

Regional Emergency Department Telehealth support to Urgent Care Centres after hours in Northeast Victoria, Australia

A study of the technological, human
and system factors for success

Final Evaluation
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Acronyms

Abbreviation	Full Form
ACRRM	Australian College of Rural and Remote Medicine
AIHW	Australian Institute of Health and Welfare
AWH	Albury Wodonga Health
CEO	Chief Executive Officer
ED	Emergency Department
FTW	Failed To Wait
GP	General Practitioner
GVH	Goulburn Valley Health
HD	High Definition
HRHA	Hume Rural Health Alliance
ICT	Information and Communication Technology
ISBAR	Identify, Situation, Background, Assessment and Recommendation
NH	Northern Health
NHPF	National Health Performance Framework
NHW	Northeast Health Wangaratta
QOS	Quality of Service
RN	Registered Nurse
SRHS	Small Rural Health Service
TH	Telehealth
UCC	Urgent Care Centre
VEMD	Victorian Emergency Minimum Dataset

Executive Summary




In May 2013, the Victorian Department of Health supported funding for Northeast Health Wangaratta (NHW) to oversee implementation of the Hume Region Emergency Department Telehealth Project. A broad range of stakeholders formed a project steering committee chaired by the CEO of NHW. Membership included representatives from the Department of Health, Hume Rural Health Alliance (HRHA), the region's Medicare Locals (Hume and Goulburn Valley), Ambulance Victoria, University of Melbourne and key staff at NHW.

The main aim of the project was to develop an after-hours emergency department telehealth service across the Hume region that would support the local General Practitioners (GPs) to maintain a 24 hour medical service to the Urgent Care Centers (UCCs) based in Small Rural Health Services (SRHS).

The telehealth service was offered to patients presenting afterhours at UCCs with low acuity problems – mostly Triage Category 4 &5, and non-complex Category, 3, when no on-call GP was available. These patients were referred to the Afterhours telehealth service generated through NHW Emergency Department (ED) to have a real time video consultation with a NHW ED doctor. At the time of this evaluation, one ED (NHW) had been connected to eleven UCCs (spoke sites).

The evaluation of this project was led by Northeast Health Wangaratta (NHW) in collaboration with the Health and Biomedical Informatics Centre (HABIC), University of Melbourne and the Department of Rural Health, University of Melbourne, Rural Health Academic Network (RHAN). HABIC shared responsibility for the analysis of the data collected by Northeast Health Wangaratta. The participant surveys, focus group and interview data was analysed and reported on by HABIC. The clinical data, derived from a specially constituted NHW ED telehealth database, was analyzed and reported on by Northeast Health Wangaratta. Full ethics approval for the evaluation was given by the HREC at NHW.

This evaluation focuses on the technological, human and systems factors affecting the people who used telehealth during the period of its implementation. Data analysis was based on the Australian Institute of Health and Welfare (AIHW), National Health Performance Framework (NHPF). Participants in the evaluation included patients, nurses, ED junior and senior doctors, GPs, clerical staff and Chief Executive Officers (CEOs) or Directors of Clinical Services/Nursing.



Clinical Outcomes

276

Number of patients referred to NHW for an ED telehealth consultation, between April 2013 and 31st May, 2015

Highest number of referrals:
Benalla (79), Corryong (74), and Yarrawonga (73)

79

74

73

68%

Percentage of presentations that were Category 4

The average age of patients (SD 27 yrs, median 39 yrs)

42

144

Number of patients telehealth prevented from travelling beyond their local hospital after-hours (These patients would have been referred to the regional centre under the UCC clinical guidelines if no telehealth was in place)

Number of patients were discharged home after the telehealth consultation

53%

20%

Number of patients that were transferred to the nearest regional ED

Number of telehealth patients that failed to wait

8.9%



Six evaluation questions were posed and the findings are as follows:

1. To what extent has telehealth impacted accessibility to care?

All participants acknowledged that telehealth had improved access to care. It provided an alternative way for patients to “see” a doctor, during the after-hours. The wait times were perceived by the majority of patients as being shorter in comparison to their experience of previous face to face consultations at an ED. Telehealth was perceived by all participants as important in reducing car and ambulance transfers, especially in the night when it may be unsafe to drive to a regional centre. Being part of a particular cultural group had no impact on a patient’s access to care via telehealth. It was unclear how aware the community was of the possibility to access afterhours telehealth.

2. To what extent had telehealth impacted continuity of care?

Telehealth supported continuity of care. Technology, the sound and visual aspects were found to be good, with the exception of occasional minor glitches. In regard to administrative procedures, paperwork was received and sent in a timely manner, prior to and after the consultation. Some nurses however reported the paperwork referral process to be time consuming and repetitive - greater familiarity with the system over time seemed to reduce these perceptions. Patients were advised by the telehealth doctors when required, to make a follow-up visit their GP. However, GPs reported that this did not occur and they did not receive letters informing them about their patient’s after-hours telehealth consultation. While GPs in the longest running telehealth site were very aware of the afterhours service and highly supportive of it, GPs in some other sites reported little knowledge of the service and did not feel they or their health service would make use of it.

3. To what extent had telehealth impacted the responsiveness of care?

Patients and clinicians expressed positive opinions in regard to responsiveness. Patients, clinicians (junior doctors, senior doctors, nurses) and clerical staff were treated with dignity and respect. The patient’s confidentiality and privacy was maintained and they felt that they were able to make decisions and choices about the care they received. There appeared to be no difference between a telehealth consultation and face to face consultation in this regard.

4. To what extent has telehealth impacted the effectiveness of care?

Clinicians reported confidence in being able to provide care that achieved the desired outcomes. However, while most clinicians were aware of guidelines around setting up a telehealth consultation, choosing the appropriate patients and completion of paperwork related to the consultation, some were not. Most of the nurses and junior doctors had received training in telehealth. The clinicians reported that telehealth did not add to their levels of work place stress; however some reported feeling low levels of clinical confidence if the case required physical examination. Some nurses reported that they were hesitant to use telehealth stating that the administrative procedures were too time consuming. Others stated that even though a patient could have been referred to telehealth they felt they had the necessary experience to resolve the issue on hand and did not need to make the referral. Importantly all clinicians highlighted the importance of trusting the nurse/doctor at the other end.

5. To what extent had telehealth impacted the safety of care?

The specially constituted NHW ED telehealth data base was audited by a senior ED physician with a finding that the referrals for telehealth consultations were in line with the telehealth guidelines and the management of care was clinically appropriate. The administration required to manually maintain a separate data base for telehealth presentations was resource intensive and over time is considered very difficult to sustain. The Victorian Emergency Minimum Dataset (VEMD) includes de-identified demographic, administrative and clinical data detailing presentations at Victorian public hospitals with designated Emergency Departments. The VEMD has no provision for identifying telehealth consultations therefore these episodes had to be recorded manually and separately, resulting in an incomplete data set with implications for accurate long term assessment of safety and quality.

6. Is telehealth a sustainable initiative when costs & human resource issues are considered?

Telehealth is sustainable. The higher management understood the potential of telehealth and wish for the service to be continued and expanded. They were also aware of future costs (equipment, maintenance and regional telehealth governance). The full advantages of afterhour's telehealth in supporting UCCs and GPs have not been fully realized. In mature sites improvement is evident in GP lifestyle and retention. Time is required for GPs and nurses to adapt and utilize the technology and its potential to enhance after-hours care.



Recommendations that emerged from the findings were:

Increase awareness of after-hours telehealth with General Practitioners and the community: Increased awareness amongst the community may lead to more timely access to care through the use of telehealth rather than waiting for their GP to be back on call. Notwithstanding, there needs to be a fine balance between providing timely access to urgent care afterhours without creating a defacto afterhours primary care service. GPs that are currently comfortable maintaining their own afterhours care arrangements without the telehealth system may benefit from occasionally using the system before they reach the point of burnout.

Guideline around GP letters: At the time of this evaluation, there was no guideline regarding ED telehealth doctors sending routine letters to GPs post a telehealth consultation. Guidelines around this issue could support continuity of care through improved communication amongst the afterhours ED healthcare provider and GPs in addition to raising awareness of the service to the GPs.

Including telehealth data in the VEMD: At the time of this evaluation details of a telehealth consultation were recorded in a specially created local database. This led to an increase in administrative workload and an incomplete clinical data set. This process is unsustainable beyond a project phase. A new variable inserted into the VEMD identifying telehealth patients is strongly recommended. State-wide quality and safety data for telehealth consultations can then be directly compared with standard care.

Education and training: Embedding of ED telehealth training into each health service education and training program for all clinicians in the UCCs and EDs utilising the Victorian Regional Health Service E learning Network (ReHSeN). Telehealth training videos could assist this process. A junior Doctor video and a general instructional video have already been produced, and a follow-up video targeting nurses is in train to occur post the findings from this evaluation.

Including telehealth in broader rural health curriculum: Implementing telehealth into undergraduate health curriculum would enable future health professionals working in rural areas, to have an understanding of telehealth and its use for providing care. It could 'normalise' telehealth.

Ongoing regional leadership and governance of telehealth: To fully embed afterhours telehealth and grow its wider uptake beyond project phase through engagement of other hub sites, consideration needs to be given to a regional telehealth governance officer position.

Conclusion

This evaluation of the Hume Region Emergency Department Telehealth Project concludes that from a technological, human and systems perspective, the use of telehealth for afterhours urgent care in low acuity presentations is successful and sustainable. The findings point to high acceptability amongst the patients who use it and levels of acceptability among clinicians proportional to the maturity of the telehealth implementation at their site. GPs and UCC nurses need time to adopt the technology and understand its benefits. The use of telehealth in the Hume region has facilitated timely access to urgent care in low acuity presentations for patients outside of the regional centers and could in time become routine practice.





Introduction




The Australian College of Remote and Rural Medicine, recognized in its submission to the after-hours primary care review, that the provision of after-hours care to rural and remote areas was not just important, but critical for improving patient outcomes and reducing inequities in access to after-hours care (Australian College of Rural & Remote Medicine, 2014). Rural doctors were overworked across the country: In 2011, the GPs working in remote areas worked an average of 45 hours per week, in comparison to 43 hours for those working in regional areas and 42 hours for those working in major cities (Australian Bureau of Statistics, 2013). Rural GPs provided a range of services, including primary and acute care, after-hours and emergency services (Jackson, 2014). The difference in location and number of doctors in regional and remote areas had meant that patients had to travel further to seek care. 10% of patients who lived in outer regional and remote areas of Australia had to travel more than 1 hour to access a GP (Australian Bureau of Statistics, 2013). This indicated that the GPs were overburdened and the patients could not easily access healthcare locally.

Access to healthcare after-hours in regional and remote Australia could be improved with the use of telehealth. The Department of Health, Australia, provided the following definition of telehealth services, which is applicable to this study:

'Telehealth services use information and communications technologies (ICTs) to deliver health services and transmit health information over both long and short distances. It is about transmitting voice, data, images and information rather than moving care recipients, health professionals or educators. It encompasses diagnosis, treatment, preventive (educational) and curative aspects of healthcare services and typically involves care recipient(s), care providers or educators in the provision of these services directed to the care recipient.' (Australian Government Department of Health, 2015).

Background on Hume Region Emergency Department Telehealth Project

The Hume Region Emergency Department Telehealth Project, funded by the Victorian Department of Health, aimed to develop and implement an after-hours emergency department (ED) telehealth service across the Hume region. It aimed to establish a region wide, real time, videoconferencing service that would provide support to staff at fourteen small rural health service or SRHs, in managing unplanned presentations to the Urgent Care Centers after-hours. A multiple hub and spokes model of service delivery was pursued, with services provided by four emergency departments to UCCs in their respective catchments, thereby supporting existing patterns of referral.



Site Specific Details

At the time of this study, one ED (at NHW, the telehealth hub) had been connected to eleven UCCs (spoke sites). A Memorandum of Understanding (please refer to Appendix M) was signed by each participating health service detailing the agreed service provided by NHW. These agreements satisfied ACRRM guidelines for telehealth by including a robust, uniform process of referral and consultation that was integrated into the ED workflow.

Local variation in agreement existed for time and days of service, and triage category. Nine sites received overnight services for Australasian Emergency Triage Scale 4 & 5 presentations, and three of these sites also received weekend service. GPs at these sites were contacted for Category 1, 2 and 3 presentations. Two other sites received a fortnightly and monthly weekend service, when there was no GP on-call. The service was suitable for those presenting with non-complex conditions not requiring admission to hospital. Support was also given to staff in UCCs in decision making for more complex presentations, and to provide interim care to patients before transfer to the nearest ED. The Australian Emergency Triage Scale categories are defined below:

- Category 1:** Immediately life-threatening
- Category 2:** Imminently life-threatening
- Category 3:** Potentially life-threatening or important time-critical treatment or severe pain
- Category 4:** Potentially life-serious or situational urgency or significant complexity
- Category 5:** Less urgent. (Australian Government, Department of Health and Ageing, 2009)

The service included diagnosis, advice and treatment of patients

Telehealth Referral Process

As seen in **Figure 1**, the process has been developed to replicate, as closely as possible, what occurs when a patient physically presents to NHW ED: the nurse, at the UCC assessed the patient and if suitable for telehealth completed, scanned and emailed the ISBAR referral (Identify, Situation, Background, Assessment and Recommendation) to the ED. The nurse then telephoned the ED reception to inform and provide details of the patient to the receptionist. They then spoke to the triage nurse who would enter the telehealth patient into the ED 'queue' and give an estimated waiting time. At the time of consultation, the ED doctor would telephone the UCC nurse to ensure site readiness for telehealth review before linking by video (telephone consultation rarely used and permissible only in the event of technical issues). Documentation of the telehealth consultation was recorded by the nurse on UCC medical history, as for face-to-face consultations. Medical history notes recorded by the ED doctor were completed, then scanned and emailed immediately to the UCC by the ED receptionist prior to storage as per standard face to face care in the Health Information System.

System Details

The telehealth system utilized Polycom videoconferencing units - in all but one UCC, a Polycom Practitioner Cart was used and a Polycom desktop unit was used at Northeast Health Wangaratta. The prac carts were easy to use - the UCC nurses had only to move the prac cart to the desired position at the patient's bedside, and turn on the power. Dialling and camera control (panning and zooming in/out) was controlled by the doctor at the regional hospital ED. More details about the system are provided in the next section entitled System Details. The network, hardware and software details are provided below:

Network

An internet connection of sufficient bandwidth is required to deliver high speed data exchange. A minimum bandwidth of 10 Megabits is required for reliable, secure, high quality videoconferencing used for medical assessment and treatment of the range of patient conditions presenting in UCCs and EDs. To provide uninterrupted quality of videoconferencing (data exchange), part of the bandwidth was reserved solely for videoconferencing - this is called Quality of Service (QOS). This prevents compromise in quality of video or dropouts, when the internet was being accessed by other users in the facility.

Internal wireless networks within facilities utilised the internet connection at the site, therefore the quality of videoconferencing was dependent on the size of the bandwidth. Wireless connections delivered a marginally inferior quality of video to cabled connections, however mobility of equipment in a small health service was required. Use of mobile devices for videoconferencing was limited by cellular coverage and Wifi access and capacity. Areas tested in the Alpine region were plagued by 'black spots' and poor internet - the latter should be greatly improved with roll out of the National Broadband Network. Use of mobile devices for ED telehealth was feasible and achievable in areas where sufficient bandwidth was available.

The hospitals required 10mb links - 1-2mb was reserved for video conferencing bandwidth for telehealth. Hospitals fully utilised 4 MB links for telephones (IPTel), Data (applications and internet) and poorer quality VC calls (0.5mb)

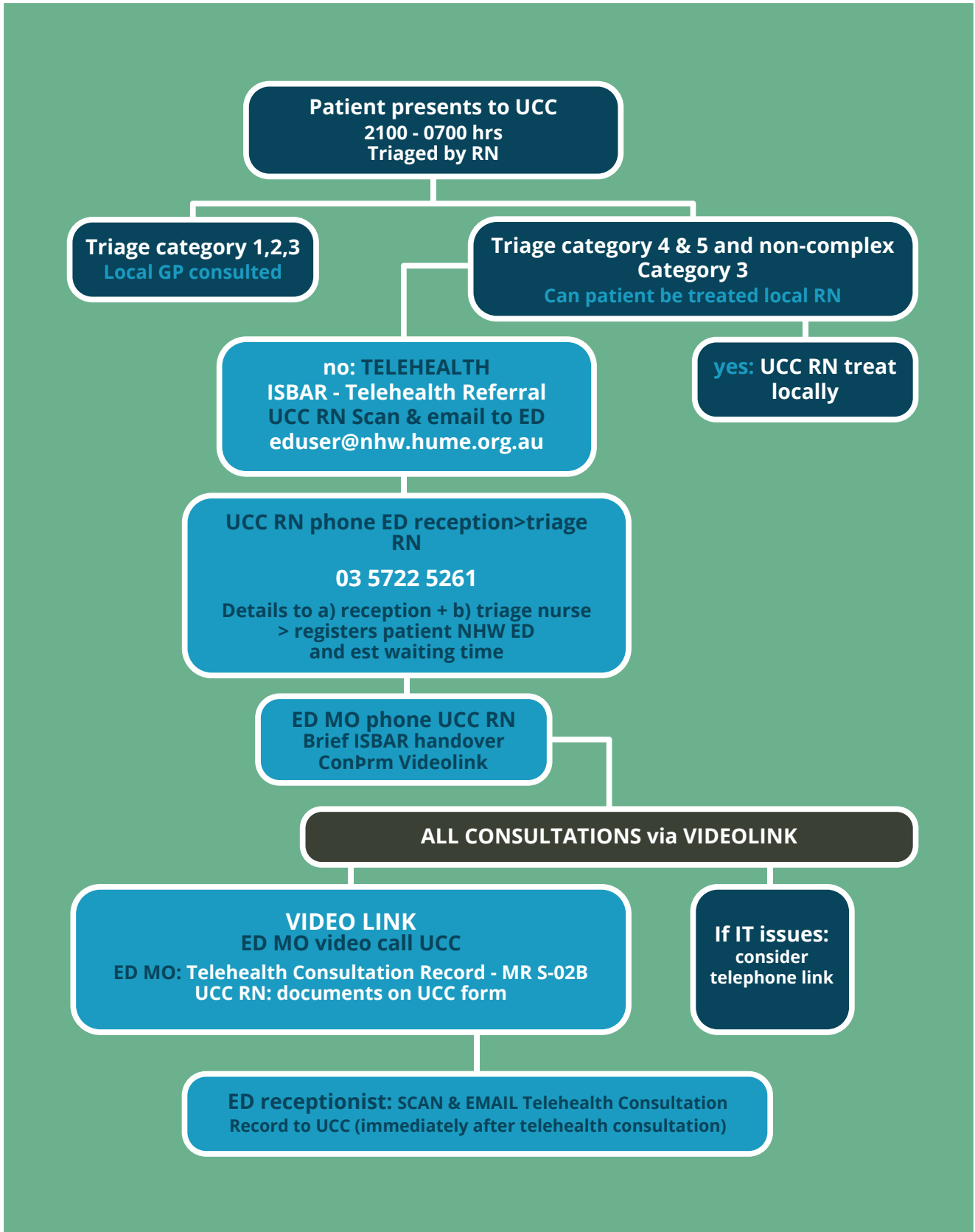


Figure 1: Flowchart highlighting ED telehealth process

Hardware

In consultation with participating health services, project funding was used to purchase fourteen Polycom Practitioner carts and one Polycom desktop unit, to be used for the delivery of ED telehealth service. Polycom HDX 4500 desktop units were used for delivery of service from an office space in the ED. The considered advantages of Polycom Real Presence practitioner carts in Hume region were:

Standards based technology: used in many health services across Victoria

Easy for remote clinicians to use with only 2 steps involved: move prac cart to location & switch on power; all other mechanisms controlled from service provider end, for example, initiating call, panning & zooming camera

Ports for optional accessories when telehealth matured, as determined by health services: otoscope, ophthalmoscope, stethoscope, high magnification camera

All other VC units in Hume region were Polycom: existing organisational knowledge of operation; easy access to the Hume Rural Health Alliance (HRHA) directory; practice runs to other VC units possible within health service; existing membership with HRHA / after-hours service by Telstra

Software

Polycom Real Presence software was selected to connect mobile devices and desktop computers to practitioner carts in a number of sites, for the following reasons:

- **Free to members HRHA (included in membership), no extra licensing or service fees**
- **Direct access to HRHA directory**
- **Interoperable with prac carts via point-to-point connection**
- **Alternate software was not suitable for use in Hume UCC setting**
- **An upgrade to the HRHA server using project funding was made to support Polycom Real Presence software**



Literature on telehealth in Emergency Care

A detailed description of the search strategy for the literature review is provided in Appendix A. The literature on the use of telehealth for the provision of after-hours care was limited. There was coverage around the topic of telehealth in emergency care, but these were quite different to the telehealth model implemented in this evaluation. For instance, Herrington, Zardins, & Hamilton, (2013) described a pilot trial of emergency telehealth in Western Australia. The service was established in 2012, and linked 25 rural EDs, mainly staffed by nurses, to the Western Australian Country Health Service (WACHS). The rural services were able to access specialist emergency medicine advice. Fifteen emergency medical specialists were involved in the project which also employed Polycom technology. The nurses at the rural service did not manipulate the cameras – this was taken care of by the doctors. Although the project was not evaluated, Three thousand consultations occurred in the first 11 months and telehealth was found to be useful for clinicians in regard to managing patients locally.

Saurman, Lyle, Perkins, & Roberts, (2014) evaluated a program that provided emergency mental health care to rural and remote Western New South Wales, Australia. The program was entitled Mental Health Emergency Care - Rural Access Program (MHEC-RAP). In this model of care, a person requiring advice called a Mental Health Emergency Care (MHEC) helpline. They were usually offered advice and support. But, if more support was required, the call was transferred to emergency triage and the person either received care via the telephone and/or had a video assessment. A decision was then made around whether the person could be managed locally as an inpatient or outpatient, or transferred to a Mental Health Inpatient Unit (MHIU), which was usually out of their community. This service was available around the clock and the evaluation confirmed that the service was well established and achieved commendable levels of service activity.

