published more than 200 journal articles and refereed conference proceedings. In 2006 Prof. Celler established a start-up company TeleMedCare Pty Ltd which now operates internationally and is respected for its innovation and excellence in telehealth. Whilst Chief Scientist at the CSIRO ICT Centre, Professor Celler led the $5.4M CSIRO National Telehealth Project, the results of which have been published internationally and which are now contributing to the development of national policies on the large scale deployment of telehealth services. Professor Celler is an Emeritus Professor and an active researcher at the University of New South Wales.

Presentation Title: The definitive summation of the results of the NBN CSIRO telehealth trial and their policy implications
Lawrence works for Health Support Queensland (HSQ) within Queensland Health as Director of the Radiology Informatics Support Unit. Lawrence holds a PhD in medical physics and previously worked as Director of Physical Sciences at Princess Alexandra Hospital before moving into the area of radiology informatics support in 1999 – first as manager of the PACS implementation team and then as Manager of PACS Support. Lawrence joined HSQ in 2008.

Lawrence’s professional experience complements his academic training and has supported development of expertise in the areas of medical physics, medical devices, PACS/RIS and technology planning to support clinical services provision.

His research interests include monitors for radiological image visualisation and diagnosis. His present focus is enterprise radiology informatics systems and how radiology informatics, as part of integrated healthcare record infrastructure, offers hospitals and healthcare networks improvement opportunities for cost/effective outcomes and quality healthcare delivery.

Presentation Title: ARTIFICIAL INTELLIGENCE: The Hype and the Hope

“Artificial Intelligence” (AI) is an umbrella term for a range of computer science-based activities that are undergoing a modern renaissance. The concept of AI can (arguably) be traced back to antiquity - but what is it really? What is involved?

Are we at the start of AI transformation or the brink of apocalypse? Will it be disillusionment or utopia? Is AI really going to change the world? Has it already? … and what sort of outcomes are likely, what impact will AI have?

In this presentation a Non-Expert observer/consumer of AI-enabled services will explore the field of Artificial Intelligences and take a closer look at some AI techniques (e.g. neural networks, machine learning) that are impacting medicine in diverse fields including diagnostics and clinical decision support, imaging (cardiology, dermatology, ophthalmology and radiology), pharma (drug discovery and precision medicine), and robotics.

The presentation will conclude by examining some predictions for the impact of AI in healthcare.
Workshops
Developing a Telehealth Multidisciplinary Team (MDT) Meeting Between Metropolitan and Regional Cancer Groups – Success and Challenges

Wei-Sen LAM¹, Melissa PANUCCIO¹, Ali HOOPER¹

1. WA Country Health Service, Western Australia, Australia

Cancer multidisciplinary care meetings have been shown to improve clinical outcomes, streamline referrals, provide collegial and educational support and provide best care for patients. Major tertiary metropolitan hospitals have specialty resources that are often not available in regional and rural hospitals/medical centres. Embedding the use of video conferencing into MDT meetings held at metropolitan centres enables rural clinicians’ access to specialist expertise care in real time.

The Thoracic Oncology MDT meeting held at Fiona Stanley Hospital uses telehealth videoconferencing technology to link in with Bunbury Regional Hospital on a weekly basis. Running these MDTs via telehealth allows the respiratory physicians and radiation oncologist in Bunbury to present complex lung cancer cases from the region for discussion to enable them access to a consensus on the best treatment recommendation for rural and remote patients. However, with these positive outcomes there have been challenges incorporating regional hospitals into other MDT meetings for other tumour streams.

Some issues raised at the regional end include:
• Lack of engagement from the metropolitan site in including regional patients for discussion
• Lack of interest from clinicians in regional sites to participate in metropolitan meetings
• Small number of regional patients to present for review
• Difficulty in communicating with metropolitan clinicians during the meeting; videoconferencing etiquette/scheduling needs to be addressed
• Poor sharing of information before, during and after the meeting; relating to sharing medical records etc.

To overcome these barriers there is the plan to engage with the key regional and metropolitan stakeholders to help promote the use of telehealth within MDT meetings. There is also a need to educate MDT members about telehealth etiquette e.g. only one person speaking at a time, acknowledging regional clinicians and discussing regional patients at the start of the meeting. Resources are also required to provide the infrastructure to allow regional clinicians to link into a teleconference.

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Beyond the Clinic: Transforming Your Practice with Video Consultations

Silvia PFEIFFER

1. Coviu Global Pty Ltd, New South Wales, Australia

The purpose of this workshop is to provide healthcare professionals with ideas for transforming their business for a digital future. It is a guide on how to successfully introduce video consultations into a healthcare business. The goal is to create more flexibility for patients and clinicians and also to make more money along the way by transforming the business sustainably.

It is very clear that digital is going to substantially disrupt the way healthcare works and telehealth is one substantial aspect of it. Telehealth projects have been run for many years and their clinical effectiveness has been proven. With the availability of bandwidth, affordable high-definition hardware and highly flexible, workflow-aware software, now is the time for telehealth to become a standard way of delivering healthcare.

As the founder of Coviu, a video consultations solution provider, I have worked with many healthcare businesses and seen many successful digital transformation projects, but also many projects that failed. I can provide realistic advice for practice owners on every aspect of the transformation process from idea through service design, training, pilot introduction, all the way to business-as-usual.

Practice owners don’t know where to start, what pitfalls to avoid, what process to follow, and how to make it work financially. There are very practical concerns about how to deal with appointment bookings for online consultations, how to manage health records, how to deal with patient privacy, how to deal with payments, how to avoid delays and frustrations caused by technology and network issues, as well as how to get everyone on board and train them appropriately.

My goal with this workshop is to provide a framework that helps practices navigate the pitfalls of introducing video consultations successfully, from a pilot project through to a scalable new service offering.

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Fundamentals of Telehealth Evaluation

Maike NEUHAUS¹, Danette LANGBECKER¹

1. The University of Queensland, Queensland, Australia

This workshop is for those interested in the key elements to consider when evaluating a telehealth service. Topics will include how to formulate robust evaluation questions, why to use an evaluation framework and which frameworks to consider, and the different types of data you can collect to answer your questions.

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Telehealth Basics: New to Telehealth?

Maike NEUHAUS¹, Liam CAFFERY¹

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This workshop will cover basic concepts in telehealth, such as what telehealth is, what its drivers are, and the modalities used to deliver telehealth. You will also learn some practical considerations to improve your telehealth etiquette and optimise the way you hold a videoconference.

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Oral Presentations
mHealth Adoption Factors for Patients in the Developing World: A Structural Equation Model

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There are many innovative models with their associated instruments for measuring patient’s adoptability of mHealth in the developed world, but none of these models provide a comprehensive framework for addressing critical issues affecting a patient’s adoption of mHealth in the developing world. The aims of this paper are to construct a reliable and valid assessment instrument and use it to develop a structural model showing relationships both between and among latent variables for patients’ mHealth adoption in the developing world. A Patients mHealth Technology Adoption Scale (PmTAS) was developed with data from 585 mothers who had previously been on Mobile Technology for Community Health (MoTeCH) system deployed in the Awutu Senya East and West districts of the Central Region of Ghana. A simplified cluster sampling technique was used to randomly select mothers who had used MoTeCH from 9 clusters of 64 mothers each, between June-October 2017. The instrument is made up of 39 items, grouped under 8 constructs namely: system usefulness; available infrastructure; collaboration and funding; user characteristics, cost and ownership, stewardship; intention to adopt; training, language and literacy. The study provides an instrument and its accompanying structural model with strong evidence among latent variables for patients’ adoption of mHealth in the developing world.

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Telehealth Clinical Reviews for Renal Transplant Recipients in a Tertiary Centre

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1. Royal Melbourne Hospital, Victoria, Australia
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Royal Melbourne Hospital (RMH) performs more than 140 renal transplant operations per year. Approximately half of all transplant recipients live in regional areas in Victoria and southern New South Wales. Renal transplant recipients require ongoing and regular medical review, and for regional patients, this can result in loss of time and costs travelling to a tertiary service and an ever-increasing demand on hospital outpatients' service. The Royal Melbourne Hospital (RMH) renal transplant unit initiated a telehealth service in May 2016 to provide cost effective, patient-centred clinical care for regional patients. This has grown into an established dedicated renal transplant telehealth clinic option.

Since its beginning, 230 clinical reviews have been conducted via telehealth. This has saved patients 189,005 kilometres in travel distance, which is equivalent to 4.7 trips around the circumference of the world; 2621 hours (109 days) in car travel time, equivalent to $28,880 petrol savings; and 57.6 tonnes CO2 equivalents of greenhouse gas emissions, equivalent to planting 1229 seedling trees and growing them for 10 years.

Lessons learnt during this process have been to provide a model of telehealth clinical review which allows patients to use a computer, tablet or mobile phone for access from their home, work or university, or the option to link through from their local health service providers also developing local expertise for our transplant patients. Secondly, the incorporation of a telehealth service for transplant patients as part of the outpatient system has been achieved within the existing workforce, involving a dedicated team effort from the RMH telehealth team, outpatient staff and nephrology clinicians. The renal transplant telehealth clinic has been successful in the way we manage patient care. The next step is to compare clinical outcomes with renal transplant patients reviewed in person.

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Co-designing with Carers of People with Dementia Using Group Videoconferencing

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The disease burden of dementia is continuing to grow in Australia and is expected to reach over 500,000 people by 2025. In rural Australia, knowledge and utilisation of support by informal caregivers of people with dementia (PWD) is lacking. Research suggests that socio-emotional support from family and friends play an important role in sustaining caregiving activities. In addition, these support networks assist in the successful transition through the post-care period and adjusting to changes in role and grief. Rural areas are disadvantaged in accessing traditional face-to-face support groups and using group videoconferencing (VC) may overcome known barriers. Trials of providing caregivers support programs by VC indicate encouraging results but few, if any, have been implemented in rural Australia. This project will combine the evidence from two recent research projects (TeleHealth Literacy Project and After the Dementia Carer Journey Has Ended) to collaboratively co-design and evaluate a facilitated VC peer support and information program to carers of PWD within rural areas. The study will be a mixed methods repeated measures randomised wait list design, with primary outcomes of self-efficacy, quality of life and mental health and secondary outcomes of perceived social support and user satisfaction with the technology and intention to continue use. Participants will be recruited through the Community Care Smart Assistive Technology Collaborative platform and providers. To develop the intervention carers for PWD will be recruited to take part in a series of co-design workshops. An evidenced-based co-design framework will be developed utilising strategies such as pathway and experience mapping, vignettes, problem and solution ranking and reflection on health literacy and service needs. The project will utilise off-the-shelf technology rather than customised solutions. A focus of the project will be understanding IT and IT support requirements for delivering group VCs.

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Successful eHealth Coaching Requires an Empathic Relationship: Qualitative Interview Study

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Background
Success with lifestyle change, such as weight loss, tobacco cessation, and increased activity level, using eHealth has been demonstrated in numerous studies. Recent studies indicate that weight loss can be achieved and maintained over 12 and 20 months in a primary care setting using a collaborative eHealth tool.

Aim
To analyse how healthcare professionals perceive eHealth coaching and to explore what influences successful long-term lifestyle change for patients undergoing hybrid eHealth coaching using a collaborative eHealth tool.

Methods
Ten female healthcare professionals were recruited by purposive sampling. They were aged 36 to 65 years with a mean age of 48 years, all had more than six months of experience providing eHealth lifestyle coaching using a combination of face-to-face meetings and asynchronous eHealth coaching. We performed individual, qualitative, semi-structured, in-depth interviews in their workplace about their experiences with health coaching in relation to lifestyle change, both for their patients and for themselves, and particularly how they perceived using a collaborative eHealth solution as a part of their work.

Results
The healthcare professionals all found establishing and maintaining an empathic relationship important and that asynchronous eHealth lifestyle coaching challenged this compared to face-to-face coaching. The major reason was that unlike typical in-person encounters in healthcare, they did not receive immediate feedback from the patients. We identified four themes important to the healthcare professionals in their asynchronous eHealth coaching: (1) Establishing an empathic relationship, (2) Reflection in asynchronous eHealth coaching, (3) Identifying realistic goals based on personal barriers, and (4) Staying connected in asynchronous coaching.

Conclusion
Establishing and maintaining an empathic relationship is probably the sole most important factor for successful subsequent eHealth coaching. Going forward, the quality of the patient-healthcare professional interaction will need attention if patients are to fully benefit from collaborative eHealth coaching.

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Managing Long Term Conditions Using Telehealth

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Approximately 15 million people in the UK have a long-term condition and their management is one of the greatest challenges facing the National Health Service (NHS) today. To overcome this challenge, NHS Halton & St Helens Primary Care Trust in Widnes conducted a 12-month pilot to evaluate the benefits of embedding telehealth within its care pathways for people with long term conditions.

A total of 60 telehealth packages were commissioned from Tunstall Healthcare and offered to patients from three chronic disease areas – heart failure, COPD (chronic obstructive pulmonary disease) and stroke.

Telehealth systems are set up in the individual’s home, and patients are given training on Tunstall mymedic unit and associated peripherals to monitor their vital signs and symptoms. Each day, patients take their own vital signs and answer a series of health-related questions which is automatically transmitted in real time down the phone line, via the mymedic unit, to Sefton Careline’s monitoring centre. Here, operators use a triage software platform to manage the data received. Clinicians work with staff at Sefton Careline to set up a record for each patient which includes contact details and information on their medical condition and contains parameters for each patient’s readings. If these parameters are exceeded, operators will receive an alert, and can contact the patient to request that they retake their readings.

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Diabetes Self-Management: The Relationship Between mHealth Adoption and Self-Efficacy

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Previous research shows that mHealth adoption can facilitate self-management behaviour and improve health outcomes for individuals diagnosed with type 2 diabetes. However, less is understood about why some people are more predisposed to utilising mHealth for self-management than others.

The disparity that exists in digital equality within society, referred to as the digital divide, is well established. However research into the digital divide alone does not hold the key to understanding engagement with mobile technology from a healthcare perspective. Successful and sustained mHealth engagement can be very difficult for some individuals to achieve, despite the fact that they may utilise the functionality of mobile devices and apps for other reasons in their everyday lives.

This research investigated whether individuals who have been diagnosed with type 2 diabetes, and who use mHealth to facilitate their self-management regimes, share common attributes in terms of behaviours or self-discipline that can predict mHealth engagement.

A total of 382 people who have been diagnosed with type 2 diabetes completed online surveys that quantified the types of mobile devices they use, as well as their frequency of digital engagement and level of mHealth adoption. Self-efficacy, multidimensional health locus of control, digital literacy and online health information seeking behaviour were also measured.

Quantitative analysis revealed strong correlations between self-efficacy and mHealth adoption to facilitate self-management. Online health information seeking behaviour on mobile devices was widespread among the participants, and this conduct also correlates to successful mHealth engagement.