Another example of the use of telehealth for emergency care was its use to provide care to older adults residing in Senior Living Communities (SLCs) in Rochester, New York (Shah, et al., 2013). If a patient was deemed appropriate for a telehealth consultation, a Certified Telemedicine Assistant (CTA) would be dispatched to the patient's residence by car. He/she would then follow a standard protocol to collect the relevant health information on the patient and send this information to a clinician (physician, providers of geriatric care or emergency medicine). The information would then be reviewed followed by treatment. The stakeholders in this study found that telehealth was fast and convenient in providing care during emergencies.

An example of telehealth used for emergency care, after-hours, was the transmission a series of scans of a patient, suffering from acute neurological issues (Waran, Bahuri, Narayana, Ganesan, & Kadir, 2012). The scans were sent as video using mobile phones and 3G multimedia messaging services. This supported a consultation between junior doctors in a neurosurgical unit and the consultant who was on call after-hours. This was found to be very beneficial in treating neurological emergencies.

The differences between the cases reported in the literature and this evaluation are as follows:

- **Telehealth in this evaluation was primarily being used to provide after-hours care. Therefore, it was not a service that was used round the clock**
- **Telehealth in this evaluation was being used to connect the nurse and patient to a Medical Officer, rather than a specialist**
- **Telehealth in this evaluation was not being used to treat patients suffering from a particular condition. The patients that had a consultation presented with a range of low acuity conditions**

This evaluation of the Hume Region Emergency Department Telehealth project was quite different to the projects reported in literature. Over the last five years (2010-2015), publications in this area of work were lacking. There was a clear gap in the literature which this study can now inform.

Having presented background on the project and literature, the following sections will focus on the evaluation beginning with an outline of the objectives, followed by the evaluation design, results, discussion, recommendations and conclusion.



Objectives of the Evaluation

The objectives of the evaluation conducted as part of this project were:

- **To evaluate the telehealth system performance in terms of accessibility, continuity of care, responsiveness, effectiveness, safety, efficiency and sustainability (AIHW, National Health Performance Framework)**
- **To describe the experiences of patients and clinicians in undertaking telehealth consultations in regional EDs and small rural hospital UCCs including, expectations, confidence and technical aspects. Clinicians included nurses, Junior Medical Officers (also known as junior doctors), senior doctors, and General Practitioners**
- **To describe the experience of and attitudes towards telehealth for after-hours care among the rural GPs in the participating UCC sites**
- **To describe the perception of higher management (Chief Executive Officers or Director of Clinical Services/Nursing) in regard to the sustainability of telehealth**
- **To describe the perception of administrative staff (clerical staff) in regard to arranging telehealth consultations in the after-hours**

The project was evaluated whilst still in a dynamic phase of development and subsequently the evaluation team needed to work flexibly with the project officer with the intent of answering the following study questions:

- **To what extent has telehealth impacted the patient's accessibility to care?**
- **To what extent has telehealth impacted the continuity of care?**
- **To what extent has telehealth influenced responsiveness of care?**
- **To what extent has telehealth impacted the effectiveness of care provided by the health professionals?**
- **To what extent has telehealth impacted the safety of care?**
- **Was telehealth considered a sustainable initiative when ongoing and projected costs are considered?**

Evaluation Design



The following section provides an outline of the methods used for data collection and analysis. It begins with an overview, followed by the outcome measures, and information on the participants and data collection methods.

Overview


In order to answer the study questions data was collected from several stakeholders including patients, clinicians (nurses, junior doctors, senior doctors, GPs), clerical staff and higher management (Chief Executive Officers and Directors of Clinical Services/Nursing). A mixed method approach consisting of focus groups, surveys, interviews and analysis of clinical data was used. Data collection occurred in two rounds as highlighted in **Figure 2** (pg 26). All participants had to be above the age of 18 and be competent in the English language.

As seen in **Figure 2** (pg 26) the first round of data collection commenced in February 2014. The first round of data collection was carried out at two sites, six and ten months after implementation of the service (results provided in Appendix L), and the second round was carried out the following year when all but one site had over six months of service. This allowed participants to gain enough experience in using telehealth, given the variation in start dated across the region. Patients were surveyed at several time points as described later in the section 'Participants and data collection' p 24. The timing of the data collection from the CEOs was based on allowing sufficient time from implementation of the service, and its use within the healthcare organization.

This evaluation made use of the relevant criteria of the Australian Institute of Health and Welfare, National Health Performance Framework (NHPF) (Australian Government, Australian Institute of Health and Welfare, 2009), to categorize the themes that emerged from the non clinical data. This would align this study to the Australian context and enabled some understanding of the impact of telehealth on the overall productivity of the healthcare system in Australia. This framework was used to systematically review 50 papers on the evaluation of telehealth implementations (Dattakumar, et al., 2013), and was found to be a useful way of categorizing and understanding the outcomes of telehealth.

'The main purpose of the NHPF is to provide a structure for reporting on the performance of the Australian health system at the national level. The framework can also be used as a guiding structure when developing sets of performance indicators for more discrete components of the health system, such as a particular program, or a specific target group.' (Australian Government, Australian Institute of Health and Welfare, 2015)

In order to provide a complete and thorough report on the evaluation, the structure of this report is adapted from the guidelines for evaluation of health informatics applications: Statement on reporting Evaluation Studies in Health Informatics (STARE-HI) guidelines (Talmon, et al., 2009). Approval to conduct the study was given by Northeast Health Wangaratta, Human Research Ethics Committee (NHW HREC) and registered with the University of Melbourne, Department of Rural Health Human Ethics Advisory Group (HEAG)



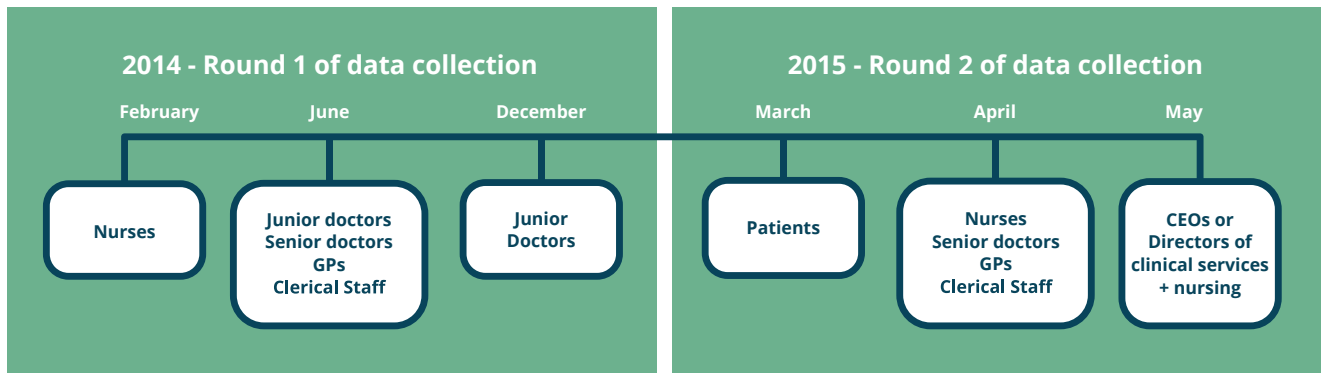


Figure 2: Phases of data collection for evaluation

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Outcome Measures

The criteria in the NHPF are outlined in **Table 1**, alongside the themes that emerged from the data. A deductive approach to data analysis was utilized. This analysis was relevant, as the framework was used in a different area of work in healthcare (Elo & Kyngas, 2008) and was being tested and adapted in a different context.

Table 1: Outcome measures based on National Health Performance Framework

Criteria	Description	Criteria linked to themes that emerged from data
AIHW Health Performance Indicators		
Questions around these three criteria were targeted towards all participant groups, except GPs		
Accessibility	People can obtain healthcare at the right place, at the right time, irrespective of income, physical location and cultural background	Impact of cultural group or age on access Community awareness of telehealth Wait time for telehealth consultation Money spent by patient on telehealth consultation Transfers by car or ambulance
Continuity of Care	Ability to receive uninterrupted coordinated care or service across programs, practitioners, organisations and levels over time	Technology capability Provision of care plan/paperwork before and after consultation Follow up with GP and communication/ letter sent to GP after consultation
Responsiveness	Healthcare service is patient oriented. The client is treated confidentially with dignity and respect and encouraged to participate in choices related to their care	Individuals treated with dignity and respect Patient's confidentiality and privacy maintained Patient's allowed to makes choices and decisions about the care they received
Questions around the effectiveness of care were targeted towards the Junior Medical Officers, nurses and senior doctors		
Effectiveness	Care/intervention/action provided is relevant to the client's needs and based on established standards. Care, intervention or action achieves desired outcomes	Presence of guidelines, education and training Stress related to using telehealth Confidence in using telehealth
Safety	The avoidance or reduction to acceptable limits of actual or potential harm for healthcare management or the environment in which healthcare is delivered.	Quality and safety data collected from the NHW ED telehealth database
Questions around efficiency and sustainability were targeted towards clerical staff, General Practitioners (GPs) and Chief Executive Officers or Directors of Clinical Services/Nursing		
Efficiency and Sustainability	Achieving desired results with most cost effective use of resources. Capacity of system to sustain workforce and infrastructure, to innovate and respond to emerging needs	Difference in time spent on after-hours calls by GPs Difference in administrative workload Potential to continue the service beyond 'project' phase

Participants and Data Collection Method

Information on the participants and the method of data collection for each group is presented in **Table 2**.

The data acquisition method differed across the various participant groups. Two criteria were used to choose a suitable method; the most convenient approach from the participant perspective and the most appropriate method to collect the type of data needed to answer evaluation questions particular to each participant group. As outlined in **Table 2**, several data acquisition methods were used to collect data from the patients, in order to get a higher response rate. **Table 3** outlines the patient response and participation rates as well as reasons for non-participation.

Patients

Several methodologies were employed to gather data directly from patients who used the afterhours telehealth service. The following section and the information in **Table 3** describes the strategy and demonstrates that despite four different approaches non participation rates were high. This is a common problem in health service research, with some authors postulating that satisfied patients are less likely to respond, as are patients who have had a short stay (John, 1992).

Point of care: Surveys designed specifically for the project (Appendix K) were distributed to each spoke site after face to face explanation and instruction to UCC nursing staff regarding the evaluation of the telehealth service and the importance of patient feedback. The nurses were asked to explain the evaluation to the patients, hand them an information sheet and invite them to participate by gaining their consent and then completing the survey after their telehealth encounter. The patients could either return the survey by posting in a returns box in the UCC or by placing in reply paid envelope and posting back. After some weeks of no response from this approach the UCC nursing staff informed the research team that patients were tired at the end of their consult and were not interested in completing any evaluations.

Take Home Survey (from Point of Care): A two page plain language statement was produced, to invite patient to participate in the study, explain the consent procedure and to explain the importance of their feedback. Nurses were requested to present each patient with a survey prior to discharge – a plain language statement, consent form, survey and reply paid envelope were provided for patients – which gave patients the opportunity to consider the survey in their own time.

Postal: The project team then decided to try a direct mail out to all patients who had used the telehealth service with reply paid postage envelopes for completed questionnaires. Surveys were posted out to all patients who had accessed the service at that time (n=102). There were only 8 completed returns and 3 returns to sender 'no longer at that address'.

Direct phone contact: The next and final strategy was to attempt to contact patients by telephone. As shown in Table 3, direct contact with 110 patients by telephone was attempted by the research team. Twenty three people completed the survey with the researcher.

Clinical data

A specially constructed database was used for this evaluation - NHW ED telehealth database. The ED clinical record data recorded key elements of the telehealth consultations including patient demographics, presenting problem, diagnosis, time and date, length of consultation, prescribing patterns, diagnostic tests, follow up management and outcomes. This data is incorporated into the results below and detail provided in Appendix B. It must be noted that the data identifying a telehealth consultation was not able to be recorded in the Victorian Emergency Minimum Dataset (VEMD). The VEMD 'includes de-identified demographic, administrative and clinical data detailing presentations at Victorian public hospitals with designated Emergency Departments' (Department of Health and Human Services, State Government of Victoria, 2015).

Table 2: Participants, data collection method and justification for choice of method

Participant type	Data collection method	Justification for data collection method
Patients	Face to face – offered explanation and invitation to complete survey at point of care Take home survey Mail out to all patients Phone surveys	Four methods in a bid to improve response rates Telephone surveys allowed the patient and interviewer to have a one on one conversation with each other, thereby capturing each unique patient story
Nurses at each participating SRHS	Focus groups Online survey	Nurses participated in a focus group in 2014 and were then surveyed in 2015. Focus groups were found to be a good way to encourage nurses to jointly discuss the benefits and challenges faced when using telehealth and provide potential items for the subsequent survey. An online survey was used for data collection in the second round to enable measurement of key factors
Junior Medical Officers or Junior Doctors in ED (NHW)	Online survey or face to face response to survey questions with interviewer	Either returned questionnaire to the research staff or were interviewed by the research staff that filled the questionnaire on their behalf. Two options for data collection was employed to improve response rate
Senior Doctors in ED	Online survey	Senior Doctors were requested to complete an online survey. This enabled them to complete the survey in their own time
General Practitioners based in each participating site	Telephone interviews	This was found to be the easiest and most convenient method of data collection for participants. Participants were easily contactable via this method as the practice manager would fix up an appointment time for the interview
Clerical Staff in ED (NHW)	Online survey	This was found to be the most convenient method for this group of participants as they could fill the survey in their own time
Chief Executive Officers (CEOs) or Directors of Clinical Services/Nursing at each participating site including NHW	Telephone interviews	Interview times were arranged through the executive PAs to maximize the chance of gaining opinion from both the hub ED and all partner UCC sites

Table 3: Patient experience of telehealth - Data Collection participation and response

Patient Response	Participation/non participation
Overall rate: 31% 34/110	
23	Completed phone survey
8	Completed postal survey
3	Returned survey from point of care
Reasons for non -participation in telephone follow-up: n=76	
23	No phone details recorded on medical record
3	Phone number disconnected
1	Patient death therefore excluded
4	Contact made but patient had no recollection of TH consult
1	Did not wish to participate in survey
1	Unable to complete as needed interpreter
4	Left message to call back but pt did not
40	No answer (2 attempts made at different times)
1	Same patient used TH twice, surveyed once
Total: 76	

Results



The following section provides an overview of the results. For complete data information, please refer to Appendices C to J.

The data for each group will be discussed using the NHPF criteria (presented in Table 1). Please note that when the term 'doctors' is used, it is with reference to both junior and senior doctors, unless otherwise specified. Both junior and senior doctors were based in the ED at NHW. GPs are noted as such.

The answer to each study question is provided at the end of each section.



Participant Type and Location

Table 4 below outlines the number of participants that were surveyed or interviewed in each group along with other relevant information.

Table 4: Data on participant type, number of times telehealth was used and participants' location

Participant Type	Number of Participants	Number of times telehealth was used	Locality of participants
Clinicians			
Nurses	14 focus group participants *73 survey participants, 28 complete responses	1 to 5 times	Yarrawonga & Corryong (focus groups). All other sites included in online survey
Junior Medical Officers	8	1 to 5 times	Wangaratta
Senior Doctors	4	1 to 5 times	Wangaratta
General Practitioners (GPs)	9	NA	Yarrawonga
TOTAL number of clinicians	49		
Other Participants			
Patients	34	Once	All sites
Clerical Staff	6	NA	Wangaratta
CEOs or Directors of Clinical Services/ Nursing	8	NA	All sites
TOTAL of other participants	48		
TOTAL number of participants in study: 98			

* It is important to note that 73 responses were received for the nurses' survey. Of these, 14 participants had not used telehealth and could therefore not complete the survey. Of those fourteen, twelve had not been on duty when a suitable patient presented after-hours. One participant stated that a patient was suitable but refused telehealth. One participant had not undertaken training on how to use telehealth. 31 participants opened the survey but did not consent and complete or consented but did not complete.

Accessibility

Accessibility referred to being able to access the care required at the right place at the right time irrespective of cultural background, income and other personal characteristics.

The NHW ED telehealth data (see Appendix B for detailed results) showed that between April 2013 and 31st May, 2015, 276 patients were referred for a telehealth consultation. The highest number of referrals were from Benalla (79), Corryong (74) and Yarrawonga (73). Sixty-eight percent of presentations were category 4. The average age of patients was 42 years (SD 27 yrs), median 39 yrs. Telehealth prevented 144 patients from travelling beyond their local hospital after-hours.

Impact of cultural group or age on access to care

Junior doctors, senior doctors and nurses felt that patients belonging to a particular cultural group, such as someone of an Aboriginal or Torres Strait Islander descent or non-English speaking background, did not affect their access to ED telehealth. One patient, [P30] who identified as a person of Aboriginal or Torres Strait Islander descent, was very happy with the service provided. This respondent stated that cultural background had no influence on access to the ED telehealth service. Importantly this respondent suffered from a serious chronic disease and paying fees for GP services in the afterhours periods was an important barrier to accessing care.

"...usually costs \$90 to call the doctor in. Very happy that this was free as I am a single mother on low income and there is no bulk billing in Benalla." [Patient, P23]

Age was an issue for some respondents:

"Yes. As a general rule, I am not happy to treat people at the extremes of age (i.e. babies and the elderly) over telehealth as the implications of a wrong diagnosis are severe. I also have less confidence in making decisions for babies/children unless I can personally perform physical examinations on them as the value of history taking in this group is very limited." [Junior doctor, P5]

"Two elderly patients I have used the system with, could not understand that there is a person on the TV speaking to them." [Nurse, P28]

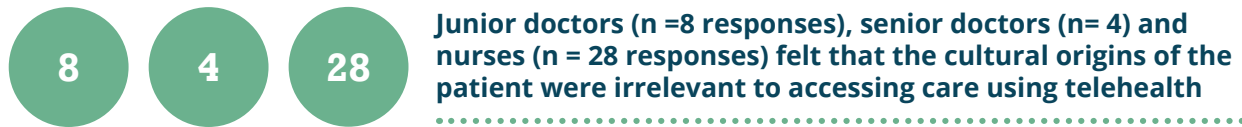
"Mother's opinion on effectiveness and confidence with telehealth would be more positive if the consultation had been for her and not for her 2 y/o as a child is unable to explain and describe symptoms compared with an adult." [Patient, P28]

These reports may imply that there may be some issues with using telehealth to treat infants and the elderly, one reason being the inability to examine them and the other being difficulty or inability (as was the case with an infant) to understand the technology and how it worked. However, the nurses who participated in the Corryong focus group stated that mothers of young children were very happy with the service and older patients found that it was quite unique, and they were able to establish better rapport with the doctor as they were able to see them and talk to them. One junior doctor had a similar comment:

"I think the system as it is now works very well. This is a very valuable addition to the rural health service. The ability to see patient is a valuable addition to my decision making process..." [Junior doctor, P5]

The nurses who participated in the early Yarrawonga focus group said most patients were happy to use telehealth when a doctor was unable to see them- this finding was consistent when assessed via the online survey one year later.

Data at a glance



6 out of 8 junior doctors felt that age may be an impediment (difficult to treat elderly and infants as more risk involved if complications occurred)

6/8

Community awareness of telehealth

Nurses and patients were asked whether the community was aware of telehealth. Just under half of the nurses indicated that they felt the community was unaware of the telehealth service. However most of the nurse respondents (82%) felt that people in the community would be willing to use the service. The nurses from Yarrawonga who participated in the early focus group felt that only few in the Yarrawonga community were aware of the existence of telehealth. The service had been reported in the local newspaper. Some community members found out through word of mouth or from ambulance officers, after refusing to be transported by ambulance to NHW (due to issues such as distance from home, and lack of transport back home). The ambulance officers informed the patient of the telehealth service at the local hospital as an alternative to seeking medical care after-hours elsewhere. The nurses' focus groups were run at the early stages of the project and the nurses' survey data collected one year later did not indicate any improvement in community awareness of telehealth.

Many patients who accessed telehealth reported that they had heard of telehealth prior to coming to the UCC (27/34) but were not aware if the broader community knew of the service (18/34). Two patients out of the 34 chose to provide comments on this issue:

"[Community] doesn't like it though as it's too impersonal." [P16, patient from Corryong]

"Yes, especially those with ageing issues." [P18, patient from Corryong]

Both patients who gave a comment on this question were based in Corryong but had differing points of view. Perhaps the elderly were aware of telehealth due to their frequent need for urgent medical care, and were not perturbed by the "impersonal" aspect of telehealth, in comparison to the rest of the community who may have perceived that telehealth would be "impersonal" when compared to face to face care. This perception may be related to the lack of experience with the service.

Without a wider cross sectional community survey at all participating sites it is not possible for this evaluation to accurately determine how widespread the community awareness truly is.

Wait time for telehealth consultation

As seen in **Figure 3**, nurses, patients and clerical staff were asked about waiting times. Wait times were between the overall time between arrival and telehealth consultation. The nurses and patients were in agreement that the wait time was anywhere between half an hour and three hours, between arrival and teleconsultation. However, the clerical staff stated that it could take anywhere between half an hour and more than two hours from when they received the referral and time the consultation took place.

This discrepancy in data could be explained by the fewer number of clerical staff that completed the survey (6 in comparison to 28 nurses and 34 patients) or given that this question asked

participants opinion the variation may be due to bias. When the ED telehealth data base was checked the average wait time was 46 minutes (Median 35 min) between referral and the consultation (in agreement with the perception of nurses and clerical staff). Wait times for Triage Category 4 patients was chosen as the best measure of comparability. Category 4 referrals constituted 69.6% of ED telehealth referrals and 50% of combined NHW ED presentations in 2013 / 2014 & 2014/2015. Wait times for telehealth patients were shown to be closely comparable with actual face to face ED wait times during the 2013 / 2014 period. In the following time period, 2014 / 2015, there was a notable reduction in waiting time at the NHW ED (average 31 min; median 16 min) whilst telehealth waiting time remained consistent with 2013 / 2014 data (average 48.6 min; median 35 min). See table 4 Appendix B.

Data at a glance

27/34

27 out of 34 patients were aware of telehealth. 18/34 unaware if service known to community

12 out of 28 nurses felt that community was unaware of telehealth service

12/28



It was unclear from the data as to whether there is awareness across the broader community

Some patients felt that the wait time for a telehealth consultation was shorter than their previous experiences of wait time to see an ED doctor face to face



Most patients felt they were given an accurate estimate of wait time

Many participants would have chosen to drive on their own or with a relative to another health service if telehealth was unavailable



46

The average wait time for all telehealth referrals, as recorded in the NHW ED telehealth data, was 46 minutes between referral and consultation. In 2014/2015, telehealth patients did wait approximately 17 minutes longer for a consultation, on average, than those presenting at the ED

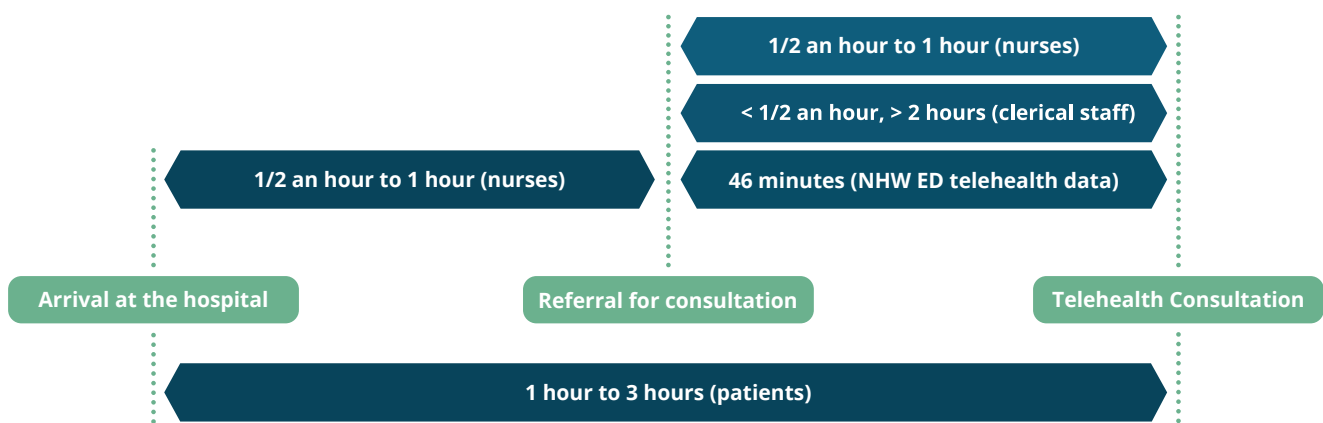


Figure 3: Wait time between arrival in hospital, referral and telehealth consultation

Patients were asked if they were provided with an accurate estimate of the wait time. The majority of participants (53%) stated that this was provided. (NB. It is important to note that waiting times were just an estimate, and UCC nurses were educated to instruct patients that they were part of the NHW ED real time 'queue' and given the nature of emergency departments, the arrival of more urgent cases at NHW could mean wait time estimates may change).

Thirty-eight percent of participants felt that the wait time was shorter than their prior experience of the time taken to see a doctor face to face in an Emergency Department. Forty-four percent of patients indicated that without telehealth they would have otherwise chosen to drive on their own or with relative to another hospital for care.

More than half of the patients (58%) stated that the outcome of the telehealth consultation was similar or better than a face to face consultation with an ED doctor, 21 % felt it was worse and the remainder were unsure or unable to say (see Appendix J, p 124 for detailed patient comments).

Money spent by patient on telehealth consultation

Urgent Care Centers in the state of Victoria are not funded for emergency care therefore if a GP is called for a consultation the patient is charged a fee by that GP. Patients were asked about the amount of money they spent on the telehealth consultation. No patient paid a fee for the telehealth consultation.

Transfers by car or ambulance

Nurses and senior doctors were asked how important telehealth was in reducing ambulance and private car transfers. The majority of nurses (23/28) felt that telehealth was important in reducing these transfers. All the senior doctors that completed the survey (4 in total) felt that telehealth played an important role in reducing these transfers. Some of the comments made by the nurses (no senior doctors provided any comments), are provided below:

“Important - Patients who are elderly and not keen to go to a regional hospital and want to stay in their own community with the support of their family and friends.” [Nurse, Beechworth, P3]

“Unsure about ambulance transfers/very important for private car transfers- Most issues are around ambulance cover as our UCC is not funded and the cost of the ambulance is borne by the client unless they have either private health or Centrelink pensions. In this case some people prefer to discharge themselves and be taken in a private car. Some people come to the UCC instead of calling an ambulance due to having no ambulance cover.” [Nurse, Alexandra, P4]

The nurses felt that the telehealth service may have a positive impact on reducing both ambulance transfers and private car transfers. This may be helpful to regional hospitals due to reduced workload (organizational issue), patients as they may not want to be transferred (personal issue), and ambulance costs are saved (monetary issues), while importantly ambulances are not out of the area when a more urgent case may need them.

The nurses based in Corryong who participated in the focus group, stated that patients had the option of travelling to Wodonga for further advice/treatments, but when a patient was injured, the time lost in travelling as well as waiting times, could be of great concern. The type of transportation (a utility vehicle for instance), used for this commuting as well as the time (night travel can be more dangerous e.g., black ice on roads in Alpine area) were expressed as primary concerns by the nurses. In addition to these issues, accommodation, meals and ambulance services (if required), could be additional costs for the patients. Telehealth could be a good alternative in these circumstances.

Overall, the senior doctors and nurses feel that telehealth played an important role in reducing transfers and the ED telehealth database confirmed this. Furthermore telehealth facilitated a timely medical review and first line treatment in 55 cases that subsequently needed transfer to a larger centre.

Data at a glance



No patient had to pay a fee for a telehealth consultation

44% patients indicated they would spend more money seeking care at another health service, if telehealth was not available.



Both senior doctors and UCC nurses felt that telehealth was important in reducing ambulance use

The NHW ED telehealth data (Appendix B) highlighted that 55 (20%) patients had a medical review and/or earlier treatment before being transferred to another health service



53% of patients were sent home after a telehealth consultation; 20% of patients were transferred to the nearest regional ED; 8.9% failed to wait

Answer to study question:

To what extent had telehealth impacted accessibility to care?

All participants acknowledged that telehealth had improved access to care. It provided an alternative way for patients to “see” a doctor, during the after-hours. The wait times were perceived by the majority of patients as being shorter in comparison to their experience of previous face to face consultations at an ED. Telehealth was perceived by all participants as important in reducing car and ambulance transfers, especially in the night when it may be unsafe to drive to a regional centre. Being part of a particular cultural group had no impact on a patient’s access to care via telehealth, however extremes of age may.

Continuity of Care

Continuity of care referred to the ability to receive uninterrupted care across organisations (in this case) over time. Therefore, the technology should work well, the documents regarding the patient’s condition and treatment should be received and sent on time, patients should be advised to follow up with their GP if needed, and a letter sent to the GP outlining the details of the telehealth consultation.

Technology capability

The doctors, nurses and patients were asked to comment on the connectivity, sound and visual aspects of the telehealth service.

The majority of participants, across the groups, either agreed or strongly agreed that the connection was good, vision and sound were consistently good. Participants were asked to comment on this, and the comments highlighted, that occasionally, the technology did not work well:

The positive side:

“Simple to use, convenient tool and suitable for patients who are well and needed some form of advice.” [Junior doctor, P3, used telehealth 3 times]

“Strongly agree - ECGs were examined via the video conferencing screen by the doctor as the ECG was held up to the screen”. [Patient, Yarrawonga, used telehealth once, P17]”

“Agree - needed different headset, then was great”. [Patient, Benalla, used telehealth twice, P30]

What could be improved?

“You could make improvements. Some of the other facilities I worked at had multiple screens that is observation screens, also could see patients from multiple angles. We can’t see any electronic results we just have what is faxed through.” [Junior doctor, P8, used telehealth 5 times]

“Had one occasion when the doctor in Wangaratta could not zoom in on the child’s rash / couldn’t work out how to do this [whether Wangaratta had a problem or it was Myrtleford who had to make an adjustment. So the doctor found it difficult to assess the rash.” [Nurse, P20, used telehealth 4 times]

“Strongly Disagree - didn’t work at all. Doctor had to give advice to nurse by telephone”. [Patient, Yarrawonga, P8, used telehealth once]

Based on the comments, it can be said that all participants needed to gain more experience through frequent use of the technology. In regard to the patients, 30 patients had only used telehealth once. So, if the technology worked well on the day, their comments and rating would be positive. The technology had worked well on most occasions. In regard to the junior doctors and nurses both groups had used telehealth between 6 to 10 times for a consultation. So, their experience with the technology was relatively new at the time of this study.

The following quantitative data summarise the technology capability from the perspective of the patients and clinical staff. See Appendices C-F and J for comprehensive details.

Data at a glance

80%

80% patients reported seeing the doctor clearly, and 85% patients reported hearing the doctor clearly

63 % nurses stated that the connection quality was consistently good, and 68% nurses stated that the vision and sound were consistently good

63%

68%

63%

63 % junior doctors stated that connecting for a consultation was straightforward most of the time, and 63 % doctors stated that the clarity of vision and audio was very good

75% senior doctors strongly agreed that the connection quality was good. 50% agreed that the vision was consistently good, and all agreed that the sound was consistently good

75%

50%

Provision of care plan/paperwork before and after consultation

The doctors, nurses and clerical staff were asked whether the Identify, Situation, Background, Assessment and Recommendation (ISBAR) referral and medical consultation notes were sent in a timely manner before and after the consultation. This was important for providing efficient, high quality care to the patient and for satisfying a requirement that both sites managing the patient's care had a patient record containing the respective original and copied versions of documents. Most participants, across the groups stated that the paperwork was always or mostly sent on time. The process of sending the paperwork is highlighted in **Figure 4** below:

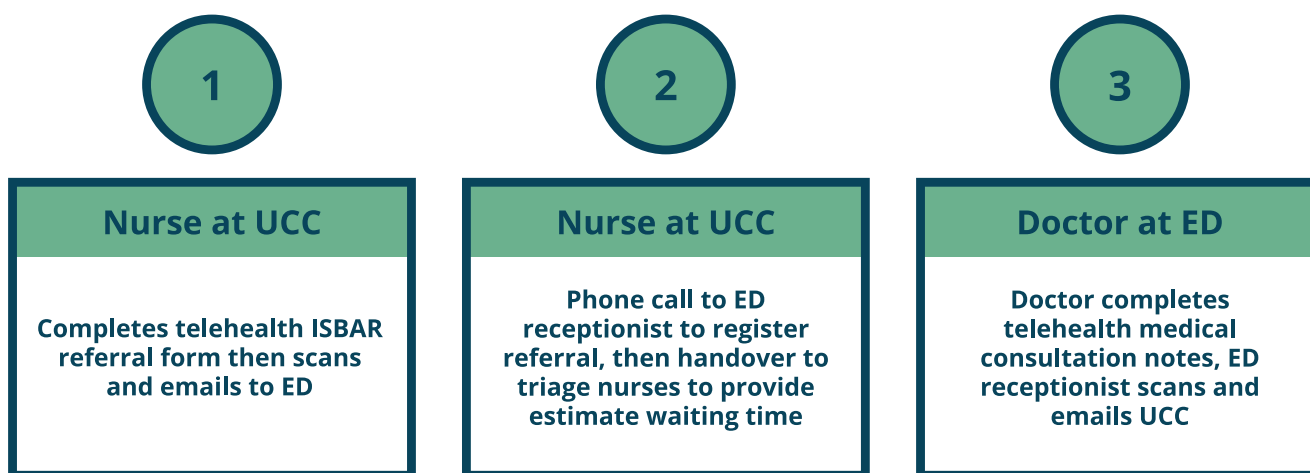


Figure 4: Process of sending paperwork for telehealth consultation

Once the paperwork was sent to the ED by the nurses at the UCC, he/she called the ED, at which time the details were communicated to reception, triage nurse and then the doctor during the consultation. The doctor, immediately following the consultation, completed the telehealth medical consultation notes gave this to the ED receptionist who scanned and emailed it to the UCC. The survey data indicated that there seemed to be an issue with the way information was sent between the sites. Multiple modes of communication were used – email, fax and phone. It is not clear from the data if this problem is widespread and persisting, however, if it is it could lead to miscommunication, missing records, or duplication of records, all of which could be problematic. The nurses and doctors commented on this process stating that it was repetitive and time consuming:

“Communicating the same information to the clerical assistant, then to the triage person, then communicating to the doctor seems very repetitive at times. I must say e-mailing the information is time consuming & frustrating at times- much easier to fax & talk on the phone. I always ring after I have sent the information to make sure that it is received. I ring to say that we have received the wrong person's details - say someone from Corrowa or Yarrawonga instead of Corryong, we all have to be very diligent in reviewing the correct information in a timely manner...” [Nurse, Corryong, P2]

“The Nursing or admin staff who answers the phone are often unfamiliar with the telehealth process, so take a long time to sort out what they are doing. It seems a very long wait time to have a consultation with the patient; the clients often don't wait and leave to get themselves to Wodonga to be seen quicker. They think if they are the only persons in UCC they should get seen quicker. Initiation of treatment takes a long time from a medical perspective; we could give a dose of Maxalon for example before they

have the consultation. We have to wait a long time for those sorts of orders. Pain relief, antiemetics, salbutamol could be given straight away but instead we have to wait until the Doctor rings us back with an order which could take 2-3 hours. The patients are getting impatient because it looks like we are not 'doing anything' to help them." [Nurse, Corryong, P27]

"Disagree - feel that I am lacking a lot of information to complete paperwork. I feel like I'm missing case information, patient information and some of the story. This is both a problem with the information sent and with the examination/consultation." [Junior doctor, P8]

However, despite the perceived repetition of information being communicated in the referral process (different information actually required at different stages of the referral and consultation), the nurses responding to the online survey stated that the follow-up medical consultation paperwork was either, always or mostly sent in a timely manner. This showed that there was improvement in this process since the earlier focus group findings, when the nurses had concerns that doctors were taking too long to send the written medication orders or other documents (at times up to 24 to 48 hours). It is important to note that the ED telehealth process was changed in late 2013 to ensure the service was fully integrated into the ED workflow, and that documentation was sent to UCC immediately following the consultation.

The following quantitative data summarises the provision of information, paperwork from the perspective of the clinical staff. See Appendices C-F for comprehensive details.

Data at a glance

75% junior doctors strongly agreed that clinical documentation was received on time and paperwork was completed in a timely manner

93% nurses felt that the paperwork was sent to them on time upon completion of the consultation

93%

50% 50 % clerical staff felt that the paperwork was given to them in a timely manner by the ED doctor

Patient information was communicated by the UCCs to the ED, using email, fax (occasionally if email not working) and phone. This was perceived as repetitious by UCC and clerical staff and could potentially present a risk for inaccurate, missing, or duplicate records. No suggestions were made as to a better system for information transfer

←

Follow up with GP or other clinician and letter sent to GP after consultation

The ED doctors, UCC nurses and patients were asked whether there was a follow-up with their General Practitioner planned after the telehealth consultation. The GPs were also asked if they regularly saw patients after they had used the telehealth service. The responses to this question were inconsistent.

While the ED doctors indicated that they recommended a follow-up appointment with the GP (7/8 junior doctors and ¾ senior doctors), the nurses were less likely to say this occurred (12/28), however 23/34 patients stated that they did follow up with their GP after a consultation:

“Yes - I decided myself to go to the GP because I wanted ongoing care for my leg and I felt that the telehealth doctor had made it clear that I needed to be seen in Wangaratta. My GP then arranged for me to go to Wangaratta.” [Patient, Corryong, P10]

“Yes - saw GP next am 8:30. GP admitted patient to hospital immediately. IV fluids given over 2 days.” [Patient, Benalla, P33]

“No - just needed analgesia. The issue is long term and didn't need follow up.” [Patient, Corryong, P20]

When doctors advised the patient of a follow up with the GP it appeared that many patients were acting upon this advice, however when the GPs were asked about their awareness of their patients use of afterhours telehealth 5/9 GPs had no knowledge of this. This is an area that warrants further research.

The doctors, nurses and clerical staff were asked whether they sent a letter to the GP following the consultation. It appears that at the time of this evaluation this rarely occurs - 19/28 nurses, 6/8 junior doctors, 3 / 4 senior doctors, and 6/6 clerical staff stated that they were not sure or that they have never done this. The data from the GPs highlighted that many (5/9) were not aware of how many of their patients had a telehealth consultation. There was no protocol around this aspect when the data was collected for this study. The usual practice is for the ED doctors to inform the GPs of any ED consultations via a discharge letter however it seems that this may not be occurring consistently for the telehealth patients.

Data at a glance



Most junior and senior doctors recommended a follow up with the GP however they did not routinely send a letter to the GP regarding the teleconsultation

Many patients who responded to the question indicated that they followed up with the GP after a teleconsultation



Nurses indicated that they sometimes recommended a follow up with the GP but were not sure if a letter was sent to the GP

The majority of GPs were not aware if their patients had used telehealth



To summarise, there were some minor issues with the administrative process –there were perceptions of some repetition in the transfer of information required to set up a telehealth consultation, and the patients usual GP did not appear to be part of the communication loop post an afterhours telehealth consultation.

Answer to study question:

To what extent had telehealth impacted continuity of care?

Telehealth supported continuity of care. In regard to the technology, the sound and visual aspects were found to be good, with the exception of occasional minor glitches. In regard to administrative procedures, paperwork was received and sent in a timely manner, prior to and after the consultation. Some nurses however reported the paperwork referral process to be time consuming and repetitive - greater familiarity with the system over time seemed to reduce these perceptions. Patients were advised by the telehealth doctors when required, to make a follow-up visit their GP. However, GPs reported that this did not occur and they did not receive letters informing them about their patient's after-hours telehealth consultation. While GPs in the longest running Telehealth site were very aware of the afterhours service and highly supportive of it, GPs in some other sites reported little knowledge of the service and did not feel they or their health service would make use of it.

Responsiveness



For effective care all participants in the telehealth process - patients, clinicians and clerical staff should feel as though they are treated with dignity and respect when communicating with each other. Patient privacy and confidentiality also needed to be maintained and valued in the same manner as a face to face consultation decisions and choices about the care they receive should not be compromised by telehealth.

Individuals treated with dignity and respect

The doctors, nurses, and patients were asked whether the patients were treated with dignity and respect. Nurses, senior doctors and clerical staff were also asked whether they felt that they as staff members were treated with dignity and respect by the rest of the telehealth clinical team.

The majority of participants, across all groups, felt that the patient was treated with dignity and respect (on a 10 point Visual Analogue Scale, with 0 being no respect and dignity and 10 being treated with complete respect and dignity), the average rating for this was 8. See Appendices C-F, H & J for comprehensive details.

There were some interesting comments in regard to this however:

"VAS score 10 - "there were 2 children with croup and doctor saw both at same time but started with her child, so both families were next to each other on trolleys without curtaining in between". Mother stated "this was ok as both kids had croup". [Patient, Yarrawonga, P14]


"VAS score 5 - "because I don't know what the nurses are doing to preserve privacy. I cannot be sure what is happening there. I am in control face to face, I tell the patient how much to undress etc." [Junior doctor, P5]

These comments are important and have been subsequently been addressed in the junior doctor training video where the doctors are coached to tell the patients about how they are controlling privacy at their end in the regional ED and to check in with the patient that they feel private and secure at their end.

The senior and junior doctors, nurses and clerical staff were asked whether they were treated with dignity and respect by the others in the telehealth team. The rating provided by both groups was between 8 - 9. However the following comment highlights that the nurses and senior doctors need to be diligent about this:

"I have had great experiences with telehealth however not all staff have. Staff at the telehealth hospital need to be aware that we are a small hospital and nursing staff are working alone and independently. We don't have back up- telehealth is our back up so support, stupid questions, advice and friendliness should be encouraged and supported. We all need to work as a team. I am aware that on busy nights a telehealth referral is difficult but it's hard to manage patients in a hospital without a doctor, or second opinion. We make a lot of difficult decisions and telehealth is a great way to help support us in this." [Nurse, Corryong, P6]

Based on the comment, one nurse had expressed some concern over the attitude of the telehealth team when it came to providing support to the smaller hospitals. But, as he/she acknowledged, time pressures and workloads could lead to rushed responses.



Patient's confidentiality and privacy maintained

The senior and junior doctors, nurses and patients were asked whether the patient's privacy and confidentiality were maintained during the consultation. See Appendices C-F, H & J for comprehensive details.

The majority of participants in each group rated this between 8 and 10 (on a 10 point Visual Analogue Scale, with 0 being privacy and confidentiality not maintained and 10 being very well maintained). Comments included:

"5 – I don't know how secure the physical environment is on the other side. Example, my patient was in a day stay ward and they may have had to speak a bit louder. I don't know how many other patients were there. I think telehealth consultations ideally should be in a private space. I think it would help if when you introduce yourself as a telehealth doctor, you ask the patient if they have enough privacy." [Junior doctor, P7]

"5-6. No difference to normal. EDs are never ideal." [Junior doctor, P8]

"10-Did not feel uncomfortable at all during the proceedings". [Patient, Corryong, P18]

"Yes at first [I was concerned], but the doctor handled it very well. I was completely comfortable because she said she would immediately turn off the camera if there was any noise or suggestion that someone was coming into the room". [Patient, Benalla, P30]

Based on the comments, one doctor was concerned about privacy on the other end, while another one stated that there was no difference between a telehealth consultation and an ED consultation as privacy was an issue in both situations. In comparison, the patients were not perturbed by this issue.

Data at a glance

8

On a VAS scale of 0 (no dignity and respect) to 10 (treated with utmost dignity and respect), the average rating for patients was 8

On a VAS scale of 0 (treated with no dignity and respect by the clinical team) to 10 (treated with utmost dignity and respect by the clinical team), the average rating for senior doctors was 8.9. Nurses provided an average rating of 9.3 and clerical staff 9.4

8.9

9.3

9.4



Overall, the participants felt that they were treated with dignity and respect

Patient's allowed to makes choices and decisions about the care they received

The doctors, nurses and patients were asked whether the patients' were able to make choices and decisions about the care they received on a 10 point Visual Analogue Scale, with 0 being no choice and 10 fully able to make choices. See Appendices C-F, H & J for comprehensive details.