Although digital literacy and the availability of online access are clearly essential elements of mHealth adoption, they are not sufficient in isolation to trigger engagement with mobile devices to enhance health outcomes. However an individual's self-management self-efficacy is a key component of successful mHealth adoption, to facilitate the self-management of type 2 diabetes.

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Connecting the Dots – Diabetes Telehealth Service, Supporting Women with Gestational Diabetes Mellitus in Regional Western Australia

Mandy CHAN¹, Christine CARNE¹, Gill DENNY¹

1. Diabetes WA, Western Australia, Australia

Introduction
The Diabetes Telehealth Service (DTS) recognises the service gaps in local antenatal care pathways for women with Gestational Diabetes Mellitus (GDM) in regional Western Australia (WA), and offers access to Credentialled Diabetes Educators (CDEs) via multiple video conferencing (VC) platforms. The service supports usual care delivery for regional women, facilitating timely access to GDM monitoring data, and mitigating care burdens without compromising maternal and foetal outcomes. Care is coordinated through networks with local health professionals (HPs), sharing clinical information throughout the multidisciplinary health team to provide gold standard care for women with GDM without the need for extensive travel.

Method
Women are contacted via video or telephone for initial education on GDM within 24 hours of the DTS receiving a referral. By offering prompt and frequent face to face contact women are empowered to acquire self-management skills essential for a healthy pregnancy as early as possible. Timely referrals are also made to Nurse Practitioner-led VC insulin initiation services at King Edward Memorial Hospital. This allows for early intervention and treatment options for women whose blood glucose levels are outside the optimal range. CDE consultations are conducted 6 weeks post-delivery to discuss prevention strategies aimed at lowering their risk of Type 2 Diabetes later in life.

Results
To date, the DTS has provided 127 occasions of service to women with GDM, which has saved a total of 70,943 kilometres of travel. The service proactively contacts local HPs to offer consultations with a CDE, resulting in a 37% rise in GDM referrals from January 2018 (total referrals to DTS now equal 32, including 8 from priority populations).

Lessons Learnt
In regional WA where distances are vast, and access to specialised HPs is limited or overburdened, the DTS is a practical option for women with GDM.

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Improving Access for Aboriginal People with Chronic Diseases Living in Regional/Rural/Remote Areas, to Specialist Medical Care via Telehealth

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Hunter New England Local Health District (HNELHD) is striving to address the high prevalence of chronic health conditions facing our Aboriginal population through an innovative model of telehealth service delivery. HNELHD encompasses a large geographic area of NSW, approximately 132,000 square kilometres. It incorporates a major metropolitan centre with regional, rural and remote communities within its boundaries. Aboriginal people make up 6% of our population. Importantly, this is 35% of the NSW indigenous population, and 10% of the total Australian Aboriginal and Torres Strait Islander population. As a district we have a responsibility to be a leader in creating models to enable improved healthcare.

To meet the needs of our population, the HNELHD Integrated Chronic Care for Aboriginal People Program (ICCAPP) is providing a flexible, timely and accessible model of telehealth to the patients in their care, linking with specialist services at John Hunter Hospital in Newcastle. This model brings together modern telehealth technologies with the local understanding of rural/remote Aboriginal communities across the LHD.

The telehealth clinic occurs where the patient is situated, via a virtual meeting room which is facilitated at the patient-end by the ICCAPP CNC and AHW. This is a weekly clinic, unique in that patients are promptly assessed by the ICCAP CNC for telehealth, therefore reducing delays in accessing specialist input. There are five ICCAPP nurses across the district linking their patients into this weekly clinic.

The ICCAPP CNCs and AHWs can opportunistically select patients and have them seen for a range of specialist services in an ad hoc, rapid access clinic approach. Distance and waiting time barriers are essentially eliminated and specialist health care recommendations can be acted on immediately by ICCAPP clinicians. Patient feedback is of renewed trust and confidence in service delivery, and the CNCs are witnessing improved patient outcomes and healthcare literacy.

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The Use of Telemedicine in Bariatric Surgery Healthcare: A Literature Review

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Summary
Bariatric weight loss surgery is one of the most effective treatments for severe obesity. Access and delivery of healthcare support pre and post-bariatric surgery has been shown to increase short and long-term lifestyle and behavioural change and improve weight loss outcomes in people that undergo bariatric surgery. The delivery of face-to-face support has been examined in previous research, however little is known about the use of telemedicine as a novel approach in bariatric surgery support.

Aim
The aim of this study was to explore the available literature on the use of telemedicine for healthcare support of bariatric surgery patients.

Methods
Six online databases were used, namely, PubMed, EMBASE, CINAHL, PsycNET and SCOPUS. Review methods were in accordance to PRISMA guidelines. Inclusion criteria were original research (observational studies, randomized controlled trials and feasibility studies) in adults ≥18 years of age, and published in peer-reviewed journals. Conference posters, abstracts, reviews and unpublished theses were excluded. Keywords: bariatric surgery, telehealth, telemedicine, mHealth, mobile devices.

Results
Database search returned 258 references and of these a total of 10 studies were included in the review. Six assessed feasibility for patient and/or healthcare providers usability and acceptance, and/or weight loss, physical activity, diet/eating or behavioural change. Two studies were randomised controlled trials, however only one showed a difference in outcomes between intervention and usual care. Two observational studies showed a difference in various outcome measures (weight loss, lifestyle and behaviours, retention of knowledge and psychological parameters).

Conclusions
There is insufficient evidence to reach a firm conclusion about the clinical benefits of using telemedicine in bariatric surgery care and it remains an area for future investigation.

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A Patient-Centred Survey of User-Experience in Neurological Consultations by Telemedicine

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Aim
Approximately 15% of general practitioner consultations involve patients with neurological conditions, requiring expedited assessment by neurologists to reduce poor clinical outcome. Access to neurologist review is limited in rural areas, possibly leading to harmful delay. Telehealth consultations to overcome this access gap are not new. However, the knowledge of user-experience in telehealth is lacking to support decisive adoption of this model. We conducted a case-control survey of patients and clinicians to investigate telehealth user experience and the impact appointment wait times has on patients’ neurological condition.

Methods
We recruited patients, including those who had previous exposure to telehealth and those without, from rural locations with neurological conditions diagnosed from 2012 to 2017 by invitation letters to clinics. Interviews were conducted via telephone or in person. The survey contained questions which included user experience and time delay to access neurologist consultations. We hypothesise that the user experience of telehealth is non-inferior to face-to-face neurologist consultations and the time delay access including its direct impact on neurological condition for telehealth consultations are non-inferior to face-to-face consultations.

Results
56 patients were included. Median age was 62.0 years (IQR=21.0). 68.0% were female. 27 patients were in the case group (telehealth) and 29 in the control group.

We found that the user-experience of telehealth was non-inferior to face-to-face neurologist consultations. There were also non-inferior time delay access to neurologists between the two groups for second subsequent appointments (p<0.05): that is, 45.0% of case group patients waited less than 1 month vs 53.3% control group patients. 25.0% of patients waited between 1 and 3 months vs 13.3% in the control. 15.0% of patients waited between 3 and 6 months vs 20.0% in the control. 15.0% of patients waited over 6 months vs 13.3% for the control group.

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Embedding Sustainable Statewide Telehealth in Rehabilitation

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In 2017, SA Health made a commitment to embed telehealth as part of an integrated strategy for reforming rehabilitation services across the state. To support implementation of the strategy, Statewide positions as well as “at the elbow” support teams in each of the four adult local health networks (LHNs) were established and links with the SA Digital Telehealth Network were strengthened. Videoconference capabilities at each LHN were upgraded and a fleet of 4G enabled iPads were purchased for loan to consumers.

Telerehabilitation is utilised in the therapy context to support the consumer’s care plan, identified goals, and assists in increasing access and intensity of rehabilitation programs. The use of mobile devices means that services can be provided to consumers throughout their journey from hospital to home. Telerehabilitation in the consumer’s own home allows therapy to be provided in a context meaningful and appropriate to the individual, and results in reduced travel time and improved timeliness of services. Telerehabilitation encompasses a variety of clinical services and applications across the multidisciplinary team including individual therapy, group therapy and education, increasing therapy “dosage” via apps, medical consultation and review, ambulatory and inpatient services.

To date, feedback from consumer surveys indicates that telerehabilitation is well received and monitoring of activity shows significant statewide growth in telerehabilitation non-admitted patient occasions of service. Our presentation explores our journey in successfully embedding telerehabilitation into everyday practice across multiple, multi-faceted settings. We have learnt that to ensure system-wide sustainable change, we need to understand that organisations are complex social constructs. Implementation of new and evolving models of care involves change leaders considering both the subjective and objective elements that impact human behaviour, individually and collectively, and that balancing the polarities between the need for statewide consistency and local flexibility is essential.

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Expect the Expected! The Use of Virtual Reality (VR) to Address Fear and Anxiety

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Although many see Virtual Reality (VR) headsets as a tool for gamers or a gimmicky toy, the use of VR headsets has been used to provide education and training in a number of fields, including health. Globally, the virtual environment has been used to train and educate surgeons, manage and treat mental health disorders and used clinically in reducing procedural anxiety and perceived pain scores. The MLHD has begun working on the use of VR headsets to record areas of elevated anxiety for both patients and carers. By recording 360 video/images of theatres, medical imaging suites and other clinical areas, patients can experience the environment in an immersive environment that allows them to ask questions and address fears prior to the procedure itself. This also allows clinicians to provide the best possible treatment and management of patients as their levels of anxiety and fear are lower.

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It’s Important, But Not Important Enough: eHealth as a Curriculum Priority in Medical Education in Australia

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Information and communications technology has become central to the way in which health services are provided. Technology-enabled services in healthcare are often described as eHealth, or more recently, Digital Health. Practitioners may require new knowledge, skills and competencies to make best use of eHealth, and while universities may be a logical place to provide such education and training, a study in 2012 found that the workforce was not being adequately educated to achieve competence to work with eHealth.

We revisited eHealth education and training in Australian universities with a focus on medical schools; we aimed to explore the progress of eHealth in the Australian medical curriculum. We conducted a national interview study and interpretative phenomenological analysis with participants from all nineteen medical schools in Australia; two themes emerged: (i) Consensus on the importance of eHealth to current and future clinical practice; (ii) There are other priorities, and no strong drivers for change. Systemic problems inhibit the inclusion of eHealth in medical education: the curriculum is described as “crowded” and with competing demands, and because accrediting bodies do not expect eHealth competence in medical graduates, there is no external pressure for its inclusion. Unless and until accrediting bodies recognise and expect competence in eHealth, it is unlikely that it will enter the curriculum; consequently, the future workforce will remain unprepared.

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What Users Like and Dislike About Mobile Apps for Diabetes: a Qualitative Analysis of 5964 Reviews on 57 Android Mobile Apps

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Aim
Diabetes is the leading target for mobile health app developers. Despite rapid advancement in mobile technology and vast proliferation of mobile apps, the uptake of mobile health apps remains low. To identify the potential reasons for low uptake of diabetes apps, we explored user reviews of the apps to investigate end-user experiences and understand what users benefited from mobile apps and where their concerns laid. The aim of our study was to determine the strengths and weaknesses of currently available Android mobile apps for diabetes from the users’ perspective in order to produce key design and feature considerations for future diabetes apps.

Method
We searched the Google Play store for diabetes-related applications and retrieved their metadata including all available reviews left by the users for each app. A total number of 5964 user reviews from 57 apps were downloaded and exported to NVivo™ software. We conducted a qualitative thematic analysis of the reviews using grounded theory methodology.

Results
Six main themes emerged through qualitative analysis of the users’ feedback for the diabetes-related Android apps: 1) User self-administered care management; 2) User data storage, sharing and privacy considerations; 3) App customisation, accessibility and user interface design; 4) Associated app costs; 5) Data augmentation; 6) Technical support and user feedback. Under each theme, several key design and feature considerations emerged that are fundamental to the success of future diabetes apps.

Conclusion
The results of this study revealed the most important features of diabetes-related mobile apps from the users’ perspective. While a number of these features are specific to diabetes management, several features can be equally regarded as important in other chronic diseases. This will inform app developers on how to create and improve their apps and lead to higher uptake of mobile health apps.

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Setting Up Telepsychiatry Service for Rural Emergency Departments Across Three Local Health Districts – Challenges Faced and Lessons Learnt

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Mental Health (MH) resources in rural and remote Australia are stretched over regional towns separated by vast distances. Many patients present to the local Emergency Departments (EDs) with mental health issues. They endure extended waiting times and some are transported to the nearest MH facility often hundreds of km away. This results in sub-optimal care and puts pressure on limited ED resources.

In 2016, the NSW Ministry of Health funded the Northern Mental Health Emergency Care – Rural Access Program (NMHEC-RAP) to support rural and remote EDs of northern NSW. This is an innovative telepsychiatry project based at Newcastle spanning three Local Health Districts - Hunter New England, Mid North Coast and Northern NSW. It is based on a hub and spoke model where trained MH clinicians provide 24x7 specialist consultations utilizing telehealth and Electronic Medical Records (EMRs).

After initial rollout to four trial sites, the project is on scheduled roll out to other sites. Our experience was that in spite of initial hesitation, most EDs quickly embraced the model. The feedback received was quite positive with reports of reduction in patient waiting times and improved patient flow. There was high acceptance of telepsychiatry assessment by patients, ED nurses and local community mental health teams. Many lessons were learnt. Some were foreseeable challenges with technology adoption and change management. Not all sites engaged proactively. Clinical governance and medical credentialing were addressed. Despite the overarching policies of NSW Health, there was significant variation in clinical practices and systems at individual sites necessitating development of separate clinical pathways. Providing consistent medical cover to NMHEC-RAP required development of separate on-call arrangements for sites. There was boundary diffusion – EDs served by the project started attracting patients from outside their catchment area adding to unplanned clinical activity.

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TeleDot; Tele Direct Observation Therapy

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Vivid Solutions TeleDOT Solution was designed in conjunction with Auckland District Health Board (ADHB) in 2014 to aid in the treatment of tuberculosis (TB) patients in the Auckland area. TB patients require direct observation therapy (DOT) which requires a nurse to physically observe them taking medication for a prescribed period. Previously nurses were travelling which could take up to 6 hours per day. ADHB approached Vivid Solutions to utilise their national telehealth service to negate travel. The pilot was conducted using video phones with a dedicated network link. ADHB had a videoconference unit installed at the hospital that connected the nurse to the patient taking medication. The pilot worked well, however, it required considerable lead in time for the network provider to install a dedicated network link.

With some persuasion, patients started using a secure VSL software client on their own devices which allowed them the same connectivity but via any device or connectivity method. With the patient enabled to connect when they want, how they want, the barrier became both parties coordinating a mutually suitable time to have a video consult. We overcame this by setting up a secure dial in virtual meeting room that recorded on connection. The patient connects and then takes their medications (approx. 1-minute recording) at a time that suits them or is in line with their clinical management plan. The clinician then logs onto the telehealth portal and views the recording of the patient when they are free to do so. If there is any need for a follow up the nurse can contact the patient and set up a time to connect. This is the current state of the TeleDOT solution. It has taken what was originally up to a three hour round trip to a one-two minute clinical activity.