The majority of participants in each group rated this between 8 and 10. Comments included: "2-3 – not much difference but in face to face probably a bit better. So much of the decision making is between the telehealth doctor and referral nurse. [Junior doctor, P8]

"10 – patient knew what he needed already". [Patient, P16]

"0 – strongly believed GP should be called". [Patient, P33]

Most participants felt that they could make choices and decisions about their care, with some exceptions as seen in the comments. The junior doctors felt that much of the decision making was between the nurse and doctor, but this could be due to the fact that the patient was being treated at a distance and more instructions needed to be passed on to the nurses. One patient's carer believed that the GP should have been called, but the decision was not taken. The patient who made that comment was taken by the carer the following day to the GP who admitted the patient to hospital for further treatment.

Answer to study question:

To what extent had telehealth impacted the responsiveness of care?

Patients and clinicians expressed positive opinions in regard to responsiveness. Patients, clinicians (junior doctors, senior doctors, nurses) and clerical staff were treated with dignity and respect. The patient's confidentiality and privacy was maintained and they felt that they were able to make decision and choices about the care they received. There appeared to be no difference between a telehealth consultation and face to face consultation in this regard.

Effectiveness

Effectiveness is about taking the appropriate actions in line with established standards and guidelines. Using telehealth should not compromise outcomes for patients. Effectiveness was measured by the presence of guidelines and training in telehealth, confidence levels of clinicians in regard to using telehealth for clinical assessment and decision making, and confidence within the telehealth team.

Presence of guidelines for telehealth consultations

The doctors and nurses were asked whether there were guidelines on setting up the telehealth consultation, choosing suitable patients for the telehealth consultation and completing the paperwork required for telehealth. The junior doctors were divided on this; 4/8 of them thought there were guidelines and 4/8 stated that there were none. In regard to the nurses, 15/28, 18/28 and 16/28 nurses agreed that there were guidelines for each of the aspects mentioned above.

Data at a glance

8

On a VAS of 0 (privacy and confidentiality not maintained) to 10 (well maintained), the average rating for patients was 8

The average rating for junior doctors was 8.8 in regard to maintaining patients' confidentiality and privacy during the consultation

8.8

8.7

The average rating for senior doctors was 8.7. The average rating for nurses was also 8.7

Overall, the participants felt that the patients' privacy and confidentiality was protected during the telehealth consultation

7.3

On a scale of 0 (not able to make choices) to 10 (fully able to make choices), the average rating for patients was 7.3

The average rating for junior doctors was 8 in regard to patient's being able to make decision and choices about the care they received

8

8.7

8.3

The average rating was 8.7 for senior doctors. The average rating for nurses was 8.3

Overall, participants felt that patients were able to make choices and decisions about the care they received

Three out of the four senior doctors believed that there were guidelines for setting up a consultation, choosing suitable patients and completion of paperwork.

Comments from junior doctors included:

“Not sure about guidelines for consultations- knowing the nurses on the other end of the telehealth helps as they have the confidence to tell me their clinical opinion. It takes a couple of attempts before you really get a handle on the limitations and how best to approach a telehealth consult. Starting with proper introductions including people not seen on the camera, getting the story from the nurse, taking the history and then asking the nurse what she wants. The last bit is very important as sometimes they are calling with a patient they already feel they do not have the capacity to manage or someone they are very comfortable with and just need a drug order. Understanding what the nurse and patient want out of the telehealth consult helps reach an appropriate outcome.” [Junior doctor, P2]

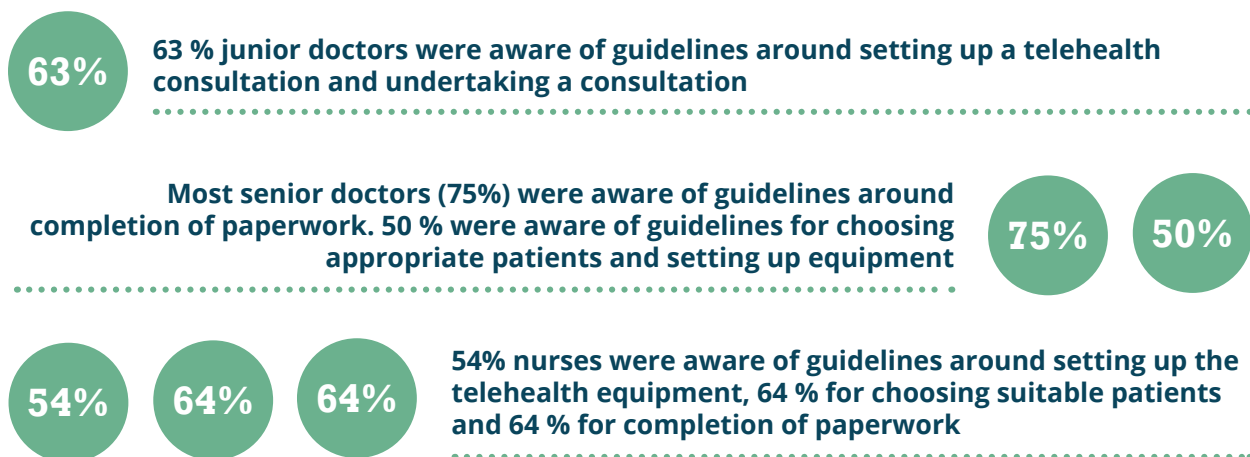
Based on the comment by the junior doctor, guidelines may be helpful, but each case was different. The doctor needed to assess the case, understand whether the nurse already knew the patient and his/her history and then determine the relevant treatment to be provided. This doctor highlighted one very important aspect of the telehealth encounter that being a clear communication process with the UCC nurse.

The senior doctor, acknowledged the presence of guidelines, however one participant made the following comment:

“I’m a senior; I don’t tend to use guidelines”. [Senior doctor, P1]

This may be problematic, as the senior doctors were responsible for training the junior doctors. If the senior doctors did not use guidelines, they may not encourage the junior doctors to do so. All the nurses agreed that there were guidelines. See Appendices C-F for comprehensive details.

Data at a glance



Education and training to use telehealth

Junior doctors and nurses were asked whether they were provided with education and training on using telehealth (See Appendices C,E, F for comprehensive details). Three of the eight junior doctors stated that they had received training and 25 of the 28 nurses had received training. It must be noted that since the data for the junior doctors was analysed in December 2014, the project team has implemented training in the form of a telehealth video for the junior doctors. The nurses commented that further education and training could be provided:

"As I have used the telehealth system infrequently an update/refresher session would be very useful. I think it is an excellent concept for our region." [Nurse, from Yarrawonga, P7, has had training]

"What to do about possible problems with use of telehealth." [Nurse, from Corryong, P23, has had training]

This feedback highlights the importance of ongoing education and training for ED telehealth, as there is infrequent use by some staff, due to low numbers of UCC presentations. Integration of education and training at individual sites is of high importance as is introducing telehealth in undergraduate clinical training especially for students in rural health programs. Normalizing clinical care using telehealth in undergraduate programs would assist in telehealth becoming part of usual business. While a regional approach has been taken on some aspects of telehealth training e.g. ED triage training, it is of critical importance to the sustainability of the service for each site to embed education and training to staff. On line provision of telehealth education potentially through the Victorian Regional Health Services eLearning Network (ReHSeN) is one possible solution. Only three out of eight junior doctors had received training and education around the use of telehealth at the time of evaluation however a specially produced training video is now available on line targeting junior doctors at NHW ED. 89 % of nurses reported that they had received training and education around the use of telehealth.

Stress related to using telehealth

The doctors, nurses and clerical staff were asked whether they feel stressed in regard to using telehealth. As discussed by LeBlanc, (2009), stress, in relation to clinical performance, was a subjective matter, but it could lead to suboptimal decisions in crisis situations. See Appendices C-F, H for comprehensive details.

The majority of participants across all the groups (5/8 junior doctors, 4/4 senior doctors, and 17/28 nurses and 6/6 clerical staff) had not felt stressed when using telehealth. One junior doctor however who did feel stressed stated the following:

"Yeah quite stressed as you are putting your name on the paperwork. You have very limited information coming to you - this makes it a lot harder." [Junior doctor, P7]

But, this stress could also exist in any ED situation. Bragard, Dupuis, & Fleet, (2014), reported that ED physicians suffered from moderate to high levels of burnout, which took a toll on them mentally and physically. Junior doctors had also felt unacceptably high levels of stress (Ochsmann, Lang, Drexler, & Schmid, 2011). Therefore, the stress may not be higher as a result of using telehealth, but be indicative of emergency department stress in general.

Forty percent of nurses indicated that felt some additional stress using telehealth however it was not clear if this was related to setting up the equipment, choosing the appropriate patients or providing clinical care. More research is needed to determine this.

Clerical staff was also asked if any stress was caused as a result of aggressive behavior (either verbal or physical) from patients or staff using the after-hours telehealth system. All participants stated that they had not faced such behavior from either patients or staff, and therefore, felt no stress in relation to this aspect. This could be considered a positive outcome, as anger manifestation and violent outbursts occur in EDs on a daily basis, putting patients and caregivers at risk (Arik, Anat, & Arie, 2012).

Data at a glance

3/8

Only 3 out of 8 junior doctors had received training and education around the use of telehealth at the time of evaluation however a specially produced training video is now available on line targeting junior doctors at NHW ED

89% nurses reported that they had received training and education around the use of telehealth

89%

5/8

5 out of 8 junior doctors had not felt stressed when using telehealth

All senior doctors reported no additional stress in relation to telehealth

40%

40 % nurses felt stressed when using telehealth

All clerical staff felt no stress, especially in regard to aggressive behaviour from patients and staff using the after-hours telehealth system



Confidence in using telehealth

The level of confidence of the doctors and nurses was measured using a ten point Visual Analogue Scale (VAS) with 0 being no confidence at all and 10 being complete confidence. (See Appendices C,E, F for comprehensive details). The aspects that were measured are listed, along with the average rating for each provided, in **Table 5**.

Table 5: Confidence measures and ratings

Confidence Measures (10 point VAS)	Average rating
Confidence in examining patient before and after first telehealth consultation	
Junior doctors	Before (4.2), after (6.5)
Doctors' confidence in assistance provided by nurses	
Junior doctors	9
Senior doctors	8.7
Confidence in assisting with physical examination	
Nurses	8.6
Confidence in clinical decision making	
Nurses	7.6
Senior doctors	8.8
Confidence in following doctor's instructions	
Nurses	7.2
Junior doctors confidence in nurses	7.4
Senior doctors confidence in nurses	8.8

In **Table 5**, the average rating for each confidence measure was mostly between the ranges of 7 and 9 for most of the measures. The junior doctors' level of confidence had grown after being part of telehealth consultations. Importantly clinicians within the team were confident in each one's ability.

The comments highlighted that confidence was not absolute and was based on the amount of experience with telehealth, the types of cases treated via telehealth and the competency and skills of the telehealth team members:

With experience comes confidence:

"The fact that there are no doctors available at the hospital makes it more difficult to make certain decisions. In the ED, one can observe or treat the patient and be able to act if there is deterioration but that is not the case in those hospital so early transfer to a larger hospital might be organised when this would may not have been necessary." [Junior doctor, P1]

"Difficulty assessing sick patients over telecommunication system. No actual human interaction." [Junior doctor, P6]

"Not understanding what the doctor wants, not wanting to interrupt them because of the telehealth setup. Not having an already established working relationship with the doctor so they know your abilities and you know theirs."[Nurse, P28]

"Doctors not being aware of the service the hospital provides example no Pathology, X-Ray etc overnight." [Nurse, P14]

Trusting the other clinicians on the team:

"The success of the consultation was strongly affected by the competence of the referring health practitioner." [Junior doctor, P6]

"Mainly with regards to physical examination of patient, I'm generally happy with general inspection of patient. I can do that easily with visual and auditory things available through telehealth but when it comes to listening to the heart or specific things. If there is a specific diagnosis which would be elicited by a physical examination and you have staff at the other end that are not trained in physical examinations then that is a limitation. I don't think there is any way to overcome that except if there is a doctor on the other end." [Junior doctor, P8]

"I am only confident with their decision because of my past ED experiences. However I am not 100% confident for junior nursing staff - only because the process relies heavily on Accurate and thorough nursing assessment and experience. This experience extends to triage which many staff need further training and guidance I don't believe also that the doctors can get accurate vision to diagnose rashes, oral cavities, eyes etc. nor can they palp or auscultate chests / abdomen." [Nurse, P28]

"I worked in Wangaratta ED for 4 days (placement) and have met a lot of the doctors and have seen the set up there and for this reason have a high level of confidence in the doctors there. If the doctor doing the telehealth has a negative body language and or attitude, the experience gives less confidence." [Nurse, P26]

The majority of nurses and junior doctors had only used the telehealth system between 1 and 5 times. With more experience, both groups may gain confidence in treating patients, in physical examination and also building rapport within the telehealth team. In response to the concerns around remote physical examination, a specially produced training video has now been developed by the project team and addresses this issue in detail.

So, overall, clinicians were not stressed when telehealth was used, however, they felt less confident when it came to certain cases that required more physical examination. They also expressed concern over trusting the nurse or doctor at the other end if they had not established rapport with them. This situation could be improved with more experience. As highlighted by Eley, Fallon, Soar, Buikstra, & Hegney, (2008), the confidence that nurses had towards Information technology was directly related to their experience with the technology. Telehealth is a useful alternative in the after-hours. For clinicians to gain confidence in its use, more experience is required.

Answer to study question:

To what extent has telehealth impacted the effectiveness of care?

Clinicians reported confidence in being able to provide care that achieved the desired outcomes. However, while most clinicians were aware of guidelines around setting up a telehealth consultation, choosing the appropriate patients and completion of paperwork related to the consultation, some were not. Most of the nurses and junior doctors had received training in telehealth. The clinicians reported that telehealth did not add to their levels of work place stress; however some reported feeling low levels of clinical confidence if the case required physical examination. Some nurses reported that they were hesitant to use telehealth stating that the administrative procedures were too time consuming. Others stated that even though a patient could have been referred to telehealth they felt they had the necessary experience to resolve the issue on hand and did not need to make the referral. Importantly all clinicians highlighted the importance of trusting the nurse/doctor at the other end.

Data at a glance



Overall the doctors and nurses were not stressed when telehealth was used, but felt less confident when it came to cases that required more physical examination.

The nurses seemed quite confident in assisting with physical examination of patients (average rating of 8.6).

8.6

9

The doctors' were confident in the assistance provided by the nurses at the UCCs (Average rating of 9).

Safety



Some of the clinical data retrieved from the NHW ED telehealth database highlighted potential issues around monitoring quality and safety. Some background information is first provided, followed by results.

In July 2014, Quality and Safety measures were introduced to enable timely auditing of the quality of telehealth consultations, to ensure safety in delivery of medical care to patients. 201 patients were seen during this 11 month period of time – 1st July 2014 to 31st May 2015. Given the more junior level of doctors on overnight in the NHW ED, two points of follow up were implemented:

Junior doctors on overnight duty hand over all telehealth patients in the morning to senior medical staff – this is not a recorded exchange of information, but ensures appropriate treatment is always given, and a timely subsequent follow up if required (no episodes of follow up care reported to date).

Senior ED doctor reviews the medical notes of each telehealth patient, then completes the Quality and Safety fields in the NHW ED telehealth database (Please refer to Appendix B for more detail)




Table 6: Quality and Safety Audit Data

%	Yes	No	Total (complete dataset)	Missing data (all referrals)	VC did not proceed (all referrals)
Appropriate referral	98.2	1.8	100	10.4	-
Adequate referral information	98.8	1.2	100	15.4	-
Correct Diagnosis	100	0	100	29.8	2.5
Appropriate management	96.3	3.7	100	31.3	2.5

Results indicated that the process of referral was in line with guidelines with adequate quality of information documented in the referral process. The results for appropriate telehealth referrals and documentation reflected well for remote nursing staff, and indicated that the use of telehealth had been appropriate and of a standard that should build a good trusting relationship between health services.

There was a notably higher level of missing data in the medical consultation notes when compared with ISBAR referral notes. There are a number of possible explanations for the extent of missing data relating to the manual nature of management of the database:

- Telehealth patient data is not reported through Victorian Emergency Minimum Dataset (VEMD). A separate database, entitled NHW ED telehealth database, had to be maintained for the telehealth consultations.
- ISBAR referral details were electronically entered at an earlier time than the medical consultation notes – administration staff entered demographic details and time of referral, and nursing/ project staff entered clinical details of referral.
- Entry of medical consultation notes on to the NHW ED telehealth database was done by nursing / project staff during business hours.
- Quality and safety fields were lastly populated by an appointed ED senior medical officer on review of the patient’s medical file and completion of all database fields.
- The patient’s medical file, or paper based notes, were filed on completion of the Quality and Safety audit - occasionally telehealth notes were taken with patient file to other departments or inadvertently filed before the medical officer completed the database entry which complicated the completion of audit.
- The system of quality and safety entry to database was introduced 15 months after commencement of service and took some time to become usual practice.

Maintaining a high quality, electronic database was challenging in the absence of VEMD reporting for telehealth consultations. ED administrative staff had to manually remove patients from the workload before sending data on to Health Information Services (HIS). A second round of manual checks was undertaken by HIS staff to ensure telehealth presentations were taken out of the VEMD data. Telehealth patients were registered in the NHW ED workload at the time

of referral to fully integrate telehealth patients in to the ED workload. This enabled patient details to be included on the electronic work board in the ED work station, with all registered patients promoting seamless management of remote patients.

Optimal management of the database is still evolving, to accommodate for changes in staffing and electronic solutions for retrieval of data. The aim is to have an ED clinician with an interest in research to take responsibility for database management. This has been difficult to achieve in the busy work environment of the ED and timeliness is subject to the variations of staff rostering. This is not ideal.

Answer to study question:

To what extent did telehealth impact the safety of care?

Appropriate referrals were being made for telehealth and the management of care was appropriate for these cases. The administrative procedure for the recording of telehealth consultations seemed time consuming and resource intensive. Since the VEMD had no provision for telehealth consultations, these episodes had to be recorded manually and separately, leading to incomplete records. This could be a future concern, and potentially affect the continuity of care and make quality a safety auditing difficult.

Data at a glance



▶ A substantial amount of data was missing from database that reflects the challenging nature of manually maintaining a parallel patient record in an automated system, and warrants a review in deficiencies of documentation

Efficiency and Sustainability

Efficiency and sustainability was defined as achieving desired results with most cost effective use of resources. In this evaluation, it was related to providing a system for managing afterhours low acuity presentations when GPs were unavailable, providing a feasible alternative to them maintaining onerous on call arrangements. This had to be achieved within the existing staffing parameters and workload for clerical staff. Further, efficiency and sustainability was related to ongoing and projected future costs in addition to the potential for the service to be maintained beyond project phase and potentially expanded.

Difference in time spent on after-hours calls by GPs

GPs were asked whether there was any difference in the time they spent on after-hours calls. 6/9 participants stated that telehealth has not made a difference to their after-hours roster:

"On call was initially 3-4 weekends per month, now down to 2-3 weekends per month. and there are more doctors in town. We use telehealth between 11pm and 7am as the first option. Because of after-hours, people were leaving. Now, doctors are staying back. We would have gone down to 3 GPs if not for telehealth. We now have 12 GPs in town." [P1, Yarrawonga, GP]

"Still on call, but relieved of some of the attendances, say about 1 or 2 attendances."

[P2, Yarrawonga, GP]

"Still got the same roster in place, telehealth hasn't changed this but we made a decision that the doctors here would be the first contact. It is less common circumstances where telehealth is used." [P5, Myrtleford, GP]

Based on the comments, one GP from Yarrawonga (P1) had commented that telehealth had made such a difference to retaining doctors in the region. GPs were leaving due to the increasing burden of after-hours calls, but since telehealth, many had decided to stay. The other participant from Yarrawonga (P2) stated that telehealth has certainly reduced the number of attendances at hospital, which had meant that the he/she had been able to get a good night's sleep and be more productive the next day.

There were some key differences in the adoption of telehealth by GP practices, and subsequently the impact on their after-hours workload for patients presenting with category 4 & 5 conditions:

- In Yarrawonga, telehealth was utilised between 11pm and 7am. The GPs were called only if the case was complicated in nature.
- In Myrtleford, GPs preferred to be the first point of contact. Therefore, telehealth is rarely used.
- In Beechworth, afterhours care is provided by GPs on alternative weekends. Telehealth is available on the other weekends but is rarely used.
- In Bright, the first option was for the nurses (who had been upskilled and trained) to provide care. The second option was for them to contact the GP on call. Telehealth also provided the third option for the nurse to connect using the prac cart with the GP (using tablet or telephone) to see the patient however this is rarely used as the system was perceived as too slow and a phone call, much faster.
- In Cobram, Category 4 and 5 patients are eligible for telehealth overnight, however many were happy to wait to see the GP the following day. Nurses were also well experienced and could handle most cases.

- In Corryong, the GPs were still on call 3 in 4 weekends, but the number of after hour calls and patient transfers had reduced since the 'doctor free' weekends prior to the ED telehealth service. Similar to Bright, the nurses had been specially trained and their competencies improved to manage without a doctor always available. This meant they could treat more issues, use telehealth if required or call the GP depending on the circumstances.
- In Numurkah, the GPs were still on call – this remains unchanged. ED telehealth was recently implemented in this region, which is just 20 minutes from Shepparton, so the benefits were yet to be seen.
- In Benalla, the GPs are on call for Cat 1, 2 and 3 presentations. Category 4 and 5 patients are referred for ED telehealth overnight for most, but not all GPs. Flexibility in this arrangement allows for variation, and supports all GPs in their delivery of after hours service to the UCC.

Since ED telehealth was being utilized in different ways across the various regions, the benefits in regard to reducing after hour calls may not be apparent in all regions. Also, the maturity of the system varied between sites. This most likely impacted the take up and subsequent improvement to GP after-hours calls. Full details of the responses from GPs is found in Appendix G.

Difference in administrative workload

The clerical staff was asked about their workload and the impact telehealth had on this. The average rating for increase in workload was 55%. Comments included:

“Unable to give nursing staff at hospitals timings regarding when the telehealth can be used due to demands in the ED. Can be frustrating when you input all the patient’s details onto Vital and then the patient is not prepared to wait until the doctor can use telehealth.” [Clerical staff, P1]

“Sometimes when the nurse from the hospital rings us for a telehealth patient and they have never been to our hospital and we are busy with patients presenting face to face with us answering the phone it can be quite hectic.” [Clerical staff, P3]

“Sometimes in ED, when workload is a lot, telehealth consultation patients have to wait a little till my urgent workload is finished.” [Clerical staff, P6]

It must be noted that only six clerical staff responded to the electronic survey in round two compared to sixteen the previous year. It was reported by those that responded that the administrative workload had increased in the after-hours, as the staff managed the patients in the Emergency Department as well as requests for telehealth consultations. Also clerical staff reported heavy demand in the ED causing difficulty in providing an accurate waiting time, resulting in some patients not waiting and attending the telehealth consultation. These perceptions must be placed in the context of there being 276 referrals over a 25 month period of data collection. Whilst referral rate has increased since September 2014, and the average rate of referral is 22-24 referrals per month, overall the impact this makes on the ED workload was not significant. There is greater activity each month when Corryong links for weekend service.

Ongoing education is required for clerical staff to ensure that ED Telehealth patients are seen as a normal part of the ED workload and are entered into the ED queue at the time of referral in the same way as 'like' patients presenting face to face to the ED. Full details of Clerical staff responses can be found in Appendix H.

Data at a glance

6/9

6 out of 9 GPs stated that the after-hours roster had been maintained and remained unchanged

Telehealth had been adapted to suit each region's requirements



GPs may still be on call, but telehealth has relieved them of some after-hours calls

GPs at one site stated telehealth had improved recruitment & retention of GPs

55%

The average rating for increase in workload for clerical staff was 55%

Clerical staff were challenged by integrating telehealth referrals with the face to face queue during busy periods



It is important that ongoing education supports clerical staff in their management of telehealth patients

Difference in workforce recruitment/retention

The CEOs or Directors of Clinical Services/Nursing were asked whether telehealth had supported the recruitment or retention of staff in the organization. In other words, had telehealth helped in improving workforce productivity? details of the senior management interviews can be found in Appendix I. Three of the seven participants stated that it had not made a difference and 4/7 participants felt that it had (NB telehealth hub is NHW):

“Hasn’t made a difference in terms of attracting or retaining staff. Little difference, but we don’t have these issues in the region anyway.” [CEO, P1]

“No, we only use telehealth sparingly some staff haven’t taken it up haven’t used it – we have quite senior staff on night duty when it’s more likely to be used so they have been doing that role for a number of years so they are used to seeing patients without a doctor. They are comfortable managing situations themselves.” [CEO, P3]

“It has. We started with telehealth connecting with Wangaratta over 12 months ago. It was originally used as a strategy to retain GPs. We have 3 GPs who rotate on weekends. We employ GPs at our hospital. We didn’t want them to do one weekend. We give the doctors a weekend off call so that once a month we do telehealth with Northeast Health. We have now got a 4th year GP registrar. As the registrar has become competent and able to take on more after-hours call independently, means they have less burden on GPs. If doctors are overworked, they can move out. So it’s a juggling act. What we need and what we want and what we can get. Recruitment and retention is dependent on family environment and here there is no private school, no restaurants or night life. We recognise that we have to make it attractive. Beautiful place but people want family life. Time off for doctors helps.” [CEO, P4]

“I don’t think I can relate it directly to either of these, but leadership of telehealth has contributed to our reputation as an innovative health service. Attracted a lot of interest nationally that wouldn’t have happened before. Use of technology to provide access to patient care was a key reason we won regional health service of the year 2014. Contributed to reputation and grown our partnerships. 2 examples. Within the Hume Corryong health service, they are not an immediate part our family. Corryong with telehealth has become a partner and early adopter. The technology is very helpful to them every 4th weekend when they don’t have GPs. In this current environment there is increased focus on supporting the sustainability of district hospitals, and telehealth has helped in this regard. We have 48 junior doctors rotating and we tell them about telehealth and they’re very interested in it. Another dimension to training experience particularly for under grad and post grad doctors operating into the future. Telehealth is part of the future and they are getting some exposure to it.” [CEO, P7]

Telehealth had made a difference in Corryong, where the GPs now get a weekend off to spend with family. This was considered as a way to establish a work life balance, which led to GPs staying in the community. In Beechworth, there was no issue around recruitment or retention of staff prior to telehealth, so it had not made a difference. The nurses at Cobram were well trained and competent in treating most patients. Therefore, telehealth was not utilized to a large extent. Thus, it had not made any difference to workforce productivity. Lastly, in Wangaratta, the providers of the telehealth service, the healthcare organization had gained a reputation for their leadership. Through telehealth, they had established partnerships with health services such as Corryong. Junior doctors who were working at Wangaratta have had the opportunity to use and learn about telehealth during their training. This may help them in the future. Potentially, Telehealth, with increased use, could help in recruitment and retention of staff.

Ongoing and Projected Costs

The sustainability of telehealth was partly dependent on cost. According to the World Health Organisation, (2010), the most cited barrier to telehealth adoption globally, was the perception that the cost of telehealth was too high. The higher management in the healthcare organisations (CEOs or Directors of Clinical Services/Nursing), seemed aware of these costs and willing to accept them as a future expense:

"In terms of costs for us, telehealth unit itself is worth about \$10,000 per annum and this is an ongoing cost. Then there is potential for medical costs to be incurred like emergency physician undertaking review at the ED, not a cost at this stage but I would guess that the person needs to be paid about \$200 dollars an hour." [CEO, P1]

"If it goes on there will be costs. We do pay for connection, broadband and IT costs but because it is a project, the telecart was brought through the project funds. But once project is over we have to start paying. There will be some costs. We will look at that. We haven't reduced our doctor's salaries, even though they are taking fewer after hour calls. One of the other things is credentialing. Who owns the patients? So, medico legal questions, like who owns the patient history? We have already started considering this - for instance, the ED doctor is legally allowed to prescribe medication to patients in our UCC." [CEO, P4]

"The initial costs around establishing technology and buying the machines, hardware replacements and networks. Looking into the future maintenance of technology, the health services are not funded so we at Wangaratta have to think about this cost. Apart from that, a significant cost is the role of the project officer. We need a project officer to support the management of change over several years. Need at least 6-7 years for telehealth to be established. Major cost is to support the project officer who has to go to all health services to help in education, policies and procedures beyond the urgent care setting. There is also a cost around clinical governance." [CEO, P7]

The cost of maintaining the equipment was mentioned by all participants (7 in total). Aside from this, as seen in the quotes above, there may be ongoing expenses related to hiring of a full time project officer at North East Health Wangaratta, who could support the continuation and expansion of the telehealth service. Apart from this, as identified by one participant [P4], medico legal issues need to be considered such as ownership of the patient history. This, interestingly, has been covered in the MoU (Appendix K) and may therefore, highlight some lack of knowledge around its contents for some senior administrators, at sites where telehealth is managed by senior clinicians.

Clinical governance issues need to be considered [P7], to ensure that good, safe care would be provided to patients.

Continuation and Expansion of telehealth service

The GPs and higher management that were interviewed felt that the service should be continued and expanded:

“Definitely continued, and expanded if possible. Telehealth is a good alternative to telephone calls. For instance, if a nurse tried to get in touch with someone at the Royal Children’s Hospital for advice, but can’t reach the person, they can use telehealth with a regional hospital or they would contact us if it was an extreme situation.” [P2, GP, Corryong]

“Should be expanded and should be continued. It can be replicated over other small rural health services.. We don’t have many people presenting to our urgent care centre, but telehealth will help in reducing the back logs in EDs, if transfers can be avoided.” [CEO, P1] “Yes definitely. There aren’t as many unhappy doctors and patient get access to the care they need which is fantastic!” [P1, GP, Yarrawonga]

“Telehealth is definitely something that needs to be supported into the future. Ensuring consultations are funded at both ends of the system will help to encourage use. In rural and isolated areas with no public transport the ability to have specialist consultation and advice easily accessible is invaluable and needs to be promoted heavily.” [Director of Clinical Services/Nursing, P5]

Answer to study question:

Is telehealth a sustainable initiative when costs and human resource issues are considered?

Telehealth is sustainable. The higher management understood the potential of telehealth and wish for the service to be continued and expanded. They were also aware of future costs (equipment, maintenance and regional telehealth governance). The full advantages that afterhours telehealth can offer in supporting UCCs and GPs have not been fully realized. In mature sites improvement is evident in GP lifestyle and retention. Time is required for GPs and nurses to adapt and utilize the technology and its potential to enhance after-hours care.

Data at a glance



Just over half of the senior administrators felt that telehealth had made a difference to improving their workforce recruitment and retention

The hub site described broader staff advantages such as leadership and opportunities for junior doctors to experience telehealth



In some UCCs where the existing nursing staff was very experienced and telehealth still relatively recent, telehealth had not been used to a large extent at this point

All CEOs or Directors of Clinical Services/Nursing identified equipment maintenance costs as a projected cost



An ongoing role of project officer at North East Health Wangaratta was identified as a cost

Surprisingly Medico-legal were identified as a projected cost. This response may highlight some misunderstandings about medico-legal responsibilities in regard to telehealth



The perception amongst higher management was that telehealth must be expanded and continued. The same perception was held by the GPs

Telehealth was perceived to be a valuable service. Its potential was understood



Discussion



The following section discusses the results in relation to other studies, strengths, limitations of the study and future research and finally the meaning and generalisability of this study.

Results in relation to other studies


“Telehealth services such as video-conferencing - when used appropriately - are emerging as effective ways to complement local health services. They can: deliver health services into remote communities, reducing the need for travel; provide timely access to services and specialists, improving the ability to identify developing conditions...” (National Rural Health Alliance, 2013)

The Hume region after-hours telehealth service has provided patients with better access to medical care and reduced the number of transfers to bigger hospitals for treatment of minor issues. The word “appropriate” in the quote is important. It was reassuring to find that referrals for telehealth were suitable and in line with the guidelines and it was further confirmed in this study that clinicians understood when telehealth was not appropriate for treating a particular case. Over half of the presenting patients were treated using telehealth and discharged home. The appropriateness of the referrals made to telehealth was further reinforced by the finding that the majority of patients were satisfied with the process and outcomes of their care, found the technology acceptable and reported being treated with dignity and respect. Overall the wait times and treatment was reported by patients to be largely analogous with a face to face encounter. In the 20 % of patients who were assessed using telehealth as needing transfer to the regional centre, first line treatment was established.

In one of a series of seven papers all of which were developed by the Royal Australasian College of Physicians (RACP) telehealth working group, Sabesan, et al., (2013), discussed the appropriateness of telehealth using two case studies. The paper suggested that telehealth was appropriate to treat patients suffering from minor ailments, especially in remote communities as this reduced the need for them to travel. They also suggested the telehealth be used to treat minor issues, until the clinicians gain more confidence in managing these issues. They can then manage more complex cases in the future. This evaluation aligns with this research.

General Practitioners

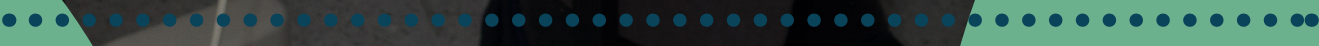
An interesting finding from this evaluation was that the reluctance of some General Practitioners’ in using the telehealth system to alleviate their afterhours work, despite this being a central driver of this project. This finding may align with the work by Poultney, Maeder, & Basilakis, (2015) who reviewed several Australian telehealth projects. GPs were found to fear new concepts in general and therefore, hesitant to adopt telehealth. The reluctance of some GPs to utilize the telehealth system may however be more of an issue of professional autonomy (Skar 2010). Telehealth may be seen by some GPs as encroaching on their professional turf. GPs in rural and remote communities are very well known and valued in their respective community (White , 2002). Some GPs may fear that patients accessing telehealth for afterhours care.





Handwritten notes and data on a clipboard. The form includes a patient information section with fields for Name, Address, and Date of Birth. Below this is a table with columns for various vital signs and a section for notes. The healthcare professional is using a blue pen to write in the notes section.

Time	Temp	Pulse	BP	SpO2	RR	Notes
08:00	37.5	72	120/80	98	18	
09:00	37.6	74	125/85	97	19	
10:00	37.7	76	130/90	96	20	
11:00	37.8	78	135/95	95	21	
12:00	37.9	80	140/100	94	22	
13:00	38.0	82	145/105	93	23	
14:00	38.1	84	150/110	92	24	
15:00	38.2	86	155/115	91	25	
16:00	38.3	88	160/120	90	26	
17:00	38.4	90	165/125	89	27	
18:00	38.5	92	170/130	88	28	
19:00	38.6	94	175/135	87	29	
20:00	38.7	96	180/140	86	30	



could jeopardize that established highly regarded relationship. Interestingly, in this evaluation, there was a high rate of recommendation from ED doctors to visit the GP after a telehealth consultation and many patients reported doing this. Notwithstanding for some GPs the relief felt at removing the burden of afterhours call ins was a 'game changer' in terms of their work life balance and decision making regarding their tenure as a small town GP.

Further to the issue of some GPs lack of engagement with the afterhours telehealth was the finding that GPs reported not receiving notification that their patients had used the service. It seems that discharge notification or letters were not routinely sent to GPs during the period of the evaluation. This may hinder continuity of care. As stated by Alazri, Heywood, Neal, & Leese, (2007), inter-organisational communication was important for consistency (avoiding conflicting advice) and central to the continuity of patient care- it was the responsibility of healthcare professionals to ensure that this communication occurred to avoid disruptions to the provision of care.

Nurses

The nurses played a key role in the success of telehealth in this project. They consistently made accurate decisions regarding when to initiate a telehealth consultation. There remains however some issues from their perspective about the process of transferring patient data to set up the consultation and join the regional ED queue. Real or perceived there were reports from nurses that they found the process of emailing the patient data and speaking directly to clerical staff, the triage nurse and then the ED doctor somewhat repetitious and time consuming. It was reported that some nurses who were less confident with telehealth chose not to use it while some very experienced nurses with high level remote area training had the skills to deal with many low acuity patients without needing telehealth. Brewster, Mountain, Wessels, Kelly, & Hawley, (2013), conducted a systematic review around the acceptance of telehealth by front line staff for managing patients with Chronic Obstructive Pulmonary Disease (COPD) and Chronic Heart Failure (CHF). They found that initial positive experiences with telehealth would encourage the nurses to refer more patients for telehealth consultations, and increased the uptake of the technology by other nurses in the hospital. It is important to note that the authors chose 14 papers to review, and front line staff included nurses, health service managers, patient advocates, to name a few. As part of the same project around COPD and CHF Taylor, et al., (2015), collected data through interviews with frontline staff working at four community services in England, where telehealth was used. It was found that nurses were unsure as to when to refer a patient for a telehealth consultation, mainly due to the lack of training. In this evaluation study of Hume Region Afterhours telehealth, the nurses had been provided with training and guidelines. They indicated that they had high confidence in using the system and felt well treated by the staff at the regional ED but were frustrated by the paperwork and waiting time. More experience with telehealth and continued good encounters with the regional ED staff may in time lead to a greater understanding of how telehealth patients become part of the 'ED queue' and reinforce the positive aspects of the process.

Comparison with face to face care

The hesitation to use telehealth due to the lack of face to face interaction was mentioned in the literature and noted by some respondents as a potential barrier to the community using after hours telehealth. For instance, Hiratsuka,

Delafield, Starks, Ambrose, & Mau, (2013) recently found through focus groups with indigenous patients from Hawaii and Alaska and their healthcare providers, that face to face contact was an issue for patients and providers – patients due to the lack of personal connection and providers, of the fear of missing out on an issue. But, there is literature to the contrary and this seemed to be more in line with the findings of this evaluation of Hume Region Afterhours telehealth. Ekeland, Bawes, & Flottorps, (2010) for example undertook a systematic review of reviews on the effectiveness of telehealth and found that there was no significant difference between telehealth and face to face consultations (80 papers reviewed). Ward, Jaana, & Natafji, 2015, conducted a systematic review of the use of telehealth in emergency situations (accepted manuscript, yet to be published). Three studies that were reviewed in regard to ophthalmology assessments found no difference in results between telehealth and face to face consultations. This was found to be the case across various specialties. Poultney, Maeder, & Basilakis, (2015) who evaluated Australian telehealth projects, found that there was no significant difference between a telehealth consultation and face to face consultation. A successful telehealth consultation, like a face to face one, was dependent on the communication between the doctor and the patient. As stated by Ha, Anat, & Longnecker, (2010), a doctor should be able to gather the relevant information to diagnose the patient, counsel appropriately and provide instructions, which would help in establishing a caring relationship with the patient. This article was written without technology support in mind, but can be related to this context. It is important for the doctor to communicate effectively with the patient, so that they do not feel that telehealth is significantly different to a face to face consultation. Our findings support this, with patients reporting high satisfaction with privacy, confidentiality, ability to make decisions about the care they received and the similarity between the telehealth consultation and face to face consultation.

Sustainability

Sustainability of telehealth was discussed by the CEOs in this study. Some recognized funding and medico legal issues as challenges to the sustainability of telehealth. Ongoing regional governance and leadership was recognized as crucial. In addition to these factors the literature reveals other factors that are also relevant to this evaluation. For instance, Wade, Elliott, Karnon, & Elshaug, (2010) focused on the vulnerability and sustainability of Australian telehealth services. They conducted 34 semi-structured interviews in 35 healthcare services that were providing telehealth. The services were being provided in different states across different specialties including emergency medicine. Nineteen clinicians, 11 researchers, 4 managers and 2 telehealth coordinators were interviewed. The longevity of the telehealth service, number of clients, and source of funding was also considered. They observed from projects that had failed that the key issues were inadequate funding, not only for the term of the project but for maintaining telehealth in the future; clinician uptake of the technology; reliance upon just one person such as a telehealth coordinator to maintain the project and raising awareness of telehealth within the communities. These findings are highly relevant to this evaluation.

Junior Doctor workload

An interesting finding in this evaluation was that no participant commented on an increase in workload for the NHW ED junior doctors. This is contradictory

to literature such as the study by Westbrook, et al., (2008). This paper reported on an evaluation of the Virtual Critical Care Unit (ViCCU) telehealth system that provided a link between the Blue Mountain District ANZAC Memorial Hospital (BMH) and Nepean Hospital (NH), for emergency care for acutely ill patients. No ED physician was present at BMH so specialists in NH provided advice and treatment via telehealth. Interviews with 13 specialists at NH revealed comments on an increase in workload and telehealth being perceived as “another distraction”. Although this study focused on specialists, their role in telehealth was similar to the junior doctors in this evaluation. The lack of comments on the workload increase for junior doctors is a positive finding. Given the average referral rate was less than one per day from 11 actively referring sites, this finding should encourage the other hub sites (GVH, AWH, NH) to commence service delivery without need for extra resources.

Medico legal issues

In regard to medico legal issues, Wade, Elliott, & Hiller, (2012) studied the ethical, medico legal issues and governance around Australian telehealth projects. 36 participants across thirty-six telehealth projects were interviewed. Six Australian states were part of the study covering various medical disciplines. An interesting finding was that two participants felt that telehealth reduced medico legal liability as the patient need not drive or be taken elsewhere for further care. In terms of clinical responsibility for care, it was perceived that the hospital, in which the patient was based, was responsible for his/her care. The doctor at the other end was only providing advice. In comparison, the ED in this service was responsible for providing medical care to the patient which was within the scope of practice at NHW ED. The nurse at the patient end was responsible for delivering the ordered treatment within the scope of practice at the UCC – terms of these agreements were contained in the MOUs between the health services.

Community awareness

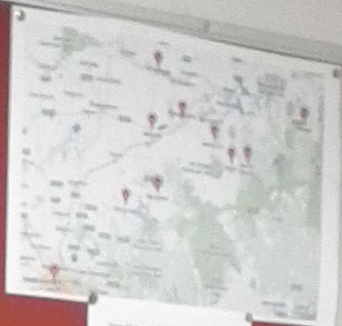
This evaluation was unable to determine how well-known the afterhour’s telehealth service is in the various communities that it serves. The nurses at the UCCs were unsure about the community knowledge of the availability of telehealth but were clear that when encountered it was generally well accepted. Both doctors and nurses seemed to believe that telehealth had reduced the number of ambulance transfers however at the time of this evaluation this could not be verified by any robust data.

Overall, sustainability of clinical care supported by telehealth is dependent on resources, both financial and workforce, uptake of the telehealth system by clinicians and the community, and sage consideration of legal aspects. The Hume Region Afterhours Telehealth Project seemed very well resourced with excellent implementation of hardware and soft ware compatible with each site’s context and wishes. The data collected as part of this evaluation demonstrates appropriate patient referral and appropriate clinical care.

Home Region ED Telehealth

Home Region ED Telehealth

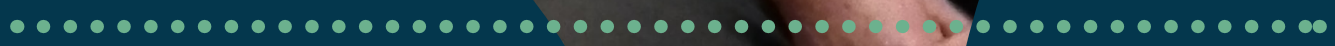
Home Region ED Telehealth



Home Region ED Telehealth

Home Region ED Telehealth

Residential Health
In-reach
ILLOURA
V.C. No.
661 030



What worked well and what could be improved in the project?