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When Might Video Lessen the Burden of Cancer Treatment on Both Patient and Hospital?

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Following a new cancer diagnosis, life can be overtaken by investigations, appointments and treatment. In March 2017 my mum was diagnosed with cancer, and so commenced a year of ten investigative procedures, two surgeries, one emergency admission, 31 medical, 23 nurse and four physiotherapy consultations, 16 chemotherapy and 25 radiation treatments and seven calls to the hospital. This intensity and frequency of treatment can be utterly overwhelming as people become patients, and the rest of life goes on hold. Many consultations might have been delivered by video, and for pre-chemotherapy review appointments in particular, could benefit both patient and hospital.

Pre-chemotherapy reviews are best completed several days beforehand to ensure patient clinical readiness for treatment; also enabling pharmacy time to prepare chemotherapy and more predictable Day Therapy scheduling. The negative impact of this on patients is additional travel when they are unwell and often immuno-compromised. To avoid this, same-day reviews are offered to regional patients, which is also problematic. For patients, the treatment day extends by many hours. If side-effects or signs of toxicity are not ameliorated, this may result in treatment delays - which can clinically and psychologically impact the patient especially when they have travelled for treatment that cannot proceed.

Same-day reviews also put significant burden on pharmacy, who must wait for the decision to treat before preparing the chemotherapy, then impacting on patient scheduling and staffing. While earlier reviews allow better preparation and patient management, a concern is that using video may detract from the consultation function. As such, several clinics were observed to note the core functions of the pre-chemotherapy review, the frequency of physical examination and to understand the potential impact of video. The aim was to determine where video may be more convenient, or detrimental, or actually a better option for pre-chemotherapy review appointments.

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Digital ECG: An ECG Reporting Service for Management of Chest Pain and Acute Coronary Syndromes in the Hume Region, Northeast Victoria

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In a Victorian first, Northeast Health Wangaratta and Alpine Health, in collaboration with the Victorian Cardiac Clinical Network, have developed a system of scalable workflows incorporating use of a digital ECG system (DECG) and video to enhance cardiac care in rural Urgent Care Centres (UCCs). DECG Reporting Service based at a regional emergency department (ED) supports management of patients presenting to rural UCCs with chest pain and suspected acute coronary syndromes (ACS). Generous community funding from the Bright Opportunity Shop, matched by the Victorian Government enabled introduction of this service. Workflows incorporate elements of the Hume Algorithm, for management of chest pain and suspected ACS, and the Hume Regional Emergency Department Telehealth Service, and fully align with Ambulance Victoria networks to transport patients to the right level of cardiac care, as early as possible.

Aims
Using DECG, improve the quality, timing and therefore safety, of ECG reporting services provided by regional EDs and on-call physicians, whilst enhancing support of rural clinicians in management of patients presenting to UCCs with chest pain and suspected ACS.

Methods
The DECG Reporting Service, with option for video consultation, commenced in May 2018. User and developer feedback of the system will be sought throughout implementation. A longitudinal, mixed methods, qualitative evaluation will be undertaken in collaboration with the University of Melbourne focusing on user and support staff experience.

Results
Early user feedback of DECG has been very positive, identifying better quality ECG images and clinical support to rural clinicians as major advantages of using the system. Importantly, evaluation of ICT staff experience in implementation of this system will be valuable for possible future expansion of this process across rural Victoria and other digital and telehealth services.

Conclusion
Rural clinicians recognise the benefits of using DECG to deliver better cardiac care to people presenting to UCCs.

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Building a Connected and Supported Community of Telehealth Stakeholders

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With the continual growth of telehealth activity across Australia there are significant opportunities to collaborate and learn from each other about implementing and evaluating telehealth. Communities of practice can be defined as groups of people who share a concern or passion for something they do and learn how to do it better through regular interaction. The Telehealth Victoria Community of Practice (COP) is one successful model that connects a range of telehealth stakeholders across the State. The COP features a central website with an interactive functionality where members share events, news, questions, answers and resources. There are 120 signed-up members to the website, with 82 discussion topics, and over 100 resources shared by members or created via COP activities, including development of position papers for government. The Victorian DHHS supports some funded time, enabling the coordination of in-person workshops, regular webinars and other special interest group meetings.

The COP has enabled professional relationships, partnerships and knowledge sharing that may not have otherwise occurred. Evaluation of the first year of activity demonstrated the members valued the role of the COP in enabling connections, providing opportunities for collaboration and developing new insights and perspectives on telehealth. Members also indicated that they made use of the information and resources on the website and found the weekly newsletters enabled them to keep up to date with telehealth news and events. They also indicated that this helped them to feel less professionally isolated, increased their confidence and contributed to positive improvements in their telehealth processes and service delivery.

In a field such as telehealth where technologies are rapidly evolving, and where profound changes to service delivery models are possible, the COP has reduced the implementation pain for individuals and health services that might otherwise have been repeating the same mistakes and lessons in frustrated isolation.

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An Innovative Telehealth Public-Private Partnership Transforming Specialist Outpatient Wait List Demand Management in Mackay Hospital and Health Service

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This paper reports on a unique public-private partnership managing specialist outpatient waitlists using telehealth clinics. Based at a major regional Queensland hospital, using a national provider of medical specialist telehealth services, the program has several innovative features. Public hospital and health services struggle to keep pace with the volume of referrals for specialist outpatient services. The disparity between demand and service capacity creates long waiting lists that are undesirable by any measure - clinical, social, and political. In 2015, Mackay Hospital and Health Service partnered with Telstra Health to trial telehealth with private specialists for 49 patients in Neurology and Rheumatology sub-specialties. The successful trial has evolved into a service which has treated over 750 patients across six sub-specialties and provided almost 2000 new/review outpatient appointments.

The features contributing to innovation and success will be discussed:
• Clear and robust referral mechanisms
• Rigorous categorisation
• Active clinic management
• Case management and active case review (clinical and administrative)
• Co-management of practice environment
• Clear patient and general practitioner communication practices;

New/Review ratios compare favourably, not only to recommended specialty ratios but to current in-person services (Endocrinology 0.23, Haematology 0.39, Hepatology 0.91, Neurology 0.76, Respiratory 1.0, Rheumatology 1.75). Fail to Attend rates in contrast to in-person attendance rates also compare well (Endocrinology 2%, Haematology 3%, Hepatology 6%, Neurology 11%, Respiratory 3%, Rheumatology 2%).

In summary, the innovative features that contributed to the success of this program and the learning points presented will allow participants to understand:
• Inbuilt flexibility design of the service to ramp up or down in quick response.
• The active and rigorous management and surveillance of all key aspects of the program.
• The interactive and collaborative management approach.
• The exceptional opportunity this integrated, whole of health system methodology offers health services to manage capacity/demand.

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A Review of a Regional Respiratory Unit Use of Telehealth in a Metropolitan Thoracic Oncology Multidisciplinary Team Meeting in Improving Patient Co-ordination and Treatment

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Aim
Cancer care is complex requiring a range of services and specialities including surgery, medical oncology, radiation oncology, nursing and allied health care. The complexity increases with rural and regional patients due to distance and the lack of medical resources in regional medical centres. The Fiona Stanley Hospital Thoracic Oncology Multidisciplinary team (MDT) meeting collaborates with Bunbury Regional Hospital to help coordinate the care of lung cancer patients in the country. This audit reviews time taken from MDT meeting to time to treatment or review and the recommendations from the MDT.

Method
Patient data was extracted from the SHaRE (Secure Health Record Exchange) database of all thoracic oncology patients from the Southwest Region from December 2016 – December 2017. Data collected from each patient included the date of MDT discussion, date to next treatment or review and the recommendation from the MDT meeting.

Results
There were 65 patients from the Southwest Region discussed at the MDT meetings during the audit period. 12 patients did not require involvement of Bunbury Regional Hospital. The median time from MDT discussion to next specialist review or treatment was 12 days (range 0 – 29 days).

- Three patients required a biopsy, one required bronchial stenting and four required surgery at Fiona Stanley Hospital.
- Ten required palliative chemotherapy, 11 required definitive chemotherapy/radiotherapy, six required palliative radiotherapy and three required palliative care at Bunbury Regional Hospital.
- Two required referral to a non-thoracic service and surveillance was recommended for 11 patients. Two patients required further discussion with the patient.

Conclusion
The use of telehealth to allow a regional cancer centre to discuss a thoracic cancer patient in a main tertiary multidisciplinary team meeting allows expert specialist input and reduces delays to treatment.

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How Telehealth Facilitates the Provision of Culturally Appropriate Healthcare for Indigenous Australians

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Aim
To explore how telehealth facilitates or impedes the provision of culturally appropriate healthcare to Indigenous Australians from the perspective of staff at an Aboriginal Community Controlled Health Service (ACCHS).

Methods
An exploratory qualitative study was performed. Semi-structured interviews were conducted with nine staff of a single ACCHS in a remote town in western Queensland, Australia. Interview transcripts were analysed using thematic analysis.

Results
One central theme and three sub-themes were identified. The central theme of “Care provided in a supportive environment” describes how telehealth enabled specialist consultations to be conducted in the safe environment of an ACCHS instead of a mainstream health service. The first sub-theme described how telehealth offered improved affordability and convenience and reduced the burden and stress of travel to access healthcare. The second sub-theme described how telehealth accommodated the presence of an Indigenous Health Worker to facilitate culturally appropriate healthcare, allowing them to advocate for community members’ needs, empower them to make decisions about their care, and clarify information or concerns. The third sub-theme described how telehealth supported an inclusive and holistic view of health in the community.

Conclusion
Our findings show culturally appropriate healthcare may be enhanced by the use of telehealth, which was valued because it allows care to be provided in the supportive environment of an ACCHS. It allows the community members to have the advocacy and assistance of an Indigenous Health Worker and reduces the burden of travel and dislocation from community and family.

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The Good the Bad and the Ugly of Whole of Health Board Introduction of a Telehealth Application

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Waikato District Health Board (DHB) is the largest rural Health Board in New Zealand supplying care to 440,000 people with 60% of our patients living in the rural environment and a Maori population of 22%. Waikato DHB provides tertiary services to 4 other Health Boards. In 2016 we adapted an American telehealth application which provides a communication channel and information holding between patients and clinicians. This presentation will cover the challenges and successes of implementation and a glimpse at the future.

HealthTap provided the DHBs application and we have worked in partnership to develop a useable application suitable to the NZ environment. This has meant finding safe ways to store information, protect privacy and enable patients to have as painless a sign-up process as possible. It has meant re-working how we operate our outpatient clinics and engage with our patients and the community as well as engaging our clinicians to work differently.

We enrolled over 6000 patients in the application resulting in 150 consultations a month. This includes consultations in a virtual after-hours service for urgent health needs. During the 2-year proof of concept we experienced a number of difficulties, both technical and project based, this presentation will give a "warts and all" overview of our experience and what we will be doing differently in the future.

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A Pilot Study on Tele-Physiotherapy Home-based Program for Geriatric Hip Fractures

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Prominent physical disability restrains many geriatric hip fracture survivors from returning to community. Post-discharge rehabilitation to counteract the situation is inadequate due to access barriers including mobility impairment and lack of appropriate transportation. This study intends to examine the feasibility and effectiveness of the use of tele-physiotherapy, which employs telecommunication technologies to bridge the access barriers and thereby facilitate patients' rehabilitation at home.

Methods
The study employed quasi-experimental pre/post design. Geriatric hip fractures patients who fulfilled preset physical and social criteria were invited to join a 4-week home-based program before discharge. There were four levels of circuit training comprised of exercises focused on strength, coordination and functional mobility. Subjects were asked to perform the exercise daily under the guidance of video, prescribed via internet links accessible by devices at home. Weekly teleconference sessions using commercially available applications (e.g. Skype) were provided to allow adjustments on exercise programs based on guided evaluation by therapists. Progression of exercise programs in terms of increasing repetitions and/or difficulty depends on the therapists’ evaluation on patients’ exercise performance and compliance.

Results
This is an ongoing research with 12 completed subjects since November 2017. Preliminary findings showed high acceptance and satisfaction among therapists, patients and carers based on feedback collected in the form of questionnaires and interviews. Significant functional improvement was also observed when comparing the difference in pre/post measures including Lower Extremity Functional Scale (LEFS) and Time Up and Go (TUG) test. Barriers such as equipment availability, discharge destination and staff competencies were identified.

Conclusions
Tele-physiotherapy is feasible for improving the access to rehabilitation with good compliance and acceptance by the selected patient group. Provision of technological support with clear instructions and adequate training to both therapists and patients would further facilitate service provision.

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“Build it and They Will Come”: Design, Architecture and Application of a Telehealth Data Dashboard in a Metropolitan Tertiary Hospital

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Building and sustaining a new telehealth service is challenging. The literature reports that while video consultations are acceptable, safe and effective for the delivery of services, eHealth innovations such as telehealth are characterised by a failure to evolve from project to business as usual. Programs frequently fail to reach the scale forecasted in planning; consequently, eHealth services have not yet triggered a revolution in care. Furthermore, Greenhalgh et al. describe that the analysis of telehealth studies and activities are often not readily available to those that deliver and plan these services; that is the clinicians, managers and executives. These outputs can describe and inform the upstream and downstream value proposition of these innovative models of care. These propositions, combined with the ability of a service to be able to acquire and synthesise knowledge, are key organisational characteristics noted in previously successful implementation of eHealth interventions.

This paper will describe the design, architecture and application of a visual data dashboard to report and inform the activity of a new telehealth service within a high volume metropolitan tertiary hospital. Royal Melbourne Hospital (RMH) manages in excess of 100,000 inpatient separations per year and 175,000 outpatient bookings with specialty catchments frequently crossing multiple state borders. Knowledge, skills and cohesive collaboration between the RMH telehealth team, informatician, database architect and dashboard designer enabled this information interface to be deployed. Key eHealth success factors of value proposition and organisational knowledge were motivators for the creation of this dashboard that enables clinicians, managers and executives to acquire, analyse and interrogate telehealth activity data, visually and at point of care.

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University Students' Perspectives on Mindfulness and mHealth: A Qualitative Exploratory Study

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Mindfulness can help college students with key challenges they face relating to weight gain and stress-induced emotional eating and binge eating. Little is presently known about the extent to which students are aware of mindfulness, their conceptualization and understanding of it, and the barriers as well as the facilitators of mindfulness on campus which is useful information for future health education and promotions campaigns. Additionally, promoting mindfulness through mHealth is a novel and accessible intervention medium. While there have been qualitative studies on mHealth for weight loss, there has not been a study on mHealth for weight loss using mindfulness that has explored student perspectives on mHealth for promoting mindfulness.