Table 7: What was working well and what could be improved in project

What worked well	What could be improved
<p>The technology: With the exception of minor glitches, the telehealth system worked well in all the UCCs and ED.</p>	<p>Increasing awareness of General Practitioners and community: Awareness amongst GPs and the community could be improved. This could encourage GPs to establish a balance between their after-hours calls and after-hours telehealth consultations. Increased awareness amongst the community may lead to more use of telehealth however it is noted that this a fine balance between awareness and the undesired outcome of using after hours telehealth for primary care. To date there has been no evidence of this.</p>
<p>Access to care: Telehealth improved access to care. Patients were able to seek medical care after-hours, in what they considered to be a reasonable amount of time.</p>	<p>Increasing awareness around completion of clinical documentation: Either through training or guidelines, the junior doctors and senior doctors must remain vigilant of the process involved in completing the clinical documentation for each telehealth referral case in a timely manner</p>
<p>Responsiveness: The patients and clinicians felt that they were being treated with dignity and respect, the patient’s privacy and confidentiality was maintained, and they were allowed to make decisions and choices about their care, during a telehealth consultation. Patients were quite pleased with the service and believed that privacy and confidentiality were not concerns for them. Some GPs however were not aware if their patients were using telehealth</p>	<p>Guideline around GP letters: At the time of this evaluation, there was no guideline around when to send a letter to the GP regarding the telehealth consultation. Guidelines around this issue could support continuity of care through improved communication amongst the healthcare providers.</p>
<p>Effectiveness: The doctors and nurses were not feeling stressed when using telehealth. This is a positive result when one considers the fact that the doctors were not able to examine the patient, and the onus fell on the nurses who assisted with this examination.</p>	<p>Including telehealth data in the VEMD: At the time of this evaluation, the occurrence and details of a telehealth consultation were recorded in a separate database entitled NHW ED telehealth database. This led to an increase in administrative workload. The telehealth data needs to be incorporated into the VEMD. Accurate records can then be maintained with ease and quality and safety audits facilitated.</p>



What worked well	What could be improved
<p>Efficiency and sustainability: A positive finding was that no participant commented on an increase in workload for the junior doctors (based in NHW ED).</p>	<p>Education and training for nurses: Nurses were at times, hesitant to use telehealth. Some felt that the administrative procedures were too time consuming, others felt that they had the experience to resolve the issue on hand. Sites need to further embed ED telehealth training into education and training. Use of training videos could assist this process, when findings from this evaluation can be incorporated into a video specifically for nurses. This would provide nurses with a time flexible tool for training themselves or others better comprehend the process involved in a telehealth consultation and when a referral is appropriate.</p>
<p>Training for junior doctors: Earlier this year (2015), the project team developed training material, including videos for junior doctors. This was a very important step as these doctors are the ones who treated patients in the after-hours. Since they were not permanently based in the hospital, a set of training material could help in training each new batch of junior ED doctors.</p>	<p>Ongoing education for clerical staff: Ongoing education could support clerical staff in their management of telehealth patients and help in understanding the telehealth referral process.</p>
<p>Memorandum of Understanding (MoU): The project team has developed a clear, detailed MoU for each site. The MoU followed ACCRM guidelines, making it adaptable for other telehealth projects and clearly outlined medico legal obligations.</p>	<p>Including telehealth in rural health curriculum: Implementing telehealth into rural health curriculum would enable future health professionals working in remote areas, to have an understanding of telehealth and its use for providing care. It could encourage the expansion and continuation of telehealth. Resources could be provided in an online format that is readily accessible.</p>

Meaning and generalisability of the study

The meaning and generalisability of the study will be discussed under the following - meaning for stakeholders who were part of this evaluation, meaning for other organisations and meaning for the field of telehealth in general.

What does this evaluation mean for the participants in this study?

From a patient's perspective, this study provides them with an understanding of the potential and limitations of telehealth. They get a realistic view of the telehealth service, in regard to the challenges faced during implementation, the various stakeholder perspectives, and what could be done to further expand and improve the current service. From a clinicians' perspective (junior doctors, senior doctors, General Practitioners, nurses), this evaluation provides each group of participants the opportunity to learn about the perceptions of the other groups. It also makes these participants realize that in spite of some limitations with telehealth, the patients are pleased with the service. These teething problems are considered minor – the service is seen as very beneficial. From a clerical staff perspective, they have the opportunity to understand how the telehealth system is being used and works. This study highlights the benefits that this service has offered to the respective communities. From a Chief Executive Officer's perspective, this study highlights the perceptions of the clinicians and patients in their respective regions, and in the other participating remote centers. It allows them to develop strategies to continue and to potentially expand the service.

What does this evaluation mean for other healthcare organisations?

This report provides a summary of what worked well and what needs improvement in a telehealth initiative that is quite vast in reach and has been running for over one year. This summary can serve as key lessons for any organization that intends to implement telehealth in Australia. This project employed a particular implementation model for telehealth in regard to network, hardware and software. Before this project, the internet connectivity in the regional areas was an issue. A plan was developed to overcome these issues and introduce technology that was suitable to the rural centers. This can be used by other healthcare organisations that intend to implement a similar ED telehealth service. Also, this evaluation may encourage the other potential hubs (GVH, AWH, NH) to get involved in providing ED telehealth services to their referring hospitals.

It is important to acknowledge the existence of the Australian guidelines for telehealth provision. Although this study covered much of the clinical aspects of the guidelines, the technical aspects were not covered. This was out of scope of this evaluation. But, it is imperative that all areas of the guidelines be considered in future work carried out at an organizational level.

What does this evaluation mean to the field of health informatics?

The findings of this study were related to the National Health Performance Framework. The results from the focus groups, surveys and interviews were mapped back to these indicators. This not only makes the findings relevant to the Australian context, but also provides an instrument that can be used for other telehealth evaluations (Maeder, Gray, Borda, Poultney, & Basilikis, 2015)

Strengths, Limitations of the Study and Future Research

It is acknowledged that this evaluation has taken place parallel with the implementation of a dynamic project and subsequently the evaluation team have adapted and worked flexibly to enable data collection and analysis with busy clinicians and patients.

This evaluation study has some strengths and limitations (**Table 8**). There are some unanswered questions that can lead to future research.

Table 8: Strengths and limitations of study

Strengths of study	Limitations of study
The data was related to the National Health Performance Framework. Applying these indicators has made this study relevant to the Australian context and provided a platform for future comparative analysis across different telehealth implementations.	Most of the users of telehealth (junior doctors, nurses and patients), had utilised it between 1 and 5 times. Therefore, their experience with telehealth was limited at the time of this study.
This evaluation focused on the experience of users of telehealth for after-hours care in Urgent Care Centres situated in rural areas, connecting to a regional Emergency Department. It made this study quite different to other research in the field of telehealth.	This evaluation was not based on a comparison of this project with other telehealth projects in Victoria.
The evaluation was based on the perspectives of a number of stakeholders. This enabled understanding of various perceptions.	The report focused on participants who had used telehealth. There was no data collected from users that had chosen not to use telehealth.

Future research:

What factors prevent clinicians or patients from initiating or being part of a telehealth consultation, when it is available in their community?

How much follow-up occurs with GPs after a telehealth consultation compared with follow-up post a face to face ED presentation?

What factors need to be considered if telehealth is used for purposes other than after-hours ED care?

What are the differences between the implementation of telehealth in rural setting and urban setting?

How does this project compare to other telehealth projects in rural or remote communities?

Can the National Health Performance Framework (NHPF) be used to evaluate other health technologies?


Conclusion




A scenario (excerpts taken and adapted from case studies in Leonard, 2004)

In a large academic health science centre around the mid-1990s, the diagnostic imaging department was transitioning to using electronic images of x-rays. In order to ensure that this was successful, the imaging department began to send doctors radiology results on a computer diskette or CD-ROM. However, doctors kept complaining about results not arriving on time. The doctors had difficulties in establishing a connection between the CDs and patient X-rays. So, the imaging department had a great idea – they started sending the CDs to the doctors via the internal hospital delivery system using the traditional large X-ray envelopes. Once the doctors recognized the envelopes, they opened it and placed the CD in their computer to view the X-rays.

The key lessons from this scenario that could be related to this evaluation are that people do not necessarily like change and take time to adapt to change. In this project, some nurses were reluctant to use telehealth. They felt that the process of getting a telehealth consultation was tedious. Some GPs still wanted to be the first point of contact and were reluctant for telehealth to be used. Some patients and junior doctors preferred to treat patients face to face, this being the way they were used to seeking and providing treatment. Having said all this, there was overall minimum resistance from all the participants in the study. All participants could see the benefits of the service and patients were willing to use the service again. This evaluation highlighted that telehealth use for after-hour calls between a rural Urgent Care Centre and a regional Emergency Department was a good initiative. The limited use of telehealth in the after-hours allowed healthcare organisations and communities the opportunity to comprehend some of the benefits of a telehealth service.






The themes that emerged from the data were mapped to the National Health Performance Framework. By doing this, it can be said that this project has made some difference to the way the remote communities in this project access after-hours care:

- People need not travel long distances to seek care afterhours (accessibility).
- People were able to stay in their community and get the care they require without unnecessarily being transferred to a regional hospital. Regardless of whether they were aware of the service, they were willing to use it (accessibility).
- The technology worked well with occasional minor glitches, mostly related to inexperience of use (continuity of care). This seemed acceptable to the patients and clinicians.
- The clinicians (junior doctors, senior doctors, nurses) could see the benefits of using the technology. As use of the technology increased and relationships develop, they may overcome some issues with trusting the party at the other end of the telehealth consultation, and have more confidence in choosing the appropriate patients for a consultation (effectiveness).
- Quality and safety indicators imply the ED telehealth service provided adequate safety and quality in a medical care.
- Although some staff surveyed perceived issues around arranging the telehealth consultation, the wait time from a patient perspective was still reasonable in comparison to seeing a doctor face to face (accessibility, efficiency and sustainability).
- Telehealth was seen as a sustainable initiative. Health service executives could see the potential benefits of telehealth and plan to expand its use into other areas of care (efficiency and sustainability).

The evaluation highlighted that telehealth can support the provision of urgent but low acuity medical care after-hours. It is an initiative that can increase access to care in rural communities, but, for telehealth to become 'usual business' in the provision of health care, sufficient time, adequate resources and effective change management is required.



Authors' Contribution

Ambica Dattakumar: Analysis and reporting for data for each participant group. Developing and writing this evaluation report.

Jane Kealey: Project manager in charge of implementation of telehealth at the various sites. Responsible for data collection, analysis of clinical data, and providing assistance with writing and completion of this evaluation report.

Helen Haines: Providing oversight on the data collection, contribution to writing and final completion of this report.

Kathleen Gray: Health informatics expert, providing comment on the report.

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Hume Medicare Local

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A broad range of stakeholders were engaged in the project to form a project Steering Committee, chaired by NHW's Chief Executive Officer. Included in this committee were representatives from the Department of Health, Hume Rural Health Alliance, the region's Medicare Locals (Hume and Goulburn Valley), Ambulance Victoria, University of Melbourne and key staff at NHW.

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Appendices



Appendix A - Literature Review Strategy

For the purpose of this review, relevance was defined as peer-reviewed journal and conference papers, published in English. The literature search for telehealth use in emergency care was limited by year (2010 – 2015). This allowed the researcher to find recent example of the application of telehealth to this field of work. A similar year limit was applied for searching for literature that could be related to the results. However, in some instances, articles that were beyond this limit were referenced as they provided some important, key messages. Google Scholar was searched using the following terms.

- “telehealth in emergency care”
- “systematic review telehealth emergency”
- “telehealth afterhours”
- “afterhours care” “telehealth”
- “telehealth emergency remote care”
- “afterhours telehealth”
- “continuity of care” “telehealth”
- “GPs perceptions of telehealth”
- “nurses use of telehealth in emergency”
- “confidence in telehealth”
- “sustainability and telehealth”
- “costs and telehealth”
- “legal issues” “telehealth”

Appendix B - ED telehealth data

An overview of patient data analysed from the NHW ED telehealth database revealed:

- **276 patients** were referred for ED telehealth between April 2013 and May 2015. 205 of these patients were referred after 1st July, 2014. With 11 sites linked since October 2014, service the **average rate of referral is 22 per month**.
- In 2 years, ED telehealth **prevented 144 patients from travelling** outside their local area for medical care after-hours. 55 (20%) patients had medical review and/or earlier treatment before transfer to their closest regional ED. 9% of patients required a face-to-face review by the GP on-call for Category 1, 2 and 3 presentations, and the same proportion (9%) of patients failed to wait for review.
- **9% failed to wait for an ED telehealth consultation**. In comparison to patients with Category 4 and 5 conditions waiting at the NHW ED, failure to wait during the same period of service was higher for Category 5 patients (10.8%) and lower for Category 4 patients (4.3%).
- **Waiting times for telehealth patients were highly variable**. Presentation time (at UCC) to time of referral, and therefore time to consultation, varied greatly. The major reasons for time variability are:
 - patients being first observed by nurses, to determine if medical intervention beyond their scope of practice was required (suitably qualified nurses in UCCs treat majority patients presenting with Category 4 and 5 conditions)
 - wait time is influenced by the NHW ED workload
- **Time of referral**
 - 47.5% of referrals made between 11pm and 4am
 - 1.5% of referrals made after 5am
 - 27.5% made between 8am – 9pm on weekends / public holidays (4 sites only)
- **70% referrals** were made for patients presenting with Category 4 conditions
- **Medications orders** were given in **72%** of the ED telehealth consultations.
- There was a **wide age distribution amongst patients** referred to the ED telehealth service:
 - Mean = 42 yrs
 - Median = 39 yrs
 - Standard Deviation = 27 yrs (68% of patients fall into this age range)
 - Range = 1 mth to 99yrs

Patient Referral Results

The following pages of results provide an outline of referrals by site, months of service, triage category, age of patients, days of referral and diagnostic groupings for patients presenting conditions. Tables with breakdown of waiting times by triage category are also included, and discharge destinations. 276 patients were referred to NHW for ED telehealth services from April 2013 to 31st May, 2015.

No Referrals x site (& length of service)

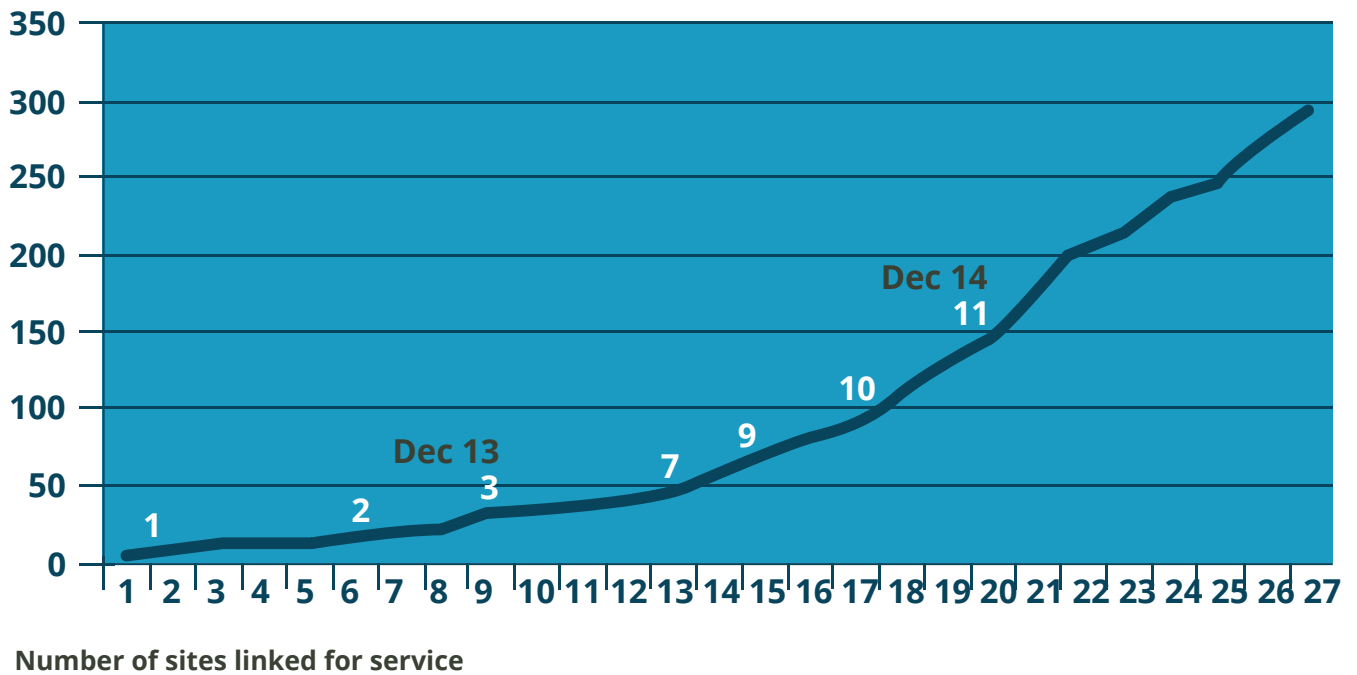
Table 9: Number of patients referred for telehealth consultation by location

	Site	VC enabled	Service commencement	Number of referrals	Service link
1	Yarrawonga	March 2013	March 2013	73	NHW
2	Corryong	Sept 2013	Sept 2013	74	Future link to AWH
3	Alexandra	Dec 2013	Dec 2013	1	NHW
4	Benalla	Jan 2014	Aug 2014	79	NHW
5	Mansfield	Feb 2014	April 2014	1	NHW
6	Myrtleford*	March 2014	April 2014	9	NHW
7	Bright*	March 2014	April 2014	11	NHW
8	Mt Beauty*	March 2014	April 2014	0	NHW
9	Beechworth	May 2014	May 2014	12	NHW
10	Cobram	June 2014	June 2014 (NHW)	7	Link to GVH Nov 2015
11	Numurkah	April 2014	Oct 2014 (NHW)	9	Link to GVH Nov 2015
12	Tallangatta	Aug 2014	? Sept 2015 (NHW) AWH ready	-	Possible link to NHW Future link to AWH
13	AWH	Aug 2014	TBA	-	TBA
14	GVH	June 2014	TBA	-	TBA
15	Seymour	Aug 2014	2015	-	Pending link to NH
16	Kilmore	Aug 2014	2015	-	Pending link to NH

*Alpine Health – campuses at Myrtleford, Bright and Mt Beauty

No Referrals – Cumulative total x months of service:

Figure 5 Cumulative total referrals x months of service



No Referrals x triage category:

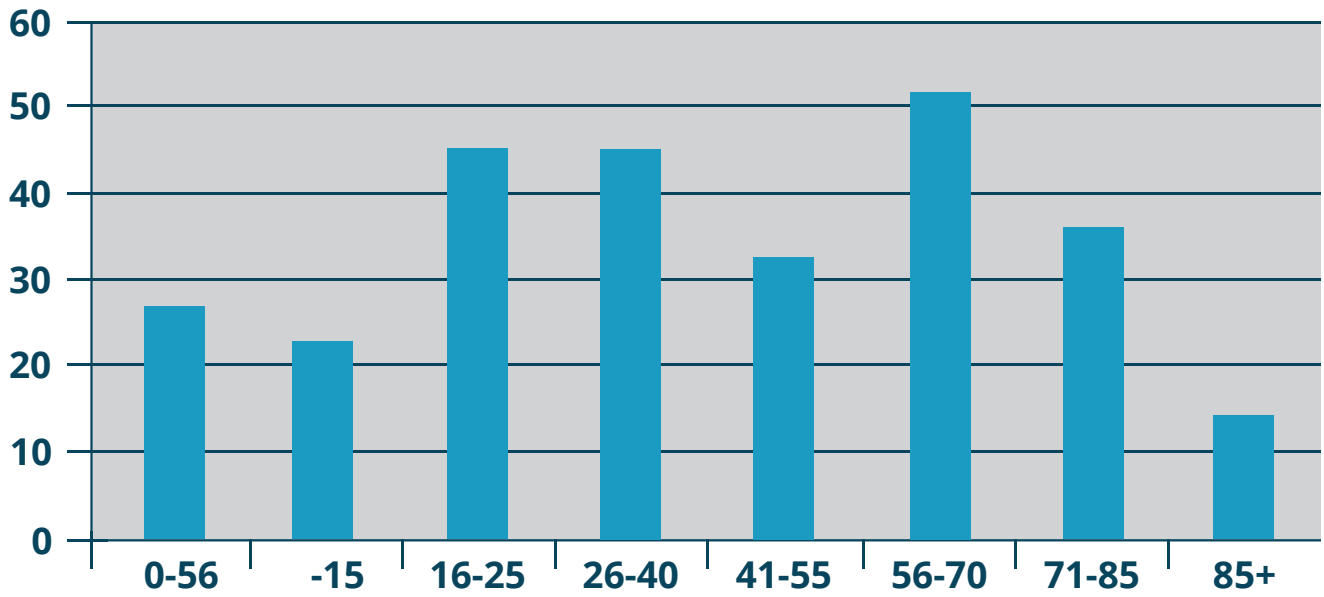
Table 10: Number of patient referrals by triage category

Triage Category (Cat)	No referrals	% referrals
Cat 2	2*	0.07
Cat 3	50	18.1
Cat 4	192	69.6
Cat 5	32	11.6

* Cat 1&2 unsuitable for service – staff advised to initiate immediate transfer of patient (no VC)

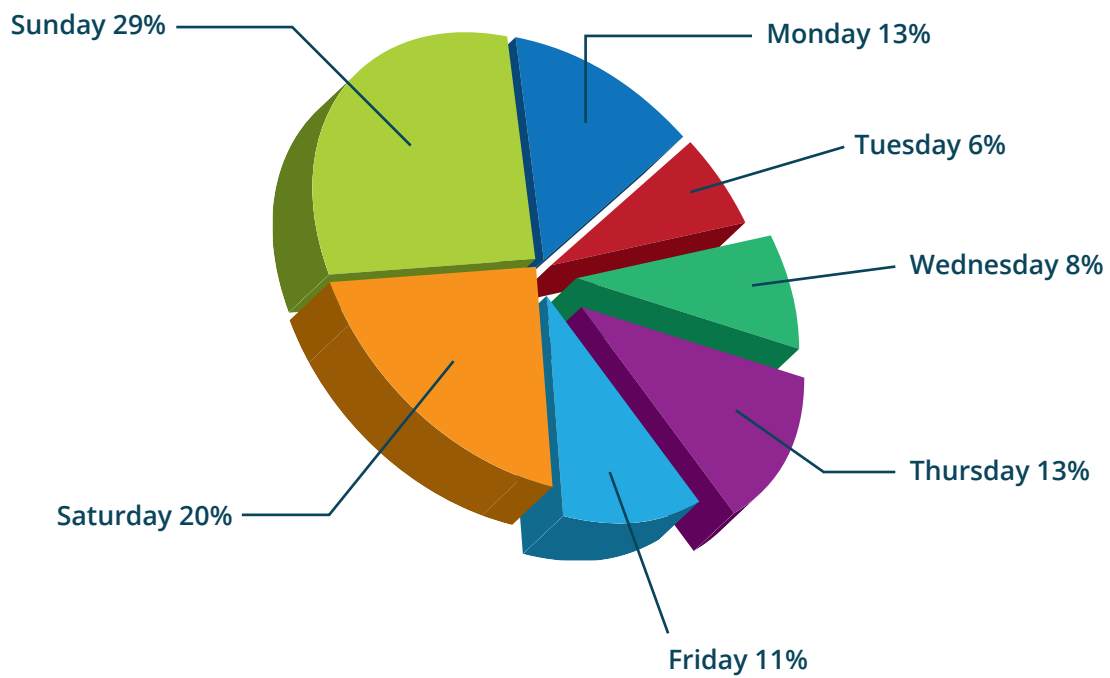
Age Groupings:

Figure 6: Age grouping of telehealth patients (based on ED telehealth data)



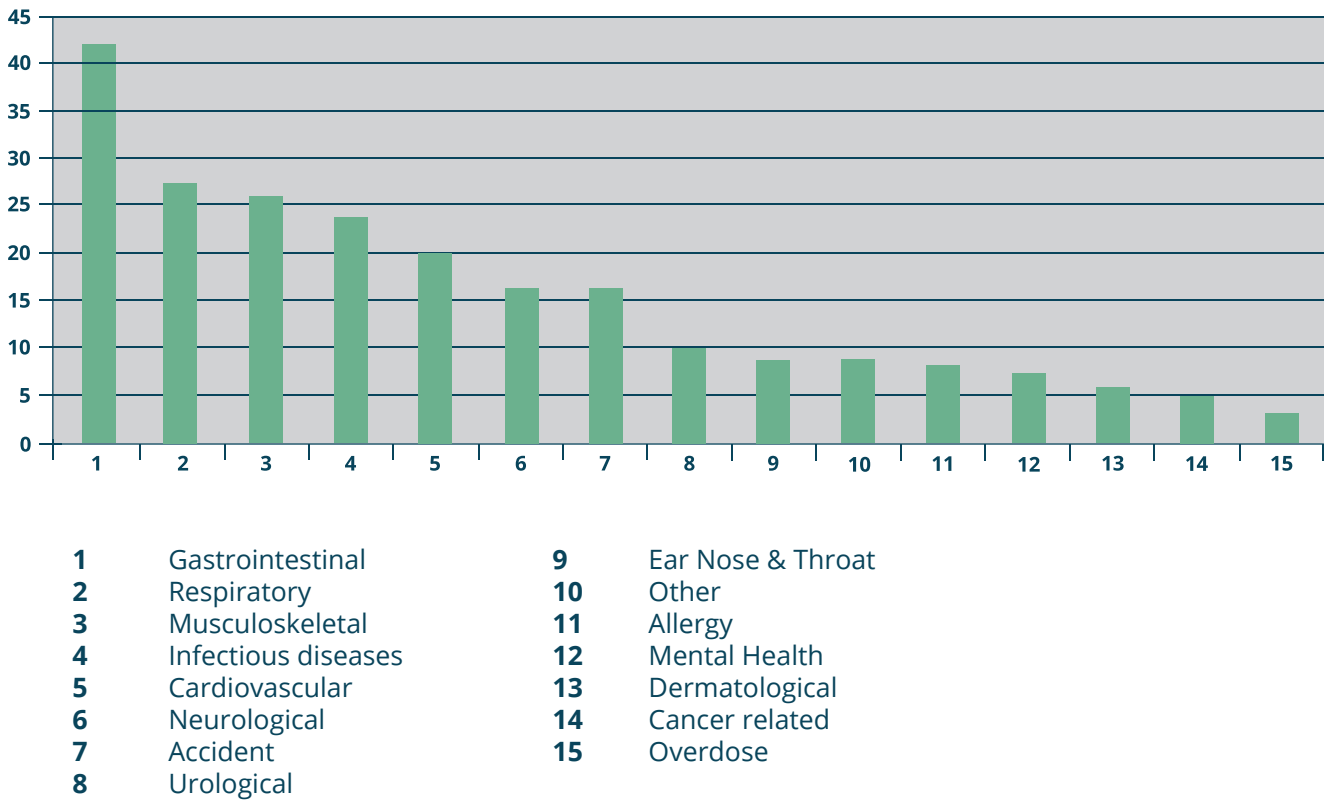
Day of Referral:

Figure 7: Day of referral of telehealth patients



Diagnostic Groupings:

Figure 8: Diagnostic grouping of telehealth patients based on ED telehealth data



Patient Wait Times - all records (apr13-jun14):

Table 11: Wait time between referral and consultation (based on ED telehealth data)

(mins)	Presentation to Referral	Presentation to Consultation	Referral to Consultation	Consultation Time
Mean	33 (43)	81 (71)	46 (28)	17.5 (16.5)
Median	33 (29)	65 (55)	35 (26)	15 (10)
Standard Deviation (SD)	38.5	58	39.5	12
Range	5 - 376	10 - 450	1 - 294	1 - 65
Mean / Median X Triage Cat				
Cat 3	44.5 / 35	81 / 68	37 / 35	20 / 20
SD	34.75	49.5	25	10.25
range	(5-184)	(20 -240)	(5-110)	(10-65)
Cat 4	41 / 30	80 / 65	48 / 35	17.5 / 15
SD	40	60	41	11.5
range	(5-376)	(10-450)	(5 -294)	(1-60)
Cat 5	44.5 / 40	87 / 75	45 / 30	7 / 5
SD	34.75	63	48	5
range	(5- 144)	(10-190)	(5-175)	(3-20)

(Reduced size of data sets Consultation Time - recording incomplete for completion time of consultation)

ED Wait times x Triage Category:

Table 12: Wait time between referral and consultation by triage category *

Mean (Median) Standard Deviation (SD)	Telehealth apr13/14	NHW ED 13/14	Telehealth 14/may15	NHW ED 14/15
Cat 3	24.8 (21.5*)	27.3 (17)	41.1 (36) SD 27.4	16.5 (10)
Cat 4	47 (44) SD 37.95	43 (26) SD 48.5	48.6 (35) SD 41.7	31 (16) SD 40.2
Cat 5	47 (30*)	47.4 (29)	46.5 (29) SD 50.9	32.9 (20)

* Limited datasets – 60% exact referral to consultation times missing April 2013 to June 2014. Data separated by year of telehealth service delivery, and compared with NHW ED wait time data for corresponding period. Based on ED telehealth data & VEMD data.

Failed To Wait (FTW) for consultation:

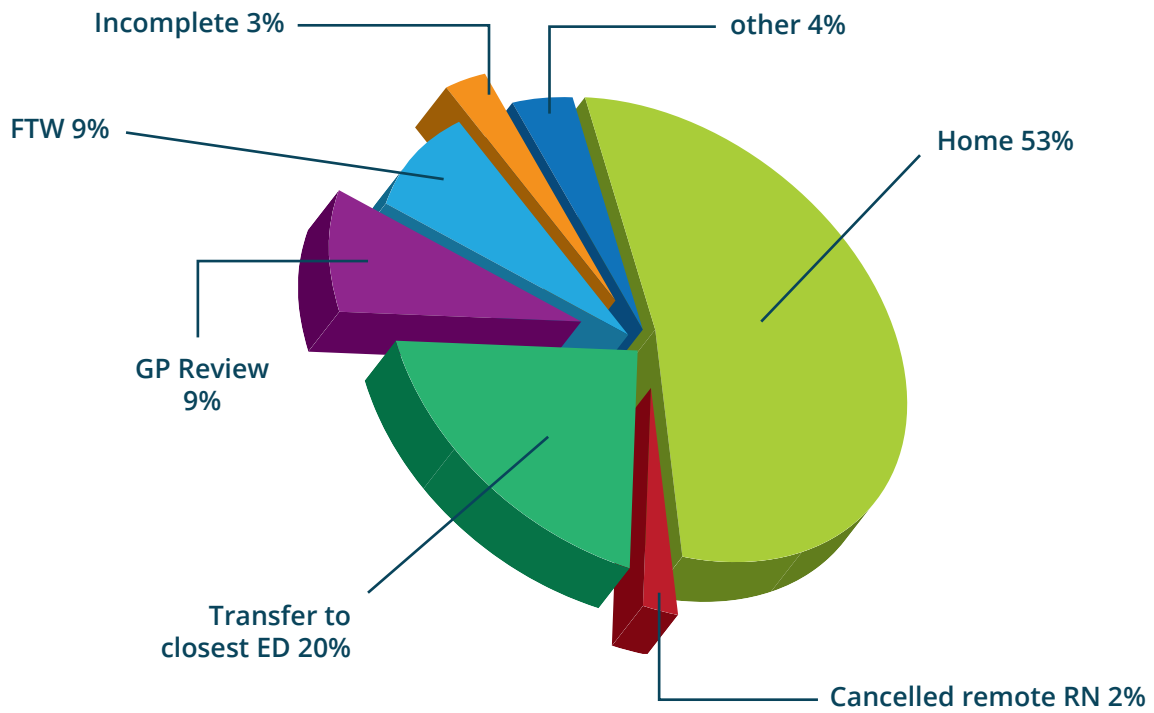
Table 13: Failed to Wait for Consultation*

%	13/14: Telehealth		NHW ED		14/15: Telehealth		NHW ED	
Triage category	X Cat	X total	X Cat	X total	X Cat	X total	X Cat	X total
Cat 3	0	0	0.9	0.3	5.9	0.9	0.9	0.3
Cat 4	8.7	5.8	5.6	2.7	8.4	5.9	3.7	1.8
Cat 5	0	0	15.8	2.3	17.4	1.9	9.3	1.1
TOTAL	-	5.8	-	5.3	-	8.9	-	3.2

*Telehealth referral vs NHW ED presentation based on ED telehealth & VEMD data. Separated by year of telehealth service delivery, and compared with NHW ED separation data for corresponding period.

Discharge Destinations:

Figure 9: Discharge destination of patients following telehealth consultation



FTW: failed to wait

Other: telehealth review before discharge; self presented at regional ED (NHW)



Quality and Safety Data

The following data was retrieved from the NHW ED telehealth database. The data was entered by a senior NHW ED medical officer, appointed to monitor and ensure the ED telehealth service is a safe, high quality medical service. The relevant fields are:-

- Appropriate referral to ED telehealth service
- Adequate referral information entered on to ISBAR referral form by remote nurses
- Correct diagnosis given by a NHW ED medical officer providing the telehealth service
- Appropriate management of patient – medical treatment ordered by the NHW ED medical officer adequately documented on telehealth Medical Consultation Notes

Table 14: Quality and Safety data relating to patient referral and patient management *

%	Yes	No	Missing data	VC did not proceed
Appropriate Referral	98.2	1.8	10.4	-
Adequate Referral Information	98.8	1.2	15.4	-
Correct Diagnosis	100	0	29.8	2.5
Appropriate Management	96.3	3.7	31.3	2.5

*based on ED telehealth data

Appendix C: Survey Data Analysis

Junior Medical Officers

Introduction

Surveys were administered with 8 junior medical officers, working in the emergency department at North-east Health Wangaratta, in June 2014. The aim of the surveys were:

- to understand the process of conducting a telehealth consultation – from the existence of guidelines, training, support from senior doctors.
- to identify any difficulties faced when carrying out a consultation via telehealth.
- to understand the perceptions of the medical officers in regard to the telehealth services being provided to the ED patients in the hospital.

A thematic analysis of the data is presented below. This is followed by conclusions and recommendations.

Background Information on the Junior Medical Officers

Please refer to Table 15 as a point of reference. 7 out of 8 medical officers were employed on a full time basis (1 doctor was part time). Of the four participants that chose to answer the question on their work title, 3 were hospital medical officers (HMOs), 1 a locum HMO and the other an ED HMO. 1 participant was an ED resident. 4 of the 8 participants had between 2 and 5 years work experience. 7 out of 8 participants were in their 20s. 1 participant was 50. 5 participants were male and 3 participants female. When asked how many weeks, months or years the participants had worked in the Emergency Department, 4 participants had worked for 24 weeks, 2 between 30 and 32 weeks, 1 for 12 weeks and 1 for 1 week.

When asked whether the participant had used telehealth at Northeast Health Wangaratta, 3 participants had used it once, and 5 participants had used it between 3 and 6 times. When asked how recently they had used telehealth, 5 had used it months ago, 2 had used it weeks ago and 1 had used it days ago. No participant, when given the opportunity to use telehealth, refused the offer.

Table 15: Basic Information on Junior Medical Officers (JMOs)

ID Number	Employment Status	Work Title	Work Experience (years)	Age	Gender	Work Duration	Times telehealth used	Most recent use
1	Part Time	No response	No response	50s	Male	32 weeks	6	weeks ago
2	Full Time	HMO	2	20's	Female	24 weeks	4	days ago
3	Full Time	No response	No response	20's	Male	30 weeks	3	weeks ago
4	Full Time	ED Resident	3	20's	Male	24 weeks	1	months ago
5	Full Time	Locum HMO	2	20's	Male	1 weeks	4 or 5	months ago
6	Full Time	ED HMO	1.5	20's	Female	12 weeks	1	months ago
7	Full Time	No response	No response	20's	Female	24 weeks	1	2 months
8	Full Time	No response	No response	20's	Male	24 weeks	5 - I have used it many times when I worked as a nurse in WA	Several months ago - Jan 2014

Thematic Analysis of Data

The survey questions revolved around 4 themes:

Effectiveness: Care/intervention/action provided is relevant to the client's needs and based on established standards. Care, intervention or action achieves desired outcome.

Accessibility: People can obtain healthcare at the right place, at the right time irrespective of incomes, physical location and cultural backgrounds.

Continuity of care: Ability to provide uninterrupted coordinated care or service across programs, practitioners, organisations and levels over time.

Responsiveness: Healthcare service is patient oriented. The client is treated with dignity, confidentiality and encouraged to participate in choices related to their care.

Effectiveness

Only if the clinician was confident in using telehealth could he or she provide care that achieved the desired outcomes. The data around effectiveness could be divided into two categories: factors that influenced the confidence and in turn use of telehealth by the clinicians, and the confidence that clinicians had in the staff at the referral site. The data for each is presented below.

JMOs confidence in using telehealth

1. Confidence before and after initial telehealth consultation
2. Factors that influence confidence in using telehealth
3. Stress related to using telehealth
4. Factors that make using telehealth harder than face to face consultations
5. Factors that have an effect on clinician’s capacity to treat.

JMOs confidence in competence of referral staff

1. Confidence in referral staff following clinical instructions
2. Support provided by referral staff
3. Clinical information of patient communicated clearly to referral staff

Confidence before and after first consultation

Participants were asked to rate their confidence level before and after their initial telehealth consultation. The ratings are provided in **Table 12** below. The comments made by participants are also provided.

Table 16: JMOs confidence levels before and after first telehealth consultation

Participant ID	Confidence before first telehealth consultation	Confidence after first telehealth consultation	Comments
1	5	8	
2	3	1	
3	8	8	
4	0	8	
5	5	9	
6	3	6	
7	5	5	“still 5. My concern would be if it was a patient with an abdominal lump for example I would not be confident using telehealth. Nurses may not be trained in feeling lumps.”
8	1 to 2	1 to 2	“This is because the patients weren’t ideal for telehealth. It would be much easier if it was a sporting injury for example. A lot of patients would not stay in Corryong as they would need further treatment.”

Based on 16, it could not be stated that the level of confidence had increased, decreased or stayed the same before and after the clinicians’ initial consultation. The results were quite varied. 4 out of 8 clinicians stated that their confidence level increased, 1 clinician stated that his/her confidence level decreased, while 3 clinicians stated that their confidence levels did not change. 2 of these 3 clinicians provided reasons for the lack of change as the type of condition treated via telehealth. In addition to this question, participants were asked to identify factors that affected their confidence levels when using telehealth. Most of the responses revolved around the difficulties in conducting a physical examination:

“I feel very uncomfortable not being able to examine patients over telehealth, instructing patients or nursing staff to help with the examination is very time consuming and inconsistent. I feel confident using telehealth because I feel I understand its significant limitations.” [P2]

“Concerns I may miss something on examination I would have seen/felt in person which could affect management.” [P7]

“Mainly with regards to physical examination of patient, I’m generally happy with general inspection of patient. I can do that easily with visual and auditory things available through telehealth but when it comes to listening to the heart or specific things.. if there is a specific diagnosis which would be elicited by a physical examination and you have staff at the other end that are not trained in physical examinations then that is a limitation. I don’t think there is any way to overcome that except if there is a doctor on the other end.” [P8]

One participant commented on the competence of the healthcare professionals at the referring site.

“The success of the consultation was strongly affected by the competence of the referring health practitioner.” [P6]

Based on the comments made by participants, their rating depended on the type of patient’s and cases that were presented via telehealth.

Factors that make using telehealth harder than face to face consultations

When participants were asked to identify factors that made telehealth consultations harder than face-to-face consultations, the responses were similar to the factors that affected their confidence in using telehealth, that is, their inability to perform physical examinations.

“The fact that there are no doctors available at the hospital makes it more difficult to make certain decisions. In the ED, one can observe or treat the patient and be able to act if there is deterioration but that is not the case in those hospital so early transfer to a larger hospital might be organised when this would may not have been necessary.” [P1]

“History taking – is very time consuming with the audio delay. Examination – not able to listen to a chest, feel and abdomen or get a good view of a cellulitic leg unless the patient is able to move it close to the camera.” [P2]

“Examination. Not hands on treatment. Unable to observe the effects of medications.”[P3]

“I was unable to perform meaningful examination apart from basic observation. This system relies heavily on the referring practitioner’s ability to convey physical examination findings. There were also problems with mis-triaging of patients who needed to have been seen very early by a medical practitioner who was treated as “non-urgent” and referred for a telehealth conference 2 hours after presentation. Also I am unable to perform procedures across a screen.”[P5]

Two participants expressed concern over the lack of interaction with the patient that hindered them for making a clinical assessment based on the patient’s walking, dressing style and the way they acted.

“Communicating with the patient. You don’t get to see the way the patient walks, how they dress, how they are acting. All of these things inform your clinical assessment. You had often made many judgments even before they sit down. You can’t do that through telehealth.” [P8]

“Difficulty assessing sick patients over telecommunication system. No actual human interaction.”[P6]

Stress related to using telehealth

Participants were asked whether they felt stressed when using the after-hours care telehealth system to treat patients. 5 participants disagreed, 1 participant strongly disagreed and 2 participants agreed. One participant, who agreed that he/she was stressed when using telehealth, chose to provide a more detailed response:

“yeah quite stressed as you are putting your name on the paperwork. You have very limited information coming to you - this makes it a lot harder.” [P7]

Factors that had an effect on the clinician's capacity to treat via telehealth

Participants were asked to identify factors that affected their capacity to treat using telehealth. The responses were mainly around three themes: guidelines for telehealth consultations and training and support and clinicians' confidence in the referral staff.

Each of these are explored in turn below.

Guidelines for telehealth consultation

Clinicians were asked whether there were a set of guidelines for setting up a telehealth consultation and undertaking a telehealth consultation. Participants chose from the following options: true, false, not sure. 2 participants chose to provide an open ended response. The results are provided in **Table 17** below.

Table 17: JMOs perceptions on guidelines for setting up and undertaking telehealth consultation

Participant ID	Guidelines for setting up telehealth consultation (True, False, Not sure)	Guidelines for undertaking telehealth consultation (True, False, Not sure)
1	True	Not sure
2	True	Not sure - knowing the nurses on the other end of the telehealth helps as they have the confidence to tell me their clinical opinion. It takes a couple of attempts before you really get a handle on the limitations and how best to approach a telehealth consult. Starting with proper introductions including people not seen on the camera, getting the story from the nurse, taking the history and then asking the nurse what she wants. The last bit is very important as sometimes they are calling with a patient they already feel they do not have the capacity to manage or someone they are very comfortable with and just need a drug order. Understanding what the nurse and patient want out of the telehealth consult helps reach an appropriate outcome.
3	True	True
4	True	True
5	False	False
6	Not sure	False
7	True	True
8	False	True - there was something written but telehealth takes a long time. It's not like in actual ED where you can start a consult and multi task with other patients. So to actually follow the problem when you are on night duty is not really ideal as you have a lot of patients waiting.

As seen in **Table 17**, there was no common perception amongst the clinician in regards to the existence of guidelines for setting up and undertaking a telehealth consultation. This indicated that there was not a clear understanding as to whether these guidelines were in existence. Based on the open ended comments, short, precise guidelines were considered important.

Training and other support

Participants were asked whether any training was provided on how to use the telehealth equipment and how to undertake a telehealth consultation. In addition to this, participants were asked whether support was provided in the form of a senior doctor supervising their first telehealth consultation. The results for these queries are summarised in **Table 18** below.

Table 18: JMOs perceptions on provision of training and other support

Participant ID	Training on using telehealth equipment (True, False, Not sure)	Training on undertaking telehealth consultation (True, False, Not sure)	Content provided during training	Senior Doctor Supervision (Yes, No)
1	True	True	Purpose of telehealth. Way to use the hardware and software. Hospital staff involved.	No
2	False	False		No
3	True	False		No
4	True	True		No
5	False	False		No. I was the most senior doctor at that time.
6	False	False		No
7	False	False		No. this is because it happens overnight when there are only junior doctors on, that is 10pm-5am. The junior doctors are second or third years, not interns.
8	False - no training in Wangaratta but I have had training in my former role as a nurse and medical student in WA	False, but yes in WA when working as a nurse. Did a little bit of telehealth as a medical student at Notre Dame. I did training on how to setup etc. with another nurse. No training in physical exam. It would very useful to have standardised protocol in physical exam. In my experience here it was really hard to get the people at the other end to do what you wanted them to do. I had a girl in premature labour I wanted them to do a VE. Patient couldn't communicate as she was in labour.		No

As seen, most of the participants (with the exception of 2 of them) had not received any formal training on how to use the telehealth equipment and undertake a telehealth consultation. One participant [P8] had training in a previous role and based on that experience, expressed the need for protocols around physical examinations of telehealth patients. No participant was provided with support from a senior doctor. One participant [P7] stated that this was because telehealth consultation occurred overnight when junior doctors were on duty.

JMOs Confidence in Competence of Referral Staff

Apart from the data mentioned previously in regard to the competence of the staff at the referral site, clinicians were specifically asked questions around this issue. Three questions could be categorised under this theme: Referral staff undertaking clinical instructions provided by clinician, support provided by referral staff and clear communication of patient clinical information by staff at referral site.

The data for each of the above will be presented in this section. Participants were asked to rate their confidence level in referral staff undertaking the clinical instructions, clinicians' perceptions in regard to the support provided by referral staff and whether clinical information about the patient was communicated appropriately to the clinician. The findings are summarised in **Table 19** below.