Method
A qualitative exploratory pilot study with a participatory design was undertaken at the St Lucia campus at The University of Queensland in March 2017. Data were analysed using NVivo ™ software.

Results
The key barriers to a mindful lifestyle on campus were identified as being social, cultural, knowledge, and time-management related. The food environment also promoted a fast food mentality over slow mindful eating. The sample text messages were positively received by students. Students preferred messages with practical tips about how to be mindful and how to integrate mindful reflection of both one’s body and environment while on campus. Students preferred a theoretical future student-centred mindfulness app that had the following design features: a simple design interface, a focus on education/practical tips, and real-life practical exercises.

Discussion
It is important to consider maximizing the potential facilitators of use and minimize potential identified barriers when developing and designing a future mHealth mindfulness intervention.

Conclusion
Future mHealth studies may consider integrating mindfulness-based text messages in their interventions for weight and stress as this is a novel feature that appears to be acceptable for students.

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Selfie Telemedicine: A Literature Review

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Patients are finding innovative uses for their mobile phones, the Web, or email, to share health related information (telemedicine). Reviews of WhatsApp instant messaging, mDermatology, and direct to consumer telemedicine have reported cases of patients taking ‘selfies’ and sending them to doctors for advice and treatment. ‘Selfies’, photographs taken of oneself by oneself typically using smartphones and shared using social media, have become integral to everyday life, including healthcare.

Aim
This study reviews the use of selfies in medicine.

Methods
Five literature databases were searched ("selfie" linked with the Boolean operator AND to medicine, telemedicine, telehealth, eHealth, e-Health, mHealth, m-Health), and supplemented by snowballing and hand searching. For Google Scholar, the search term "direct to consumer telemedicine" linked to selfie was also used, and the first two hundred hits for each search combination reviewed. Inclusion criteria: described the use or potential use of selfies in clinical practice.

Results
A total 3,611 references to selfies were found; 771 met the inclusion criteria, and after removal of duplicates 68 papers were reviewed. Most papers were dermatology related, followed by postoperative wound monitoring following day surgery, burn wound follow-up, and other limited uses. Several reported techniques for taking selfies. Image quality was generally satisfactory and reported concordance acceptable. Selfies for clinical use were broadly classified into unsolicited patient initiated photographs or clinician directed photographs. The usual legal and ethical concerns of data security, storage, confidentiality, privacy, licensure, remuneration, and authentication were raised with little mention of record keeping. Unsolicited patient selfies present a novel situation where the patient takes ownership and the responsibility for many of these issues.

Conclusions
The use of selfies is growing, but the benefits and disadvantages of selfie telemedicine need further investigation so that guidelines can be developed for both patients and practitioners.

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Managerial Implementation Lessons from Telegeriatric Consultations in a Residential Aged Care Setting Utilising the InterRAI Long-Term Care Facilities Assessment

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Aim
Identify executive level barriers to implementation of telegeriatric consultations in residential aged care (gleaned from facility level randomised controlled trial (RCT)).

Method
Ten residential aged care facilities (RACFs) were randomised in a pragmatic cluster RCT. Intervention group facilities had a geriatrician clinic via videoconference (VC) operating weekly as part of usual care; residents were referred for assessment. Facility-registered nurses (RNs) prepared the case using a standardised clinical assessment (interRAI Long-Term Care Facilities Assessment) which was entered into a web-based server, for the geriatrician to access during the VC consultation. The control group had usual care (facility-specific existing protocols for specialist consultation).

Results
A total of 413 residents (298 female; 72%) participated in the RCT: 161 residents received at least one video consultation in the intervention arm (telehealth; TH); and 252 residents received usual care in the control groups (CTL). An admission cognitive assessment identified 39% had mild cognitive impairment (TH: 17%; CTL: 22%), and 51% had moderate to severe impairment (TH: 16%, CTL: 35%). Challenges to service implementation were encountered which have relevance to telehealth implementation in RACFs: Initiating a new service; Modifying facility protocol; and stakeholder engagement. Organisations who budget for the ‘real’ cost of implementing a new initiative and approach the change with a long-term outcome in mind (i.e. improve care not just a research project) are more inclined to be ‘change ready’ and ‘change tolerant’. Facilities which do not modify existing organisational protocols to facilitate new work flows, and minimising documentation duplication and burden, are creating unsustainable pressure on staff. Not successfully engaging all participatory stakeholders (GP, family, RACF staff, resident) will minimise the effectiveness of specialist interaction.

Conclusion
Telegeriatric consultations are feasible if an organisation allocates time and resources to an implementation plan for transition to telehealth.

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eyeConnect - Introducing Asynchronous Telehealth in the Emergency Department

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The Royal Victorian Eye and Ear Hospital (Eye and Ear) is Australia's only specialist eye, ear, nose and throat hospital, and is the largest public provider of ophthalmology and ENT services in Victoria. Eye and Ear treats around 200,000 patients per year of whom 40,000 are managed in the Emergency Department (ED). Patients may be required to travel significant distances for emergency eye care. Eye and Ear has worked with Ingeneus Pty Ltd to develop eyeConnect, an asynchronous telemedicine device. Based on a slit lamp, it is designed for use by non-ophthalmically trained clinicians to support rural and regional hospitals with limited ophthalmology access and minimise the unnecessary transfer of patients from their community.

Patients are examined using the device and a package of patient history, test results and photos is sent securely to Eye and Ear’s ED for clinician review. The clinician then telephones the referring hospital to discuss whether the patient can be managed locally or requires transfer to Eye and Ear for specialist care. The first eyeConnect unit was installed in an outer metropolitan hospital ED in June 2016 and a further 14 devices have since been distributed to rural and regional EDs and urgent care centres. To date, 207 packages have been received with a consolidated ‘manage locally’ rate of 63%. This represents a saving of almost 34,000 kilometres or 430 hours of travel at a cost of more than $22,000.00.

As the distance to Eye and Ear increases, the ‘manage locally’ rate increases to 78% reflecting the diminishing availability of ophthalmology advice in the regional and rural setting. The use of eyeConnect formalises the traditional phone call to the ED, supports inexperienced clinicians, reduces response times and can save patients from unnecessary travel while facilitating effective care and improving their care experience.

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The eMental Health in Practice (eMHPrac) program provides digital mental health training for health practitioners including General Practitioners, Allied Health Professionals, and other service providers working with Aboriginal and Torres Strait Islander people. This presentation will explore the training approaches used to increase service providers’ confidence and awareness of digital mental health resources and support implementation into usual practice.

The program partners (Queensland University of Technology, Blackdog, Menzies School of Health Research and University Centre for Rural Health) have each developed training packages specific to their contexts and audiences with local expert reference groups guiding their work and supporting cultural accountability and knowledge transition within the sector. The regionally modified training packages are designed to build knowledge and understanding of evidence-based digital mental health tools. Trainees are introduced to a host of electronic resources including self-driven or practitioner guided online programs, some providing simple health and wellness information and others offering more intensive treatment programs that connect patients with a real-time clinicians and online treatment programs.

Based on the lessons learnt over 4 years delivering the program, Menzies have developed an Extended Implementation Support Program to assist organisations to use digital mental health tools, with a specific focus on the AIMhi Stay Strong App. The intensive implementation package consists of:

1. Executive implementation meetings designed to support organisational change management
2. 1-day training workshop,
3. 1-day train the trainer package, and
4. Extensive follow up support for the use of the Menzies AIMhi Stay Strong App.

In 2017 Menzies expanded the Extended Implementation Support Program to include interstate organisations. Uptake has been optimistic with expressions of interest registered in SA, QLD and WA.

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Mobile Diabetes Management System for Insulin Dose Adjustment in Type 2 Diabetes for Specialist Outreach and Diabetes Telehealth Service (REMODEL-IDA): A Pilot Randomised Controlled Trial

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Background
Type 2 diabetes (T2DM) is a progressive disease that involves step-wise addition of multiple glucose lowering agents over time to achieve adequate individual glycaemic targets, with insulin being the most potent among them. Insulin initiation and/or titration for type 2 diabetes (T2DM) is a resource intensive process through an insulin dose adjustment (IDA) service led by a credentialed diabetes educator (CDE). There are limited resources in a regional and primary care setting.

Hypothesis and Aim
We hypothesize that eHealth offers an opportunity to transform the current model of IDA service delivery. The new model aims to improve glycaemic management, healthcare service delivery efficiency and the patients’ experience.

Method
We have developed a Mobile Diabetes Management System (MDMS) which has a patient front-end capability that enables patients to upload and view monitoring data and provides auto-generated text advice around their glycaemic management. It features a clinician portal to monitor and manage patients’ care. A two-arm pilot randomised controlled trial (RCT) will be conducted for 3 months with 44 type 2 diabetes participants, randomised at a 1:1 ratio to receive either the MDMS model of care (intervention) or routine care (control), in diabetes specialist outreach and telehealth clinics. These clinics serve disadvantaged and regional communities. The routine care arm will be followed up via telephone calls. The primary outcome is change in HbA1c, a marker of glycaemic management, at three months. Patient and healthcare provider satisfaction, and time required by health care providers in both arms will be collected.

Conclusion
This pilot study will inform retention, acceptability and glycaemic outcomes from people with T2DM, and clinicians to guide the conduct of a large pragmatic RCT across regional and remote Queensland, Australia. This has the potential to be integrated into routine diabetes care and build capacity for regional Australia.

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Royal Flying Doctor Service (RFDS): Telehealth Connectivity Mapping Project

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The introduction of telehealth as a service delivery mode has greatly improved the ability for patients in remote and rural areas to access healthcare services. RFDS facilitates and delivers patient consultations with specialists and primary healthcare clinicians via telehealth, including via videoconference and teleconference. However, there are several barriers to introducing telehealth services into remote and rural communities, such as those serviced by RFDS. Telehealth services in these areas are often hindered by poor internet connectivity and poor information technology (IT) support or knowledge. These barriers may be perceived as being insurmountable and may prevent a vital telehealth service from being implemented.

RFDS theorised that, with the right support, it may be possible to overcome many of the barriers to delivering telehealth in remote and rural areas. RFDS is therefore undertaking a telehealth connectivity mapping project to investigate both the common and unique connectivity issues experienced in these areas, and provide guidance on troubleshooting, with the aim of improving connectivity to support telehealth services. It will also consider the different internet connections available in remote and rural Australia.

The outcome of the project will include a connectivity map and manual to help guide connectivity troubleshooting and support health service staff at all levels within RFDS to provide telehealth services, regardless of their experience and knowledge of IT. Through the adoption of a Plan, Do, Study, Act (PDSA) methodology, the project will also be able to adapt the tool to incorporate new barriers that are identified, as well as improve the usability of the tool. Utilising the RFDS network, the tool will be tested in a variety of rural, remote and very remote locations. Once tested, the tool will be available for use by other organisations wishing to deliver telehealth services in remote and rural areas. Interim results will be presented.

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Face to Face in Aged Care – A Telehealth Partnership Between Acute Care and Aged Care – First Time In NSW

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Residents in residential aged care facilities (RACFs) have a higher proportion of presentation to the emergency department (ED) and readmission to hospital. The consequences of transfer to hospital are significant, including increased risk of delirium, falls, medication errors, pressure injuries and deconditioning. When admitted to hospital, they have a long length of stay, and new admissions to RACFs have a high chance of readmission to hospital. Belmont Hospital is a level 3 hospital on Lake Macquarie which caters for one of the oldest patient populations in New South Wales.

Method
Partnering with six Anglican Care Aged Care facilities, Belmont Hospital proposed to incorporate telehealth into Aged Care Emergency (ACE) – which uses evidence-based algorithms to standardise care and a nurse-led call centre to support RACF staff. Telehealth would add a visual assessment to increase the clinicians’ ability for patient management and hospital avoidance. We used “reverse” telehealth where acute hospital inpatients connect with their RACF clinical team, facilitating discharge home as soon as possible.

Results
From May 2016 to October 2017 43 reverse telehealth calls were made (from acute care to RACFs) and 8 telehealth calls were made from RACF to the ED. There were no ED representations within 48 hours and no admissions to hospital within 28 days of the telehealth calls. No RACF telehealth patients died in the emergency department. ACE calls to ED fell by 30% from the participating RACFs.

Conclusion
Telehealth is a valuable visual tool for clinicians supporting the RACFs to get the right care in the right place at the right time for their elderly residents. RACF Registered Nurses value the visual input on their residents on discharge from hospital. The collaboration between acute care and aged care nursing staff increased.

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The Effectiveness of Telemedicine Applications on Maternal Depression: A Systematic Review and Meta-Analysis

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Maternal depression (MD) is an important public health issue due to its chronic and long-lasting impact on the mother, child and family. Negative impacts of MD include impaired cognitive processing and linguistic development, child neglect or abuse, and marital stress. This study aims to review current evidence relating to the use of telemedicine interventions targeting maternal depression.

Method
We reviewed four major databases, namely PubMed/MEDLINE, PsycINFO, EMBASE and the Cochrane Library for literature in this area between 2000 and 2018.

Results
A total of ten randomised controlled trials were included for analysis after considering the inclusion and exclusion criteria. Our review found that a range of telemedicine applications have been used for tracking, monitoring and treating maternal depression, with most evidence supporting improvements in perinatal depression. While a number of therapeutic methods have been used by telemedicine, the use of cognitive behavioural therapy and behavioural activation was most common among the trials. The majority of the trials (n=8/10) found significant improvement in depression scores post-intervention and 4 studies that conducted follow-up found that these improvements continued after the trial. Six studies also found a large effect size between the treatment and control groups. The included studies covered a wide variety of countries, providing evidence for the generalisability of the results. However, attrition rates and blinding were a common source of bias among the studies.

Conclusion
Therefore, telemedicine interventions have been shown to be successful in significantly reducing depression and anxiety in pregnant women and new mothers. It would be useful for further research to implement a large-scale intervention on women, ensuring blinding and utilising communication via mobile technology to prevent attrition. It is also important for interventions to follow women through pregnancy till one-year postpartum to ensure that the results continue.

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Telementoring for Hepatitis C Treatment in Correctional Facilities

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Aim
Prevalence of hepatitis C among prisoners in Australian correctional facilities is 40 times higher than among the general population. Yet, treatment upon entry to prison is rare. Furthermore, due to medication side effects, only prisoners with advanced liver disease or those at low risk of mental health side effects, typically receive treatment. Newly available Direct Anti-Viral Agents (DAA) now also allow treatment of mild to moderate cases. However, these can only be prescribed by General Practitioners and Nurse Practitioners who are experienced prescribers. The study evaluated a mentoring service delivered via videoconference to upskill clinicians in correctional facilities in Queensland in order to become experienced DAA prescribers.

Methods
The telementoring service was provided using a hub-and-spoke model by a hepatology specialist and nurse located at the Princess Alexandra Hospital, Brisbane (hub), to six correctional facilities (spokes). Semi-structured qualitative interviews with involved health service staff were used to evaluate the feasibility, impact and effectiveness of the service. Qualitative data were analysed using content analysis.

Results
Of 19 clinical staff who were invited, 16 participated in the interviews (ten females; age range 32-60 years). These were from a variety of staff levels and positions, including medical, nursing, allied health and administrative. Key themes included barriers to the new model of care, such as coordination of treatment when prisoners moved between correctional facilities; effects on prisoners, such as improved access to treatment; successes of the telementoring model, such as the increased capacity to treat; and, higher workloads for involved prison staff.

Conclusion
Telementoring to upskill staff in order to become experienced prescribers of DAA is a feasible and effective method to increase capacity to treat hepatitis C in prisoners. However, more research is needed to examine how identified barriers, such as increased staff workload can be improved.

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A Nurse Led Telehealth Service Supported by a Gastroenterology Consultant Treating Hepatitis C in a Remote Community from a Metropolitan Hospital

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Treatment of chronic hepatitis C (CHC) patients outside of metropolitan centres is associated with significant challenges including limited access to local specialists or general practitioners able to treat CHC as well as lengthy travel, patient discomfort and poor attendance rates to larger hospital clinics. Telehealth could be an attractive alternative for remote communities by offering treatment in closer proximity, particularly for patients with limited transport options and from socioeconomically disadvantaged backgrounds.

Methods
Department of Health funding was successfully acquired to trial a telehealth treatment clinic with a nurse on site in a remote area location supported by a gastroenterology consultant based at a tertiary hospital 50km away. Patients meeting the following eligibility criteria were invited to participate: CHC, compensated or no cirrhosis and English speaking. Quantitative and qualitative data were collected including failure to attend (FTA) rates, time/distance/money saved per patient visit, clinical outcomes and patient satisfaction.

Results
During the 6-month pilot period, 33 patients were seen with an FTA rate of 16.7% (compared with 23.8% for a similar pre-trial period). This resulted in average savings per patient consultation of 37.15km, 51 minutes and $24.52. Medication adherence and successful cure rates following CHC treatment were similar to specialist tertiary clinics. Patients were highly satisfied with the telehealth experience with predominant initial issues being technical relating to audio quality.

Conclusion
This telehealth clinic to a remote location improved attendance and treatment access for a previously difficult to capture and socioeconomically disadvantaged cohort. Clinical outcomes were equivalent to other specialist clinics while demonstrating significant reduction in patient travel times, distances and costs. Ongoing support and expansion of this model could allow implementation to other sites, inclusion of other liver diseases and reduced pressure on other clinics, providing benefits to both patient and health service.

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Designing a Tablet Application for Older Users: Principles and Practice

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The proliferation of software applications in consumer online health settings raises questions of good practice in how to design and develop them to maximise acceptance, utility and benefits to users. Often applications are developed independently of users and then sent to trial, only to discover design flaws through assumptions about user characteristics. This is especially disadvantageous when the application is intended for a user group which has specific limitations or expectations which will be imposed on the technology, such as youth or disability.

This paper provides a case study of the design process undertaken in producing a tablet-based memory assistant solution which was intended for older users (>65yo) suffering early stage memory loss. We applied an overall approach consistent with “living laboratory” methodology. The associated principles are: co-creation; multi-stakeholder participation; active user involvement; real-life setting, and multi-method approach. We will describe the detailed steps and provide samples of the application design from each stage of its evolution.

In the design process we first identified functional elements of the solution aligned with business purpose through experts in the project consortium of partners (including aged care workers and professional carers) in response to an initial conceptual model for the application. We then used multi-stakeholder focus groups of personal and professional carers to guide co-creation. Using design principles for elements of accessibility and useability based on W3C guidelines we then produced a simple mock-up for live testing.

We extended this mock-up to establish a prototype implementation in successive co-design phases using alpha testing with internal stakeholders having application domain knowledge, followed by beta testing of the improved prototype with stakeholders drawn from the wider population of older persons, and project consortium partners. The refined prototype application will next be pilot tested with the target population (N=75).

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Murray Connect - Remote Patient Monitoring for RACF Residents with Chronic Disease

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Murray PHN is trialling a new remote patient monitoring model, with the overall aim of supporting primary care and reducing Potentially Avoidable Hospitalisations (PAH) from aged care facilities. In 2008-2009, almost 10% of the 1.1 million hospitalisations for older people nationally, were for people already living in residential aged care. Respiratory conditions were the most common reason (17%) for hospital admission of permanent aged care residents. There are also correlations between disadvantage and rurality for preventable hospitalisations, which are prominent issues in large parts of the Murray PHN region.

Interim findings will be presented of the trial which is being conducted across seven residential aged care facilities (RACF) sites, with five locations being in more remote parts of North West Victoria. Monitoring and alerts are managed for participants who have either diabetes, COPD or CHF (or a combination of) and live in one of the RACF trial sites. The point of difference with the Murray Connect model is that it optimises and is optimised by an existing geriatrician telehealth service from a large regional hospital. The system utilises Tunstall Healthcare’s, ‘Connected Health’ equipment and Integrated Care Platform, with key partners including Bendigo Health and Loddon Mallee Rural Health Alliance.

The model is being trialled until the end of 2018 and will determine the useability and effectiveness of Murray Connect as a tool for GPs and RACF staff in maintaining the health of their aged care patients. The 6-month trial follows and reports on the patient and workforce experience of the model, providing valuable insights for future design, with a view to expansion of the service to other RACFs within the Murray PHN catchment and to people with chronic disease who are ‘ageing in place’ in their own homes.

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Participant Engagement in a Telehealth Communication Skills Program for People with Brain Injury and their Carers

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Aim
To compare telehealth (TH) via Skype with in-person (IP) via home visit delivery of communication skills training for people with Traumatic Brain Injury (TBI) and carers on participant engagement variables.

Methods
Thirty-six people with TBI and their carers were recruited. Participants in Sydney (n=23) were randomised to TH or IP training using a 1:3 ratio. Participants outside Sydney (n=13) were allocated directly to TH training, resulting in 19 TH participants and 17 IP participants. Participants completed 10 training sessions based on the TBI Express communication training program. Content of training was identical across TH and IP delivery modes. The groups were compared on measures of participant engagement including (a) drop-out rate, (b) program completion time, (c) homework completion, and (d) therapeutic alliance as measured by the Agnew Relationship Measure post-training. Reported outcomes are a subset of the study measures.

Results
Participants had either a severe (n=35) or moderate (n=1) TBI. No statistically significant differences existed between groups in months post-injury (TH median=53, IP median=12, p=.56), post-traumatic amnesia duration (TH mean=68.0 days, IP mean=47.1 days, p=.25), age (TH mean=43.7 yrs, IP mean=50.4 yrs, p=.17) or gender distribution (TH M:F=17:2, IP M:F=13:4, p=.39). No significant group differences were observed for drop-out rate (TH: 3/19, IP: 2/17, p=.99), time to complete program (TH: median=16.7 weeks, IP: median=16.1 weeks, p=.83), or homework completion (p=.25). Therapeutic alliance was rated highly by both TH and IP groups (median ratings 5.7-7.0/7.0) with no significant group differences on any subscale (p=.29-.91).

Conclusion
Previous studies have found a sizeable proportion of people with TBI and carers prefer IP services over TH. However, the current study found no differences in participant engagement between these two modes and supports the feasibility of using TH via Skype for TBI rehabilitation.

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Implementation of Video Consultations in an Out-Patient Clinic: Challenges and Barriers

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In order to deal with demographic challenges and an increasing complexity of healthcare, a shift in the way health care services are provided, is required. In 2016, a study was initiated in a large out-patient clinic for patients with diabetes, thyroid disorders and osteoporosis. Consultations were performed by use of a video platform, to which the patients had access after downloading an app on their own device.

Aim
To investigate barriers in relation to the implementation of video consultations in clinical practice.

Methods
Field studies were carried out including informal interviews and diary records. Formal individual interviews and a focus group interview were conducted as well.

Results
Although both patients and health professionals were positive towards video consultations, the implementation was not without problems. A number of potential obstacles were found, e.g. inertness to provide health care in a different way, and changes in workflow including shift of tasks from doctors to nurses. Ambiguity regarding the digital health solution, the quality of care, and the interpersonal relationship between the professional and the patient also proved to be barriers. Furthermore, poor internet connection and the applied digital solution posed a challenge; as patients used their own device some were challenged by download of the app, login and setting of volume. In-hospital, technical challenges were primarily related to unsuitable equipment, and office rooms with background noise. In addition, involvement of many health professionals resulted in a low number of consultations with little confidence in the use of the technique.

Conclusion
Implementation of a digital health care service in a large organization is challenged by culture and organizational issues. Both patients and health professionals experienced technical difficulties. A successful implementation must include strategies for involvement of patients and health professionals, as well as organizational and technical issues.

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Tele-Audiology: Using Telehealth to Improve Access to Audiology Services in Far North Queensland

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An unmet need for onsite audiology services to support ENT specialists in the Cairns and Hinterland Hospital and Health Service (CHHHS) drove the development, implementation and evaluation of a student-assisted tele-audiology service. Prior to the implementation of the service, audiology services of CHHHS were outsourced to a private provider due to the absence of Queensland Health audiology services in this health service. The aim of this study was therefore to investigate the feasibility and satisfaction of this new model of care for patients and key stakeholders.

Patients were offered appointments at Cairns Hospital for audiology assessments conducted via telehealth to occur on the same day as their face-to-face ENT appointment. Tele-audiology assessments were conducted by students and clinical educators from The University of Queensland’s (UQ) St Lucia campus, and were supported by a hospital-based allied health assistant.

The research project evaluated outcomes for and experiences of patients, staff, students and specialists. Findings indicate that the majority of patients (97%) received a tele-audiology assessment on the same day as their ENT appointment. The assessment was successfully completed in 92% of cases, with results reported immediately for the specialist. In terms of satisfaction results, 99% of patient participants reported positive satisfaction with the service. 100% of ENT specialists surveyed were satisfied with the tele-audiology service. Further findings suggest that students enjoyed their clinical placement experience and significantly improved both their knowledge (2.15 to 3.45/5) and level of confidence (2.30 to 3.40/5) in delivering tele-audiology services. Clinical educators were satisfied with the level of service that the tele-audiology clinic provided (3.96/5).

Results of this study showed that the tele-audiology service was both a feasible and acceptable model for all stakeholders for improving access to audiology services for patients of the CHHHS.

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Perceptions of Prison Inmates and Officials of the Correctional and Health Departments of Sri Lanka on Telehealth

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Sri Lankan prisons are faced with challenges in providing appropriate and timely care for prisoners. On average, 19,108 prisoners occupy the prisons in Sri Lanka per day.

**Aim**
To understand the perceptions of prison inmates and officials of the correctional and health departments on the use of telehealth as an alternative method to optimize services.

**Methods**
A multi-centre descriptive qualitative study was conducted in three correctional facilities in Sri Lanka. Three focus group discussions (FGDs) with inmates and in-depth interviews with correctional and health department staff members were conducted. Participants were selected using convenient sampling. Interviews and discussions were audio-recorded and transcribed for content analysis.

**Results**
Eleven occupational categories in prison and health departments were interviewed; 48% (n=12) from the Department of Health and the rest (52%; n=13) represented Department of Prisons. Each FGD consisted of 10 prisoners and all thirty were males. Staff included superintendents of the prisons (n=3), chief jailors (n=2), rehabilitation officers (n=2), medical doctors (n=3), nursing officers (n=3) and other staff categories (n=12) of prison-health services. Analysis of content identified three themes. First was poor access to quality health services (unclean health units, low doctor-patient ratios, poor prescription services, medication errors). Second theme was related to telehealth. Participants viewed telehealth as an option for increased access to higher quality health services with reduced patient transfers and minimal security concerns. Third was identified enablers and barriers. Enablers were: positive attitudes of prison medical staff, senior prison officers, and specialists towards telehealth. Barriers identified were the weak legal framework, issues related to privacy and confidentiality and poor attitudes of non-clinical prison staff.

**Conclusions**
Perceptions of officials (health and prison) in Sri Lanka on using telehealth seem to be positive. However, prior to implementation, long-term sustainability of the system (cost, personnel availability) need to be assessed accurately.

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A Study on Telehealth Pharmacist-Led Residential Medication Management Reviews

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Aim
To test an existing telehealth platform to deliver pharmacist-led medication review strategies to persons living in residential aged care facilities (RACFs).

Methods
Five pharmacists were recruited to test the telehealth system. After training on how to navigate the system, they were asked to complete a medication review on 20 vignettes of RACF residents as they would in routine practice but with the use of the telehealth platform. For each case, in addition to writing a report of their recommendations, pharmacists recorded the time taken to complete the review and commented on the adequacy of provided clinical information. Pharmacists’ opinions on their experience with the telehealth modality were also sought. To explore the pharmacists’ usual practice, they were asked to complete a questionnaire on their five consecutive visits to five different RACFs, seeking information on time taken to complete the review including travel.

Results
One hundred online reviews were completed with the median time of 42 min (IQR 30-60 min). This was 13 min less than the median time pharmacists spent on the reviews they conducted during their visits to RACFs as part of their usual practice (55 min IQR 45-71 min). The pharmacists found the clinical information provided on the online platform adequate in more than half of the reviews (57%), while on 14% of occasions they thought it was inadequate. Of the five pharmacists, three found accessing clinical information in online reviews more difficult compared with their usual practice, while the other two found it neither difficult nor easy. Four out of five pharmacists thought they were prepared to use the online system as part of their routine practice.

Conclusion
Using the telehealth platform can improve the timeliness of the current residential medication review process and it has the potential of being used as a part of routine practice.

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Consumer Preferences for Skin Cancer Detection - Probability of Teledermoscopy Service Uptake and Willingness-to-Pay

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Aim
To determine consumer willingness-to-pay for teledermoscopy screening services and probability of service uptake.

Methods
113 participants in a randomised controlled trial comparing self-skin examination and mobile teledermoscopy completed a discrete choice experiment (DCE) question set about skin cancer screening services. The DCE question set comprised 24 questions, divided into two blocks. For each question, respondents were asked to make discrete choices between two opt-out choices and two skin cancer screening service options described by 7 attributes. A mixed logit model was used to estimate preferences for skin cancer screening services, marginal willingness-to-pay for a teledermoscopy service, and probability of service uptake. To estimate the marginal willingness-to-pay and service uptake it was assumed that only three service models were available before teledermoscopy was added; self-skin examination, visiting a GP, and visiting specialised GPs at a skin cancer clinic.

Results
Results were driven by the consumers’ preference for dermatologist involvement in their diagnosis, increased accuracy, and reduced excisions, all of which were statistically significant in driving choice between service models. Probability of uptake for the current services assuming realistic service attributes were estimated at 0.18, 0.45, and 0.37 for skin self-examination, visiting a GP, or visiting a skin cancer clinic respectively. If consumer-driven teledermoscopy became available the uptake probabilities were estimated to change to 0.02, 0.06, 0.05 respectively with 0.87 probability of uptake for teledermoscopy. Consumers would be willing to pay AU$115 to move from the current three service models to a situation where a teledermoscopy was available.

Conclusion
Skin cancer screening services which are delivered by health professionals (rather than self-examination), especially dermatologists, are preferred by consumers. The probabilities of teledermoscopy service uptake were high and consumers were willing to pay for their preferred skin cancer screening method, especially if a dermatologist was involved.

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The New Paradigm in Telehealth – Keeping Information Technology Videoconferencing Systems Simple

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Many video conferencing and scheduling systems used for telehealth are complex, require intensive maintenance and support and high levels of skills for users. In Aboriginal communities in East Arnhem Land, telehealth has improved health service delivery for very remote Aboriginal people by providing improved and speedier diagnoses, increasing access to specialists and a wider range of health service providers, reducing the need to travel to major centres to access services, providing on-going professional development for remote clinical staff, providing better supervision for GP registrars and facilitating culturally sensitive group decision making.

At the commencement of the work the communities did not have access to internet. Galat satellite systems were deployed to provide uncontended access to internet. These systems were supplemented by broadband internet provided by NBN. Cisco videoconferencing Codec Systems were deployed in the three very remote community health centres and training and support provided for 12 months. During this time, a number of technical issues arose requiring high level technical support on a frequent basis. Faults included connectivity routing, failure of remote control devices, hardware failure due to high environmental temperatures and network management and configuration.

Failures in the video conferencing technology and software resulted in staff using smart phone video conferencing solutions. These were found to be robust and reliable and provided adequate optics for diagnostic purposes. These very remote clinics are often not manned by skilled clinicians as the nursing and GP staff are located remotely and often the Aboriginal Health Professionals in the communities are on escort services with patients away from community.

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Agreement Between Telehealth and Face to Face Assessment of Intellectual Ability in Children with Specific Learning Disorder

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Aim
Access to cognitive assessments for children living remotely is limited but telehealth assessment represents a potential cost and time effective solution. A pilot study was conducted to determine the feasibility and reliability of telehealth to assess cognitive function in children with learning difficulties using consumer grade equipment.

Method
Thirty-three children (median age = 9 years 11 months) underwent assessment of intellectual ability using a standardised and commonly used assessment tool. Comparisons were made between the intellectual ability index scores obtained by a clinician in the same physical location as the children and another clinician who delivered and the assessment via telehealth using a web-based platform.

Results
The telehealth administration method yielded comparable results to the face to face method. Correlation analyses showed high associations between the testing methodologies on the intellectual ability indices (correlation coefficient range= .981-.997). Bland-Altman plots indicated that, in general, the mean difference between face-to-face and videoconferencing modes was close to zero across all levels of ability, indicating sufficient agreement between the two conditions. In addition, there were no significant differences in the child’s behavioural presentation across assessment formats (telehealth vs. face to face).

Conclusion
Findings indicate that telehealth may be an alternative to face to face cognitive assessment. Future work in a broader range of cognitive tests and wider range of clinical populations is warranted with non-clinicians supporting the child in the same physical location.

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Expanding Flying Doctor Telehealth: Challenges of Telehealth in Rural Victoria

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The Royal Flying Doctor Service Victoria (RFDS) has delivered a successful endocrinology telehealth service in rural Victoria since 2013. Throughout 2017, RFDS received funding to expand the telehealth service to more locations and specialities including cardiology, psychiatry and respiratory (in addition to endocrinology). With the successes of the established endocrinology service, the presumption was that the service would easily and quickly be adopted by current sites, with some extra support needed for new sites. Appointments were opened for the new specialities from July/August 2017.

Utilisation of new specialties were not as busy as anticipated in the first few months. A challenge identified was GPs being reluctant to change their current referring habits to refer to the new specialties on offer. Another challenge was that while executives and management at health services were supportive of the service, there was an unwillingness and lack of support from coal face staff that facilitate appointments, therefore limiting the progress required for increasing telehealth utilisation. The low uptake of appointments lead to the development of a number of strategies to increase utilisation including: increased support of health service staff and development of action plans for each site; public promotion of the service to the communities via newspapers, radio and a direct mail drop; and direct mail and face to face engagement with GPs.

The promotion of the service to the public was determined as unsuccessful in increasing uptake of the telehealth service. It was thought that the public promotion of the telehealth service would make patients proactively ask their GP to access the service. However, it was found that as the main gatekeeper in the community, direct promotion to GPs was the most successful method of improving uptake of the telehealth service in new communities and increasing telehealth utilisation in existing communities.

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A Brief Online Classroom Behaviour Management Training for Teachers to Address Student Behavioural Issues in Rural India: A Pilot Study

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Referrals to paediatric outpatient clinics often involve concerns about behavioural problems at home and at school. Where schools are concerned, teachers often require on-going coaching in the management of students’ behaviours. When the distances between expert health advice and the school services are a concern, Tele-Education may be used to bridge this competency gap. India’s education policy has had considerable success in increasing students, from rural and disadvantaged areas, participating and completing secondary schooling. However, it has also resulted in higher numbers of students with challenging classroom behaviours. Behaviour management is not well addressed in the current national plan and little training is provided to teachers. Our previous research both defined the behavioural management issues as well as the skills requirements for teachers to manage and provide positive behavioural management (Teoh, Cheong, Eucharista, Edirippulige & Bambling, 2015).

Aim: A trial of a brief online training program was developed and evaluated.

Method: Three online lectures and real time behaviour management case discussions were provided to assist teachers (n=10) to manage challenging behaviours by male students (n=50) in a pre and post intervention single group design.

Results: The Tele-Educational intervention improved teacher application of behaviour management principles and improved classroom behaviour in young males.

Conclusion: There is potential for the approach to be utilised in other parts of India or in other countries where there is a need for telehealth training.

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Lymphoedema Telehealth Model of Care

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Introduction
Cancer is one of the most important health challenges, with the numbers of patients diagnosed each year predicted to reach over 41,000 in Victoria by 2025. Access to specialist services for cancer related lymphoedema within Victoria varies, limited by patients travelling substantial distances to receive care, recent public lymphoedema service closures and increasing numbers of patients diagnosed each year.

Presentation
As part of the new Victorian Comprehensive Cancer Centre (VCCC) telehealth network project, Peter MacCallum Cancer Centre (PMCC) has developed a new model of care for select lymphoedema patients. A lymphoedema trained project officer was appointed to develop educational materials, identify appropriate lymphedema patients, and upskill current therapists in using telehealth.

Outcomes
This new model has reduced the need for patients to travel long distances for expert opinion, reduced the burden of costs associated with this travel, provided clinical support for isolated rural clinicians caring for patients with lymphoedema, and increased our capacity to monitor stable patients remotely.

Clinical Implications
The Lymphoedema Telehealth Model of Care, once the technology is available, has resulted in positive patient and clinician feedback. Overcoming barriers such as clinician buy-in, administrative support, and embedding this model in usual care have been the most challenging aspects of the project’s implementation.

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Admitted Stroke Rehabilitation Closer to Home for People in Country WA

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The TeleStroke TeleRehab Project (“Project”) enables people in country WA to receive timely, high quality admitted stroke rehabilitation closer to home through dedicated links with a metro-based specialist stroke team using telehealth. Previously, WA Midwest residents had to travel sometimes over 1000km to Perth-based stroke rehabilitation units to receive specialist inpatient rehabilitation, as recommended within National Stroke Guidelines. This places financial, social and emotional pressure on patients and families, and can impact clinical outcomes and hospital length of stay.

The Project, which commenced April 2018, supports the delivery of admitted stroke specialist rehabilitation in Geraldton Hospital, 600km north of Perth, through linking with the specialist Stroke Team at Osborne Park Hospital, Perth, for specialist advice and education. This is facilitated through telehealth, including clinical team meetings, clinical intervention sessions, and clinical workforce education. Prior to Project commencement, approximately 15 Midwest residents received admitted stroke rehabilitation in metro hospitals, totaling ~1600 bed days.

In July 2018, initial formal evaluation will analyse predicted benefits including: 1) Increased regional self-sufficiency without compromising quality of care; 2) Improved quality of stroke rehabilitation care provided within Geraldton Hospital through Geraldton Hospital stroke workforce access to specialist consultation, stroke education, and targeted Geraldton Hospital stroke rehabilitation service delivery model improvements; and 3) Cost savings associated with increased regional self-sufficiency, and stroke rehabilitation service delivery model efficiencies.

Early feedback indicates increased Geraldton Hospital stroke workforce confidence and skill in providing evidence-based stroke rehabilitation, and positive feedback from patients and family in receiving care closer to home. Multiple telehealth options (VC enabled rooms and PCs) and training in equipment use have been identified as a priority enabling timely interaction between country and metro workforces. Further work is required to articulate a funding model supporting provision of metro specialist services to patients admitted in WA Country Health facilities.

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The Delivery of Allied Health Services Via Telehealth within Local Public Library Facilities

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St Giles (allied health and disability services provider) and LINC Tasmania (state public library and archive service) have partnered in a pilot project to deliver allied health services via telehealth to families through LINC Tasmania facilities across the state. St Giles and LINC Tasmania are seeking to improve access to telehealth options for people with disabilities across Tasmania, particularly in rural and remote areas by utilizing and promoting the spaces and technologies that LINC Tasmania has throughout its vast state-wide network. This provides opportunity for greater access to assessment and intervention for speech pathology, occupational therapy, physiotherapy, behaviour support and psychology, particularly for families for whom visiting a centre-based service is too difficult or prohibitive.

The project has been designed to develop an approach that will support library facilities to improve access to technologies for people with disabilities living across the state. This has commenced with the process of addressing the challenges of largely unrelated organisations in government and not-for-profit partnering together on telehealth, to provide a seamless service to clients. The organisations operate under different systems, different platforms and different booking systems, which presented initial concerns with confidentiality around data sharing, suitable and compatible equipment at each of the sites, booking logistics and the provision of a private area within a public space.

The intended outcomes of this pilot are to increase options and ability to access telehealth services across Tasmania, improve access to technology and digital inclusion for all citizens and build awareness of telehealth services for people with disability.

Intended outputs include training and induction for LINC Tasmania staff, extension of existing LINC technology, development of policy and processes to support access to telehealth services and a future rollout plan beyond the four pilot sites (one metropolitan, one regional, one rural and one remote).

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Building Interest, Systems and Skills to use Telehealth within Aboriginal Community Controlled Organisations in Victoria

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Most Aboriginal Community Controlled Health Organisations in Victoria have not embraced Telehealth due to a lack of training, infrastructure and resources.

In 2014, The Victorian Aboriginal Community Controlled Health Organisation (VACCHO), the peak body for Aboriginal health and wellbeing in Victoria, was funded to build Telehealth capacity in Victorian Aboriginal Community Controlled Organisations (ACCOs). The project aimed to improve patient service delivery through the reduction of medical and/or patient transport time to a specialist through the use of a telehealth consultation, and the subsequent increase in telehealth consultations.

The project initially funded a pilot that installed proprietary cameras and software that was unfit for purpose. Since this pilot, VACCHO has attempted to progress the project aims by raising awareness, providing support and offering training. Some approaches have not been successful while others are currently gaining some traction, especially those in partnership with external organisations. In particular, a partnership that began between Mallee District Aboriginal Services (MDAS) and the Royal Flying Doctors Service (Victoria) has provided a new way to regain ACCO's interest in telehealth. This has led to an memorandum of understanding signed between the RFDS and VACCHO, followed by seven other ACCOs in Victoria where Aboriginal Health Workers, nurses, practice managers and some GPs have received training and skills to use the platform. Building on this momentum VACCHO’s Telehealth Project Officer is building partnerships with several hospitals in the Melbourne and Gippsland regions to review current Aboriginal patients’ eligibility for telehealth and create pathways for Aboriginal people to access specialists quickly and to save both patient and ACCO staff time and money. VACCHO is also developing a telehealth unit to deliver in July 2018 within its Diploma of Practice Management to continue building the capacity and use of telehealth in Victorian ACCOs.

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eCYMHS: Expansion and Integrated Care

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eCYMHS, the electronic Child & Youth Mental Health Service, is a co-ordinated telepsychiatry service based in Brisbane which supports young people under 18 years and their families living in rural and remote areas across Queensland who are dealing with significant mental health issues. Support is provided by a team of Consultant Child & Adolescent Psychiatrists and two Senior Allied Health Staff via weekly videoconferences, quarterly outreach visits and email and telephone support to mental health clinicians in these areas. The complex interplay between mental health and developmental paediatric presentations has culminated in the establishment of specialised services to eCYMHS with the integration of a Speech Pathologist, Occupational Therapist and a team of Developmental Paediatricians. This multidisciplinary approach within a collaborative care framework aims to replicate, as closely as possible, mental health service delivery within metropolitan areas, thus minimising the need for families to travel away from home for care. Having a robust framework, a clear communication pathway with major players and a preparedness to be receptive to constructive feedback throughout the implementation process have been key learning outcomes for the eCYMHS team.

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Healthdirect Australia introduced a video call option to the Pregnancy, Birth and Baby service, giving users video access to this service in addition to the existing telephone and online facilities. This Video Consultation Capability (VCC) service uses open source WebRTC (Real-Time Communications) standards for real-time video, audio and data communication to implement video consultations for maternal child health nurse-led health advice and guidance.

Video call was successfully implemented in 2014, with the potential barriers identified in an evaluation of the staff training not being realised. The evaluation study identified a few unexpected potential barriers to successful transition from telephone to the video system. Most prominent were technical and training issues, and personal safety concerns.

The video call has operated successfully from the nurses’ viewpoint, with one minor failure - the less than successful uptake by consumers. This type of video health service is purely driven by the consumer, rather than the more traditional model of appointment based health professional directed video service. As such it was, at the time, the only health video consulting service relying on consumers to choose to make contact via video rather than the telephone.

Many improvement activities were undertaken to increase the call numbers all without success. While the analytics of the video call landing page show very acceptable numbers of visitors to that page, the number of completed video calls remains elusively low at less than 2%. Yet users of the video service consistently provide very positive consumer satisfaction feedback. One explanation for the consistent low uptake that has been suggested is that our cohort of new parents prefer the anonymity of the telephone over the visuals of the video.

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Clinical Chatbots and Webchat: A Case Study

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This case study examines two pilot projects conducted by Healthdirect Australia with direct relevance to rural and regional health consumers: a nurse triage webchat trial and a symptom checker automated chatbot. Both explored text-based chat interfaces for consumer clinical services. Our research indicates significant cohorts of the Australian population prefer interactions by text to those by voice, including Indigenous people and native speakers of other languages than English. Both trials took place within a clinical governance and risk management framework.

In late 2017 Healthdirect partnered with the nurse triage contact centre provider Medibank Health Solutions for a limited national trial webchat interface as an alternative to the 24-7 telephone service. It used the same clinical algorithms and triage nurses as the voice service. Data from the trial demonstrated differences in consumer behaviours between webchat and voice, including geographical usage (metro/remote/regional), demographics and severity of dispositions. The conclusions indicate how this channel can be used successfully for clinical triage in the future, particularly for rural communities, and integrated into consumer-focussed clinical helplines.

At the same time, Healthdirect launched a Facebook Instant Messenger version of its popular Symptom Checker website and app. This transformed several of the automated symptom flows into conversational language in a chat interface while maintaining the underlying algorithmic logic and clinical governance. Our research indicates social media messaging in general Facebook Instant Messenger in particular is very popular among Indigenous and linguistically diverse cohorts. This pilot is now ongoing and is being expanded. We'll share information about the use of the chatbot, the research underlying project design including use of Facebook Instant Messenger, the use of automated natural language interfaces, health literacy implications and the learnings from the project.

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Oral Poster Presentations
Sue’s Story: Remote Monitoring of COPD

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Sue is a 59-year-old smoker with emphysema who has had 15 emergency department presentations with exacerbation of COPD and anxiety over an eight-month period.

As Sue was assessed being level 4 (terminal), she was referred for monitoring by the Palliative Care team who felt that further in home support would benefit this lady. With the support of Corumbene Care, an in-home connected health monitoring solution and a personal alarm was installed in Sue’s home, where she was shown how to measure her vital signs using the telehealth hub and to answer a series of clinical questions to determine her current condition which are automatically transmitted to a monitoring centre where Registered Nurses compare the data to Sue’s ‘normal’ readings. Abnormal readings are flagged for follow up with the patient and her GP.

A COPD action plan by the Corumbene care team with the support of the Connected Health platform has allowed Sue to manage her conditions from home, liaise with a Registered Nurse and reduce her need for frequent unplanned Emergency Department visits. Sue has now been actively monitoring for six months and during this time she has had one hospital presentation that resulted in an admission. Sue has not called an ambulance since she commenced monitoring.

The palliative care team have since discharged her from their care and she has been reassessed as a level 2 – inactive. Sue now has increased confidence in managing her disease, has reduced anxiety levels and her weight has increased from 36kg to 42kg which is well on her way to her target of 45kg.

If this same program of client-centred care customised to the individual client and the addition of telemonitoring could be rolled out for other high needs clients the health system would benefit greatly.

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Challenges of a Large Multi-Centre Study on Mobile Health for Cardiac Rehabilitation Across European Countries

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In 2014, the Australian eHealth Research Centre (AEHRC), a joint venture between CSIRO and the Queensland Government, proved the effectiveness of using mobile health technology to deliver Cardiac Rehab (CR) programs in Australia. Although the intrinsic versatility of this technology is adaptable to everyday clinical practice its application in different cultural contexts and health systems needs to be investigated. Based on this premise, the AEHRC is currently exploring and internationally expanding the use of the CSIRO’s validated CR mobile platform in Australia through the DIVERSITY 1 study. The aim of the study is to recruit 80 patients in 6 months distributed in four European countries (Sweden, Poland, Belgium and Netherlands). The endpoints of this study are technology use and satisfaction from users, both patients and clinicians. In addition, we have initiated collaborative research proposals to other countries with different socio-cultural and linguistic characteristics such as Kuwait, Malaysia and Singapore. This approach entails potential opportunities of research collaboration but also substantial challenges likely to be faced during the course of these studies. These challenges can be categorized into: technical and methodological. To date, technical difficulties involved the translation of the software and materials into the respective languages and the sourcing of a central computer server to fulfil the required privacy issues regarding the storage of clinical data from patients of different countries. Methodological challenges arose from the need to adapt protocols, timelines and existing components of local CR programs to join a “lowest common denominator” program, acceptable to all clinicians from different countries.

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Literacy Assessment via Telepractice for Children with Reading Difficulties Living in Rural Australia

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Aim
Literacy difficulties have significant long-term impacts on individuals’ educational, employment and health outcomes. Therefore early and appropriate identification and intervention is critical. This is especially apparent in children living in rural and remote areas with the 2017 Australian National Assessment Program Literacy and Numeracy report indicating the highest percentage of children performing below the national standard for reading, attended schools in these locations. Access to experienced professionals who conduct standardised literacy assessments with children is limited in rural and remote areas. The emerging literature supports the potential feasibility of using telepractice to overcome barriers of accessing specialist literacy assessment. The current study aimed to determine the feasibility and reliability of telepractice assessments in children with reading difficulties using consumer-grade technology.

Method
Thirty-seven children, aged between 8 and 12 years, with reading difficulties, attended a multidisciplinary reading clinic. Children completed a large suite of literacy assessments including single word reading, reading comprehension, and spelling. This was delivered via a web-based application by a remotely located Research Assistant. A teacher was located with the child to support their engagement and participation. They also co-scored the assessments. Scores and qualitative observations of the two assessors were compared.

Results
Spearman’s correlation analyses revealed strong agreement between telepractice and face-to-face rated scores (.79 to .99). Bland-Altman plots indicated excellent agreement between derived scores. Parents reported a high degree of comfort with the telepractice assessments. Clinicians reported the audio and video quality was sound in most cases.

Conclusion
Web-based technology can enable remote delivery of literacy assessments. This has the potential to increase the availability of assessments to meet the significant needs of children who live remotely, in a timely manner and at their family’s convenience.

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Poster Presentations
A Structured Review of Factors Affecting Clinician Use of SMS to Support Healthcare Delivery in the Developing World

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Background
Currently, clinicians in the developing world are using emerging information and communications technology (ICT) platforms to support equitable healthcare access through outreach to patients in underserved regions. This largely uses short message services (SMS) through formal or informal administrative structures. This approach has demonstrated capacity to extend access and support provision of quality care, but to increase adoption difficulties that clinicians encounter using SMS must be addressed.

Aim
To identify factors that affect clinician adoption of SMS as a supporting platform for healthcare delivery in the developing world.

Method
PubMed and Scopus were searched for resources reporting issues affecting clinician use of SMS to support healthcare in the developing world. The search found 586 unique studies published in English between 2000 and 2017. After initial screening (title and abstract) followed by review of full text papers, 26 met the inclusion criterion.

Results
The selected papers used quantitative (n=16), qualitative (n=9), and mixed (n=1) methods. SMS was found to have been used for the following: collection of patient data (n=7), general communication (n=6), malaria reporting (n=4), maternal health management (n=4), HIV/AIDS management (n=3), and TB management (n=2). The most frequently reported issues affecting adoption were: available technology (n=12), cost and ownership of phones (n=8), training and education (n=7), and device friendliness (n=7). Other less frequently noted issues were: privacy and confidentiality (n=4), multi sectorial engagement (n=4), receiving technical service (n=3), and clinicians’ motivation (n=2).

Conclusions
These findings will help inform policy and future SMS use to facilitate healthcare delivery by clinicians in the developing world.

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Background
SMS-based mHealth applications are regarded as the commonest way of providing affordable mobile healthcare services to patients in resource limited communities. In spite of the benefits SMS-based mHealth brings, other issues arise in its use by patients in developing countries that must be addressed if increased adoption is to be realized.

Aim
To identify issues that affect (challenge or promote) patient adoption of SMS-based mHealth in the developing world.

Methods
A structured search and review of the literature was completed using PubMed and Scopus in December 2017. The inclusion criterion was to identify resources presenting issues affecting the adoption of SMS-based mHealth by patients in the developing world. The searches produced 571 resources, 556 unique papers after removal of duplicates, published between 2000 and February, 2018. All authors screened titles and abstracts using the inclusion criterion, with discrepancies agreed by consensus, leaving 25 resources. Full-text articles of these resources were retrieved, and screened a second time by all authors. Of these, 20 papers met the inclusion criterion and were analyzed. Each paper was reviewed by the authors individually, and findings discussed and agreed by consensus.

Results
The papers used quantitative (n=11), qualitative (n= 6), and mixed methods (n = 3). During analysis the papers were grouped as follows; supporting antiretroviral therapy (ART) in HIV/AIDS (n= 11), supporting ART in TB (n= 3), treatment adherence in children with complicated malaria (n= 2), assessing depressive symptoms (n= 1), blood pressure management (n=1), and supporting women during medical abortion (n=1). The most reported issues (in ten or more resources) were: privacy and confidentiality (n=11), cost and phone ownership (n=11), user characteristics (n=10), and availability of appropriate and effective technology (n=10). The less reported issue was language and literacy (n=5).

Conclusions
These findings will inform developers, corporate policy, and governments for future successful implementation of SMS-based mHealth in the developing world for patients.

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Telehealth Challenges - Key Lessons Learnt

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The poster will outline the main challenges during the roll out of a funded DHHS Telehealth project. It provides an insight into the challenges experienced in the planning, implementation and sustainability phases of the project. It will outline the experiences and challenges faced by clinicians, project partners and front-line staff.

The poster will provide an overview of the key learnings:

- Resources - what can realistically be achieved within a 12-month period?
- Sample size - does size really matter?
- Technology - what Telehealth platforms are available and what is being used within Victoria?
- Is Telehealth more time consuming than a face to face appointment and what if being done at a local level?
- Satisfaction surveys and data collection - what are the 'customers' saying?
- Sustainability - how long does change take to embed?
- Investment - funding vs organisation commitment to Telehealth?

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Using Telehealth as Part of an Effective Re-ablement Service

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In June 2013, the Adult Social Care and Health team, in partnership with Environmental Protection Careline services, commenced a year-long pilot project to assess the benefits of including telehealth as part of its Reablement Service. The initiative has been developed by a multi-disciplinary team including staff from St Helens Careline, nurses from Bridgewater Community Healthcare National Health Service (NHS) Trust and the Reablement Service.

The Reablement Service offers support in the community and at a five bed facility located with Brookfield Residential Home to help people return home after a stay in hospital, regain their independence and prevent unnecessary admission to long-term care homes.

The reablement unit has a Tunstall myclinic multi-user telehealth system, which is used to record the vital signs of patients on a daily basis. These readings are transmitted to St Helens Careline for triage, and verified readings outside the parameters set for the individual patient will raise an alert prompting Careline staff to take appropriate action. Community matrons can also log into the system remotely at any time, helping to inform the ongoing care plan and highlighting any cause for concern at an early stage.

The results of this initiative were that using telehealth as part of the Reablement Service enables clinical and social care staff to monitor the progress of patients, and intervene at an early stage if a possible problem is detected, preventing deterioration and possible re-admission to hospital. Integrated working is also supported, as staff from health and social care liaise on a daily basis and have access to the same, up-to-date patient information. Using the Tunstall myclinic system has enabled community matrons to monitor results remotely, saving approximately two days each week visiting Brookfield, time which is now spent supporting patients in the community.

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Diabetes Telehealth Service: Moving Forward, Diabetes Education and Endocrinology Support to Regional Patients in Western Australia

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Introduction
In 2008-2012 diabetes complications were a leading cause of potentially preventable hospitalisations, with regional WA rates above the state rate. In parallel, regional capacity for diabetes education remains limited. It is acknowledged that the provision of comprehensive diabetes education delivered by a Credentialed Diabetes Educator (CDE) results in better health outcomes for people with diabetes. CDE telehealth consultations are a feasible option in remote WA.

Method
The Diabetes Telehealth Service (DTS) Diabetes WA was established in partnership with WA Country Health Service and WA Primary Health Alliance to fill service gaps. This is the first CDE-led telehealth service in Australia offering face to face consultations via a multitude of video conferencing (VC) platforms to regional patients in WA. CDE consultations are offered to patients within their home, doctors surgery or local health centre. As of August 2017, patients with diabetes complications or comorbidities can be directly referred via their GP to the Diabetes Telehealth Endocrinology Service (DTES) operating monthly. Service effectiveness is measured by patient survey at initial appointment and on discharge.

Results
From March 2015 to February 2018 the DTS has seen 1687 patients (92 from priority populations) with 2161 occasions of service. 38 patients were referred to the DTES with the average wait time being 26 days. Average road travel saved per patient is 661kms.

Lessons Learnt
Establishing networks and shared care roles between local health professionals has resulted in greater acceptance of the DTS in all regions of WA with 62% of referrals from GPs. Delivery platforms have altered based on consumer demand for telehealth consultations direct to patients’ homes. Initial results have indicated that 92% of consumers are ‘extremely satisfied’ with telehealth and 78% indicated that the experience was as good as an ‘in person’ appointment.

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Focus Group Interview for the Development of Medical Consulting Services Between Physicians and Dentists Using ICT for Efficient ONJ Treatment and Prevention

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Osteoporosis is an increasing trend worldwide, and the most serious side effect of anti-resorptive medications in osteoporosis is osteonecrosis of jaw (ONJ). However, it is difficult to treat and prevent ONJ due to the communication of jaw necrosis between physicians and dentists. To solve these problems, physicians and dentists must share essential information about the same patients, and they should be able to make quick and appropriate judgements about the queries and communicate them efficiently to each other.

Therefore, a focus group interview (FGI) was conducted to investigate the basis of medical consulting services between physicians and dentists using ICT that enable rapid communication using structured information between physicians treating osteoporosis and dentists.

The study subjects were physicians who treat osteoporosis, dentists who treat ONJ and patients who were treated or are treated for ONJ. The contents of the study were problems and improvement of ONJ, necessity of ICT for prevention and treatment of ONJ, and necessity of cooperation between physicians and dentists.

In order to elicit various contents, the researcher prepared the research guide containing the contents of the questions and direction of the investigation. The FGI was conducted in a way that participants freely discussed the topic given in the FGI room, and the researcher observed the discussion process in the Mirror room.

In result, physicians, dentists and patients responded that close cooperation between internal medicine and dentistry was important. Based on FGI results, the development of medical consulting services between physicians and dentists using ICT for the effective treatment and prevention of jaw necrosis in osteoporotic patients can be achieved by: 1) reducing the time and resources needed to reach the optimal medical decision, And 2) prevention of unnecessary interruption of osteoporosis treatment.

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Telehealth in Aboriginal Communities

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Telehealth has numerous documented benefits for rural and remote communities. In many of these communities, access to technology and infrastructure can be limited but there is generally accessible sites close to home. One of the limiting factors to the successful implementation of Telehealth is community acceptance of the technology to deliver services. The Narrandera Aboriginal Community in the Riverina (11% of the community identify as Aboriginal or Torres Strait Islander) is situated one hour from both the Wagga Wagga Base Hospital and Griffith Base Hospitals with no options for public transport. Community feedback has found that many of the community members are unable to attend appointments at the hospital due to limited access to a vehicle, costs associated with travel (+/- accommodation), availability of a carer and time away from school or work. The MLHD has been working with the Narrandera Aboriginal Community (Elders and community members) to develop culturally appropriate processes to deliver services via telehealth to address the communities’ concerns and barriers to access services in Wagga Wagga or Griffith.

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Tele-Palliative Care

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The ACI Palliative Care Framework outlines a tiered escalation framework to ensure that palliative care patients receive timely and appropriate levels of care. Telehealth enables effective and efficient communication as part of the escalation process from community nurse to palliative care physician. The MLHD first implemented Tele-Palliative Care in 2016 however due to a number of technical issues, was placed on hold. It is these technical issues that have led to the service being reviewed to improve connectivity, scalability and security while also improving usability for clinicians and consumers.

This service is currently a proof of concept in the Tumut Cluster located in the snowy mountains region of NSW. During the winter months it is common for roads to be closed due to ice/snow while in summer there is significant bushfire risk. However due to the geographical nature of the area, mobile network coverage has presented as an issue leading to alternate access process and points being developed.

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The Journey of Telehealth for Bendigo Health Psychiatric Services 1996 - 2018

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1. Bendigo Health, Victoria, Australia

This poster will describe the development of Telehealth Services for Bendigo Health Psychiatric Services over a 22-year period 1996-2018. Bendigo Health Psychiatric Services covers a large Geographical area in the Lodden Mallee Region of North Central Victoria and is why Telehealth is a major tool to conduct clinical services, receive education and conduct administrative work. This presentation will discuss how Telehealth has developed, its strengths and weaknesses and drivers that have promoted its use and blockers that have impeded the effectiveness of Telehealth.

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The Importance of Education to Enhance Image Quality for Accurate Diagnosis in Dental Trauma Patients

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In the dental field, tooth trauma is one of the most appropriate indications for teleconsultation as precise initialization and appropriate first aid are needed. In the absence of an expert at the time of tooth trauma, most people have built-in camera phones that are the most appropriate tool for teleconsultation. In this study, proper camera setting and photographing were carried out to establish proper protocol for teleconsultation in dentoalveolar trauma using mobile phones.

Sixty adults were divided into general population and expert group. Front camera and rear camera images were taken before and after the training of camera photography protocol. The images of the photographed images were read by two experts (image dentist and oral surgeon).

In both groups, only the frontal view was taken without the occlusal view before the camera training, the photograph was taken without proper retraction, and the focus of the photograph was not well focused. After the instruction, these problems were significantly reduced, and it was confirmed that photography training could be useful.

The International Association of Dental Traumatology (IADT) has first-aid procedures used for patient education. Adding the protocol presented in this study based on the first aid method presented by IADT, it can be used as a patient instruction for quick and accurate diagnosis in the case of a dental trauma patient.

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What is the Place for Video-Call in Ambulatory Services in a Specialist Hospital?

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The Royal Victorian Eye and Ear Hospital (Eye and Ear) is Australia’s only specialist eye, ear, nose and throat hospital, and the largest public provider of ophthalmology and ENT services in Victoria. The Eye and Ear treats around 200,000 patients per year with a significant proportion of patients treated in the ambulatory setting. In 2016/2017 there were 150,000 appointments in 59 specialist outpatient clinics.

The Eye and Ear received two grants from the Department of Health and Human Services (2017 & 2018) for the following telehealth projects:

1. Telehealth improving the patient experience in a tertiary specialist hospital
   - A collaboration with Northeast Health Wangaratta (NHW) to establish telehealth capacity in specific specialist clinics
     o Balance Disorder and Ataxia
     o Neuro-ophthalmology
     o Cochlear Implant

2. Expanding telehealth to high volume, low complexity clinics in a specialist tertiary hospital.

Learnings from the initial project have influenced the strategic approach to telehealth at the Eye and Ear. The high use of specialist diagnostic services in the nominated clinics limited patient selection. As a result, it was recognised that the video-call modality is more readily adopted within low complexity, high volume clinics such as post-operative review clinics. The focus is now on implementing video-calls within these clinics.

Other learnings relate to use of telehealth technology in a zero client (virtual desktop) setting, developing a framework and associated resources for implementation of video-call that is transferrable to a range of clinics, and successful approaches to embed telehealth as business as usual in Ambulatory Services. Whilst the focus is on low complexity, high volume clinics a key success in the trial with NHW was the ‘mapping’ appointments for patients following cochlear implant surgery. This required the use of additional technology in collaboration with video-call, and opportunities to further incorporate technology in telehealth will be investigated.

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A Comprehensive Review of Tele-Nursing in Japan

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Aim
The study aims to explore current study and trend of tele-nursing in Japan by conducting a comprehensive review of tele-nursing in the past one decade.

Methods
We searched IGAKU-CHUOU-ZASSHI database (The most popular database of Japanese medical articles) for original peer-reviewed studies on implemented eHealth tools that reported nursing activities. We used the keywords “tele-medicine” (“ENKAKU-IRYO” in Japanese) and “nursing” (“KANGO” in Japanese). We conducted the systematic review by following an outcome framework, with two of the authors independently reviewing the articles written in Japanese.

Results
Of 397 primary identified articles, 67 articles were reviewed. Randomized studies were only one article. Case studies were three articles. Among the included studies, 17 studies about developing tele-nursing systems and 25 studies about verified the effectiveness of developed tele-nursing systems were reported. As a remote nursing care system, systems such as automatic monitoring of medical equipment, support for the patient at home, watch over the elderly living alone, and information supply between multiple occupations were developed. 11 studies about nursing practice by tele-nursing system were reported. Nursing practices by tele-nursing system were reported for self-management of type 2 diabetes and for watch over the elderly. Other cases reported that health guidance by tele-nursing was effective in improving the health of the elderly.

Conclusion
Current studies about tele-nursing in Japan were often targeted at the elderly at home. The reason may be caused by Japan’s rapid falling birth rate and aging population. However, it was confirmed that tele-nursing in Japan is at the stage of developing the system, and it has not reached the evaluation of the contents of nursing practice. In addition, there were very few studies about mental health or psychiatric nursing practice by tele-nursing.

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Use of Telehealth for Delivering Health Care Within Correctional Settings: A Scoping Review

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Prisoners are an underprivileged community with poor accessibility for health service due to complex socio-cultural, institutional and personal factors.

**Aim**
To examine the use of telehealth to deliver health care services at correctional settings.

**Methods**
A scoping review was conducted using the JBI protocol. A comprehensive search of the databases for peer-reviewed studies from the PubMed, Embase, CINAHL, Informit, Cochrane Central Register of Controlled Trials, PsycINFO and Scopus was conducted between January 2000 and April 2018. The review included prisoners of any age in any clinical condition (physical/mental) using any type of telehealth intervention for clinical support/services in correctional settings. Studies directed to assess technical feasibility, studies related to education and training and review papers were excluded from this review.

**Results**
Of the 1143 articles identified via the initial search, title search resulted in 153 articles. Seventy-four articles were included in the final review and were analysed. Thirty-five of them (47.3%) were review articles or perspective pieces related to prison telehealth. The rest (n=39; 52.7%) were original research articles. Most of them were published during 2010-2018 period (n=21; 53.8%) and most were conducted in USA (n=26; 66.6%) followed by France (15.4%) and Australia (10.2%). There were seven (18%) interventional studies. Others were descriptive studies (n=23), costing studies (n=6), mixed method (n=2) and qualitative studies (n=1). Six out of seven intervention studies were focused on psychiatric interventions and the remaining one on tele-dentistry. Common health problems addressed by telehealth were psychiatric disorders (tele-psychiatry=13) and eye problems (tele-ophthalmology=4). The commonest telemedicine intervention was synchronous videoconferencing (n=21) while 9 of them (23%) have used asynchronous interventions. Telehealth was identified as a cost saving intervention within prison setting.

**Conclusion**
There is gradual increase of information about healthcare service delivery within correctional facilities using telehealth for the last two decades.

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Supporting Universal Healthcare: Brazilian Telehealth Programs

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Every Brazilian has the right to receive free health care, in accordance with the Brazilian Constitution, including dental care and medicines. In practice, the Unified Health System (SUS) provides health care for 80% of the population. A strong private sector services the remaining 20% of the population. SUS is funded by federal, state and municipal taxes to provide primary, hospital, specialist care and diagnostics.

This poster describes the support of telehealth centres for primary health care with examples from the state of Santa Catarina. Telehealth Centres are established in 23 of the 27 Brazilian states, supporting professionals in primary health clinics through on-line continuing education, professional development, asynchronous and synchronous support services using web, telephony and video technologies to answer questions about management of cases and other issues. States such as Santa Catarina have large tele-diagnosis networks for cardiology, radiology and dermatology. Tele-triaging of primary to secondary and tertiary care referrals is well established in many states, using evidence-based protocols and pathways.

Key case management issues are compiled into formative second opinions to provide evidence-based guidelines for national use. Brazilian Telehealth Centres operate on a large scale and have been shown to improve health outcomes and reduce costs.

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Country people in particular face significant barriers accessing specialist healthcare relating to distance, transport and cost. Telehealth is a key strategic initiative for health service providers to help address these important access issues for country and metropolitan citizens. Increasing access to clinical telehealth services relies heavily on public awareness, consumer and clinician advocacy.

Telehealth services have increased in WA by 79 per cent in the last three years and they remain a very small proportion of all outpatient consultations for WACHS residents.

In June 2017, WACHS held the inaugural Telehealth Awareness Week to increase community awareness of the benefits of telehealth. Following the success of 2017, Telehealth Awareness Week 2018 expanded significantly with a strengthened focus on the clinician voice added to the consumer perspective. WACHS worked closely with key health partners, workforce agencies, consumer councils, non-government organisations and metropolitan health services to reach a wider audience. The 2018 event featured an integrated communications strategy including a range of advertising and promotional activities and an extensive, highly successful social media campaign. The 2018 TAW involved multiple health organisation Chief and Executive leads, clinicians, general practitioners, consumers and community members all promoting the value of telehealth to improve access to health services for all.

Presentation of the Telehealth Awareness Week 2018 components and evaluation results will support jurisdictions to enhance their promotion and inform a proposed National Telehealth Awareness Week for 2019 that is promoted by State and Territory consumers, carers and clinicians.

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Hyperacute Stroke Care – Improving Access and Equity for People in Country WA

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The Acute TeleStroke Project (“Project”) improves quality and equity of access to acute stroke care closer to home for the WA South West population by incorporating telehealth in the Bunbury Hospital (BH) acute stroke pathway; enabling timely consultations with metro-based Fiona Stanley Hospital (FSH) stroke consultants. This assists clinical decision-making and supports the provision of hyper acute stroke treatments, including reperfusion therapies (clot-busting drug provided at BH and rapid transfer to metro for mechanical clot retrieval). A dedicated BH project officer facilitated development of local hyperacute stroke processes and protocols involving ED workforce, imaging service providers, BH pharmacy, and emergency transport services. Telehealth equipment provided included wireless VC telecart utilising Polycom technology within BH ED, and a videoconference unit (HDX 4500) at FSH, with workforce training in regards to usage.

Outcomes of the Project (August 2015 - June 2018): 1) 76% of patients presenting to BH ED receive Acute TeleStroke Consultations, supporting access to expert acute stroke management advice. 2) Clot-busting medication now provided within BH ED (six cases to date) resulting in dramatically reduced disability. 3) 100% increase in patients transferred to metro for mechanical clot retrieval. 4) Improved quality of care and patient satisfaction, bringing Perth-based stroke consultants “into the rural ED room”. Now rolling out to other WA country regions.

Lessons learnt include: 1) 24/7 consultant access (vs afterhours access to registrar only) prior to service commencement would reduce service variability and subsequent impact on rural clinician service uptake; 2) Mobile telecart use across other diagnostic conditions would improve uptake within Acute TeleStroke Service; 3) Engaged local steering group incorporating clinical and executive workforce is required to drive Project/service development and implementation; 4) Identified rural “stroke clinical champions” required for ongoing frequent process updates and staff training. 5) Simultaneous workforce stroke training initiatives are essential.

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VCCC Tele-trials Program: Barriers and Enablers to the Implementation of Tele-trials Across Victoria

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4. Townsville Cancer Centre, Queensland, Australia
5. Western Health, Royal Melbourne Hospital & The Peter MacCallum Cancer Centre, Victoria, Australia
6. Walter and Eliza Hall Institute of Medical Research, Victoria, Australia

Aim
The VCCC Teletrials Program aims to increase access to cancer clinical trials for regional Victorians by reducing the burden to participation. The program will test the feasibility and acceptability of a teletrials model across metropolitan and regional Victoria.

Methods
The VCCC defines a tele-trial as: ‘a clinical trial made available and accessible to Regional and Rural locations through technology and the development of an appropriate model of care’. VCCC Regional Oncology Leads were appointed to champion the Teletrials program. The VCCC Teletrials Program will endeavour to implement a tele-trial across a number of different scenarios, including:

- Pharmaceutical trial, Metro site to Regional site;
- Investigator initiated trial, Metro site to Regional site;
- Investigator initiated trial, Regional site to Satellite site;
- Satellite site to Satellite site;
- Satellite site to Metro site;
- Metro site to Satellite site.

The program will utilise the COSA Australasian Teletrial Model. Each scenario will evaluate acceptability of the model regarding: disease and phase of trial; delegated roles and responsibilities; governance and regulatory arrangements; transfer of source documentation; shipment and prescribing of investigational product; and reporting of serious adverse events.

Results
The VCCC Teletrials Program is initially implementing an Investigator Initiated Trial where Peter Mac will be the Primary Site and Border Medical Oncology and Bendigo Health will be the Satellite Sites. Barriers to implementing teletrials exist at all levels of the health system, including regulatory and governance processes, and concerns by clinicians about devolving responsibilities to satellite sites. Key enablers to the program have been 1. Clearly defining roles and responsibilities in a Supervision Plan 2. Establishing robust regulatory agreements and SOPs 3. A simplified trial design, which will allow key issues to be addressed before more complex trials are implemented.

Conclusion
The VCCC Teletrials program will implement a tele-trial across a number of different scenarios leading to the establishment of an acceptable model for improving regional access to clinical trials.

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Teledermoscopy emerged from the need to offer equal access to the dermatologist on suspicion of skin cancer. Many dermatologists use teledermoscopy to seek a second opinion from experts for difficult cases. Teledermoscopy, in the hands of the primary care practitioners (PCPs), is not broadly introduced so far. However, half of the experts express positive attitudes towards using teledermoscopy under specific conditions. Teledermoscopy may reduce the number of unnecessary excisions and could decrease the waiting time. Most of the existing studies were not designed to evaluate efficacy and safety.

We introduced teledermoscopy in Västerbotten, Sweden, in 2011 in a small pilot study together with general practitioners from Skellefteå, a city located 140 km north of Umeå. In this pilot study, we received 111 referrals from three primary care centres and reported the preliminary results that about 60% of patients did not need any diagnostic or therapeutical procedure. After these results, we prepared a broader implementation plan to offer this service to the whole county. The teledermoscopy service was introduced countywide throughout Västerbotten in May 2014 (33 primary care centres) in close collaboration between Dermatology and Primary Care. This service currently provides teledermoscopy consultations to all primary care centres and was the first of its kind in Sweden. More than 10000 teledermoscopy queries have been made since 2014. This presentation shows the first results of this intervention.

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