Table 19: JMOs perceptions on support provided by referral staff

Participant ID	Referral staff undertaking instructions	Referral staff support	Comments on referral staff support	Clinical information communicated clearly by referral staff
1	10	10	Excellent	Strongly Agree
2	7	10	No response	Agree
3	8	8	Staff have been very supportive	Strongly Agree
4	5	10	Happy	Disagree
5	5	5	This is highly variable between different referring sites. Some of them give good clinical support, others don't.	Agree
6	9	9	I feel they provided very good support	Agree
7	8	10	I think they provided good support. I asked them to put in a cannula + give fluid + also trial oral fluid as this patient had gastro if there were any problems to call back overnight.	Strongly Agree
8	3 to 4	2	The staff were stressed out (premature labour patient). Hard to get them to do much. This is frustrating. It is because of the situation. It is hard to take charge when you are behind a TV screen. There is no presence	Disagree - what would be ideal is a fully synthesised history plus examination plus impression. Difficult to get a history and examination that is ordered and focused to what you want.

The ratings for referral staff undertaking clinical instructions and the support they provided were almost similar, that is, if the clinician felt that the referral staff followed clinical instructions quite well, then they also felt that the support being provided was appropriate. There is also a correlation between these two factors and whether or not the clinical information was communicated clearly to the clinician with the exception of one participant [P5], who was pleased with the first two factors but not happy with the way clinical information was communicated. Based on the comments, clinicians were reasonably pleased with the care provided to the patient by the referral staff, with the exception of certain patient cases.

Accessibility, Continuity of Care and Responsiveness

Participants were also asked whether accessibility, continuity of care and responsiveness had any effect on their capacity to treat patients. These three terms are defined again below:

- Accessibility: People can obtain healthcare at the right place, at the right time irrespective of incomes, physical location and cultural backgrounds.
- Continuity of care: Ability to provide uninterrupted coordinated care or service across programs, practitioners, organisations and levels over time.
- Responsiveness: Healthcare service is patient oriented. The client is treated with dignity, confidentiality and encouraged to participate in choices related to their care.

Accessibility (JMOs results)

Participants were asked whether the following had any influence on their capacity to treat patients; Aboriginal or Torres Strait Islander descent, non- English speaking background and age of patients seeking care. With the exception of 1 participant [P8] who had treated Aboriginal patients in Western Australia (made no difference using telehealth), no other participant had the opportunity to treat this cohort of people using telehealth. In regard to patients from a non-English speaking background, no participant had an opportunity to treat patients in this group. One participant said:

“I have not had the opportunity to treat this group. It would be difficult though less chance of telehealth being good with no body language and interpreter. [P8]

With respect to the age of the patient, 6 participants said that this factor had not influence their capacity to treat patients. 2 patients however, said that it influenced their capacity to provide care:

“Yes. As a general rule, I am not happy to treat people at the extremes of age (i.e. babies and the elderly) over telehealth as the implications of a wrong diagnosis are severe. I also have less confidence in making decisions for babies/children unless I can personally perform physical examinations on them as the value of history taking in this group is very limited.” [P5]

“Yes - patient was young (30). That could have been a positive as they are used to technology.”[P7]

Continuity of Care (JMOs results)

Participants were asked about the provision of uninterrupted, coordinated care. The responses to 6 queries can be categorised under the following themes:

Receipt of clinical documentation in a timely manner from referral hospital

1. Prescribing medication at consulting hospital via telehealth
2. Completion of paperwork for referral hospital
3. Follow up with the General Practitioner (GP)
4. Letter sent to GP after the telehealth consultation
5. Technology capability

Receipt of clinical documentation in a timely manner from referral hospital

Participants were asked whether they received clinical documentation about the patient, in a timely manner from the referral hospital. 2 participants strongly agreed, 4 participants agreed, 1 participant provided no response and 1 participant [P8] stated that he/she received a fax on one occasion but not another. One participant [P7] who strongly agreed, also provided a detailed response:

“Strongly agree - it’s actually quite easy for the doctor if the paperwork comes through. We have pre made packs - I just couldn’t find them on my occasion.” [P7]

Prescribing medication at consulting hospital via telehealth

Participants had to choose whether they felt that prescribing medication during/after a telehealth consultation was similar to face-to-face consultations. 3 participants strongly agreed, 2 participants agreed, a participant neither agreed nor disagreed, 1 participant disagreed and 1 participant provided no response. One participant [P7] who agreed and the participant that disagreed [P8] provided a more detailed response:

“Agree - gastro in my case so gave Ondansetron and IV fluids which is what I would do. I could not see the mucus membranes but I got a good feel from the history and observations which would guide how much fluids to give. I shouldn't say strongly agree because you don't have the capacity to actually see the mucus membranes. I faxed across the drug chart to the referring hospital.” [P7]

“Disagree - don't have all the information you would normally have. Without all the information, it is hard to know where you are going. Pain relief and fluid is easy. Never afraid to give pain relief.” [P8]

Completion of paperwork for referral hospital

Participants had to state whether they were able to complete the paperwork for the referral hospital in a timely manner. 3 participants strongly agreed, 3 agreed, 1 disagreed and 1 participant provided no response. 1 participant who strongly agreed [P7] and 1 participant who disagreed [P8] provided more detailed responses:

“Strongly agree- I fax my notes to the referring hospital”. [P7]

“Disagree - feel that I am lacking a lot of information to complete paperwork. I feel like I'm missing case information, patient information and some of the story. This is both a problem with the information sent and with the examination/consultation.” [P8]

Follow up with the General Practitioner

Participants were asked whether they advised the patient to follow up their treatment with their General Practitioner. Out of a total of 8 response, 7 participants stated that they always advised their patient to seek further advice and treatment from their GP. 1 participant [P2] stated that this only occurred “sometimes”.

Letter sent to GP after telehealth consultation

Participants were also asked whether they sent a letter to the respective GP after the telehealth consultation. 4 participants stated that they have never done this, 2 participants had done this sometimes, and 2 participants had always sent a letter to the GP. 2 participants who had never sent a letter to the GP [P7, P8], chose to provide a more detailed response:

“Never - I think this was an administration error though. I wasn't aware of the protocol and the normal paperwork - I didn't know where it was. In this case, the referring nurse said she would handover to morning doctor. I rang that doctor in the morning.” [P7]

“Never because the patient was being sent for further treatment. If not transferred I would send a letter.” [P8]

Technology capability

Participants were asked certain technology related questions around connecting to the internet for a telehealth consultation, and when connected, the clarity of vision and sound. 2 participants chose not to provide open ended responses. The results are provided in **Table 20** below.

Table 20: JMOs perceptions on technology capability

Participant ID	Connecting to Internet straightforward (always, most of the time, occasionally, never)	Clarity of vision (very good, good, poor, very poor)	Clarity of audio (very good, good, poor, very poor)	Other comments
1	Most of the time	Very good	Very good	
2	Most of the time	Good	Good	The sound has a significant delay which makes history taking difficult, physical examination is very difficult particularly if you do not know the nursing staff on the other end.
3	Always	Very good	Good	Simple to use, convenient tool and suitable for patients who are well and needed some form of advice.
4	Most of the time	Very good	Very Good	
5	Most of the time	Very good	Good	No issue with sound or vision, the system was very good for what it is intended to.
6	Most of the time	Good	Very Good	Vision could be improved by appropriate lights. Bright lights caused a bit of glare. Strong light made the patient a bit glary- harder to see the rash she had.
7	Always	Very good	Very Good	No issues at all.
8	Always plus there was always someone to help.	Good	Good	You could make improvements. Some of the other facilities I worked at had multiple screen that is observation screens, also could see patients from multiple angles. We can't see any electronic results we just have what is faxed through.

The capability and capacity of the technology was considered quite good by the participants. Connecting to the Internet was quite simple, and the audio and video quality were mostly very good or good. But, some participants identified some issues with sound delay, bright lighting and the need for multiple observation screens.

Responsiveness (JMOs results)

Participants were asked to rate the extent to which the patients were treated with dignity and respect during the telehealth consultation, whether their privacy and confidentiality was maintained and lastly, whether they were able to make decisions and choices about the care they were provided. These ratings are provided in **Table 21**.

Table 21: JMOs perceptions on responsiveness of care

ID	Dignity and Respect/10	Privacy and Confidentiality/10	Decisions and choices about care/10
1	9	9	9
2	10	7	5
3	7	8	8
4	10	10	10
5	10	9	7
6	6	8	9
7	5 because I don't know what the nurses are doing to preserve privacy. I cannot be sure what is happening there. I am in control face to face, I tell the patient how much to undress etc.	5 I don't know how secure the physical environment is on the other side. Example, my patient was in a day stay ward and they may have had to speak a bit louder. I don't know how many other patients were there. I think telehealth consultations ideally should be in a private space. I think it would help if when you introduce yourself as a telehealth doctor, you ask the patient if they have enough privacy.	8-9 this question depends on the case however if they were very sick maybe no choice.
8	5-6 pretty similar to normal	5-6 no different to normal. EDs are never ideal.	2-3 not much difference but in face to face probably a bit better. So much of the decision making is between the telehealth doctor and referral nurse.

The ratings for each aspect were similar in nature. That is, those clinicians that felt the patient was treated with dignity and respect, felt that their privacy and confidentiality respected and they were given the option of choosing and deciding their care. Based on the comments made, most clinicians had not felt there was a difference in these three aspects between telehealth consultations and face-to-face consultations.

Other Comments (made by JMOs)

Participants were asked to provide any other comments or thoughts they had about telehealth in general. 5 out of 8 participants chose to provide open ended responses. They fall under three key themes:

1. Telehealth and accessibility to healthcare services
2. Requirement for training
3. Video/audio issues

The quotes for each are provided below.

Telehealth and accessibility to healthcare services

“Very good and it is a very good system for outlying hospitals with minimal resources.” [P1]

“I think the system as it is now works very well. This is a very valuable addition to the rural health service. The ability to see patient is a valuable addition to my decision making process. However, the problem lies in the fact that some of the clinical judgement relies on the referring practitioner’s skills, which can be variable. [P5]

Requirement for training

“Orientation to the telehealth system would have been great, but I started in ED on nights and it was a challenge but possible to work out with the help of the nurse in charge. You have less time to make decisions, I have now learnt that sometimes it’s okay to give them some management plan, hang up, get further advice and talk again particularly overnight. I found it very difficult to telehealth with Corryong as a patient had been seen on telehealth on the Saturday, reviewed in Wodonga, sent home and represented for the telehealth in which I participated, this was difficult as I was unable to get the records from Wodonga and therefore was less able to manage the patient in the referral hospital. Once you know the limitation of the system it is easier to work with.” [P2]

Visual/audio Issues

“My telehealth was a very visual problem (rash), I feel I’d have been more confident with a patient with not so visual symptoms (cough/headache/etc), just due to not having to diagnose by mainly sight and feel”. [P6]

“Early on, one of my colleagues was frustrated because of the sound delay. It was a complex patient, morbidly obese, it was hard to examine. They must have had the patient up against the wall as they couldn’t walk around the patient. The problem was compounded by auditory delay. I have not had this problem.” [P7]

Appendix D: Survey Data Analysis

Senior Doctors

Introduction

Surveys were administered with 4 senior doctors, who had either used telehealth or assisted junior doctors with using telehealth, between January 2014 and April 2015. The aim of the survey was:

- to understand the doctor’s experience with the telehealth service.
- To understand whether telehealth has made a difference to the way the doctors treated patients in the after-hours emergency department.
- To identify any issues with the telehealth consultation.

A thematic analysis of the data is presented below.

Background Information on Senior Doctors

Participants were asked to provide their gender and age. One participant was female and the rest male. The majority of participants were aged between 51 and 60 years. This information is summarised in **Table 22**. Participants were then asked to provide the location of their healthcare service. All participants were based in Wangaratta.

Table 22: Age range of senior doctors

Age range	Number of participants
51-60	3
61-70	1
TOTAL	4

As seen in **Table 23**, most participants have been employed as clinicians between 20 and 40 years. The majority of participants (3 in total) had worked in their current hospital for between 1 and 10 years. Participants were also asked whether they worked full time or part time. 3 participants worked part time and 1 worked full time.

Table 23: Senior doctors’ length of employment/service in current hospital

Length of Employment/ service in current hospital	1 – 10 years	11-20 years	21-30 years	31 to 40 years	TOTAL
Number of years of employment	0	0	2	2	4
Length of service at current hospital	3	1	0	0	4

All participants always worked in the Urgent Care Centre and all participants worked the day, afternoon, weekdays and weekend shifts (please note that some participants had selected multiple options in regard to the type of shift). 3 participants (1 provided no response) were responsible for supervising junior doctors in the Emergency Department.

Table 24: Senior doctors’ frequency of work in UCC and type of shift

Type of shift	Number of participants
Day shift	4
Afternoon shift	4
Night shift	0
Weekdays	4
Weekends	4
TOTAL	16

All participants had used telehealth. Participants were then asked questions that specifically addressed the frequency of use of the telehealth system. As seen in **Table 25**, most participants had used telehealth between 1 and 5 times (3 in total), a few weeks ago (3 in total).

Table 25: Senior doctors' frequency of use and recent use of telehealth system

Frequency of use of telehealth system	Number of participants
1 to 5 times	3
6 to 10 times	1
TOTAL	4
Recent use of telehealth	Number of participants
A few weeks ago	3
Several months ago	1
TOTAL	4

Basic information on telehealth consultation (senior doctors results)

Participants were asked to describe the scenarios for which telehealth was used. Apart from this, they were asked to describe situations that they believed worked best for after-hours telehealth, and clinical situations where it had not worked well. Within the descriptive text below in **Table 26**, there is a discussion around the data regarding the appropriateness of telehealth for medication orders and prescriptions.

Table 26: Senior doctors – clinical scenarios for which telehealth was used

Body system where problem occurred	Description of problem
Urinary System	Urinary Tract Infection
Digestive System	Abdomen pain
Nervous system	Headache Psychological treatment
Skeletal system	Analgesia for fracture Emergency Dental Care (2)
Respiratory system	Chest pain (2)
Integumentary system	A moderate allergic reaction to an insect bite, requiring oral Phenergan and prednisolone
Other (could affect multiple body systems)	Paracetamol overdose

A range of issues had been treated via telehealth, including chest pain, abdomen pain, and allergic reactions. Below are comments that participants made in regard to the best clinical situations to use telehealth, and situations where this technology was not appropriate to provide clinical support. As can be seen, telehealth is suitable in scenarios where the nurse was confident about the situation, most of the information about the patient could be collected through history taking, or patients could be treated with oral medication or could wait till a follow up the following day. It was inappropriate for patients who may have a mental illness such as dementia. One participant (P3) commented about an instance when he/she requested a transfer of the patient which ended up being the correct decision.

Table 27: Senior doctors perceptions on the appropriateness of telehealth to treat various clinical scenarios

ID	Clinical scenarios where telehealth was appropriate
1	Where the nurse feels confident she knows what is happening, A simple problem needing prescribing single treatment.
2	Scenarios where one can get most of the information through the history taking. Examining patients via telehealth is not easy.
3	I will deal whatever is presented to me.
4	Haemodynamically stable patients in category 4 and 5 who can be treated with oral medications, or receive adequate first aid and analgesia to enable them to wait for review in person by the next available doctor.
ID	Clinical situations when after-hours Telehealth was inappropriate
1	No response.
2	When patients can't give a good history eg: dementia. When examination of the patient is important in formulating the diagnosis
3	None, had an unusual presentation that caused me to request patient to present to Wangaratta and that was correct decision. Prevented ambulance transfer being needed
4	I am not aware of any.

Telehealth also seemed to be appropriate when prescriptions for certain medications were required or needed to be administered (for example, analgesia). On this note, when participants were asked how often they use the telehealth service for the primary purpose of obtaining a medication order or prescription for the patient, 3 participants stated that they used it sometimes, and 1 participant said that it was used quite often. So, telehealth seems to be appropriate for situations where the condition is not too complicated and treatment can be administered easily. Participants also stated that telehealth was not used for purposes other than providing after-hours care in the Urgent Care Centre.

Thematic Analysis of Data

The survey questions revolved around 4 themes:

Effectiveness: Care/intervention/action provided is relevant to the client's needs and based on established standards. Care, intervention or action achieves desired outcome.

Accessibility: People can obtain healthcare at the right place, at the right time irrespective of incomes, physical location and cultural backgrounds.

Continuity of care: Ability to provide uninterrupted coordinated care or service across programs, practitioners, organisations and levels over time.

Responsiveness: Healthcare service is patient oriented. The client is treated with dignity, confidentiality and encouraged to participate in choices related to their care.

These themes will be used to analyse the rest of the data.

Effectiveness (senior doctors results)

Only if the clinician is confident in using telehealth can he or she provide care that achieves the desired outcomes. The data around effectiveness can be divided into two categories: factors that influence the confidence and in turn use of telehealth by the clinicians, and the confidence that clinicians have in the staff at the referral site. The data for each is presented below.

Both of these aspects can influence the effectiveness of care provided to the patient:

Senior doctors' confidence in using telehealth

1. Stress related to using telehealth
2. Factors that have an effect on clinician's capacity to treat.
3. Clinician's confidence in assisting with physical examination and making clinical decisions.

Senior doctors' confidence in competence of junior doctors

1. Confidence in instructions provided by the doctors

These factors are discussed in turn below.

Stress related to using telehealth

Participants were asked to rate their stress levels when it came to using telehealth, that is, whether they felt stressed or not. All participants disagreed, that is none of them felt stressed when it came to using telehealth.

Factors that affected the clinician's capacity to treat

Participants were asked whether they had guidelines for choosing suitable patients for a telehealth consultation, guidelines for setting up telehealth equipment and lastly guidelines regarding the paperwork required for the telehealth consult.

Table 28: Senior doctors' perceptions on existence of guidelines

Guidelines	Choosing suitable patients	Setting up equipment	Paperwork
Strongly disagree	0	0	0
Disagree	1	0	0
Neither disagree nor agree	1	1	0
Agree	2	2	3
Strongly agree	0	1	1

The majority of participants agreed that there were guidelines in place when it came to choosing suitable patients for a telehealth consultation, setting up the telehealth equipment and paperwork required for the consultation.

Participants were also required to comment on whether they received education and training regarding telehealth consultations. All participants had received education and training. Participants were also asked whether this prepared them for undertaking a teleconsultation. 3 participants agreed and 1 participant strongly agreed. No participant felt that they needed further education.

Confidence in assistance provided with physical examinations (senior doctors)

Participants were asked about their confidence levels in regard to the assistance provided with physical examinations, making clinical decisions and confidence that the nurses were following their clinical directives. They were asked to provide comments in relation to difficulties faced in assisting with physical examinations, their confidence in regard to the instructions provided by the doctors (0 = no confidence – 100= total confidence). These findings are summarised below.

Table 29: Senior doctors levels of confidence

Confidence	60%-70%	71-80%	80%-90%	91%-100%	TOTAL
Confidence in assistance provided with physical examination	0	0	2	2	4
Confidence in making clinical decisions	0	0	2	2	4
Confidence in nurses following instructions	0	0	3	1	4
Confidence in junior doctors making clinical decisions	2	1	1	0	4

The majority of participants were quite confident (80%-100%) with the assistance provided by the nurses in regard to conducting physical examinations. The same could be said in regard to making clinical decisions and the nurses following instructions given by the doctors. When participants were asked whether they had encountered difficulties in assisting with physical examinations, 3 said no and one said yes:

“If patient has tonsillitis, it is very hard to check their throat. Difficult to assess abscesses etc. Trauma patients especially the elderly”. [P2]

Based on the comment, it was difficult to manipulate the camera to focus into someone’s throat and also clearly visualise certain conditions such as abscesses. It was also difficult to examine a patient in trauma, particularly an elderly patient. This could be due to the severity of the condition or the patient’s anxiety and stress.

In regard to their confidence levels in junior doctors making decisions, the rating ranged between 60% and 80%. 3 participants were responsible for providing training to the junior doctors about using telehealth, and of these 3, 2 sometimes used the training material while one never used the training material.

Accessibility, Continuity of Care and Responsiveness

Participants were also asked whether accessibility, continuity of care and responsiveness had any effect on their capacity to treat patients. These three terms are defined again below:

- **Accessibility:** People can obtain healthcare at the right place, at the right time irrespective of incomes, physical location and cultural backgrounds.
- **Continuity of care:** Ability to provide uninterrupted coordinated care or service across programs, practitioners, organisations and levels over time.
- **Responsiveness:** Healthcare service is patient oriented. The client is treated with dignity, confidentiality and encouraged to participate in choices related to their care.

The relevant data has been discussed under each of these themes.

Accessibility (senior doctors results)

Part of accessing telehealth was being aware of its existence. Participants were asked whether the community was aware of telehealth and willing to use the service. 2 participants disagreed and 2 participants stated that they did not know.

Participants were then asked whether certain factors had a positive or negative impact on a patient's access to healthcare. The factors were very elderly, very young, people who identified as Aboriginal or Torres Strait Islanders, or belonging to a Culturally and Linguistically Diverse (CALD) group. The participants felt that none of these factors influenced the patient's access to the telehealth service.

Being able to access care at the right place at the right time meant that a patient should be able to get care required without the need to travel to another hospital. On this note, participants were asked how important after-hours telehealth had been in regards to reducing the number of ambulance transfers and private car transfers. All participants felt that telehealth was important in reducing ambulance and private car transfers.

Continuity of Care (senior doctors results)

Participants were asked about the provision of uninterrupted, coordinated care. A few aspects can be discussed under this theme:

1. Technology Capability
2. Provision of care plan and paperwork after the telehealth consultation
3. Follow up with the General Practitioner (GP) and sending a letter about telehealth consultation to the GP.

Each of these will be discussed below.

Technology Capability

Part of providing uninterrupted care was the capability of the technology, that is, the quality of the connection, visual and sound. These three aspects had to be good for the telehealth consultation to be successful.

Table 30: Senior doctors' perceptions on technology capability

Technology Capability	Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree	TOTAL
Connection quality	0	0	0	1	3	4
Vision was consistently good	0	0	0	2	2	4
Sound was consistently good	0	0	0	4	0	0

Most participants agreed or strongly agreed that the connection quality, vision and sound was reasonably good. Some comments about these aspects are provided below.

"The delay is disconcerting and took a few consults to get used to." [P1]

"At my level. I rarely use guidelines. Only when things aren't working." [P3]

Based on these comments, the quality of the sound and visual was reasonably good, but the delay in communication was of concern. But, this was less of an issue as the use of telehealth increased. The comment made by participant P3 highlighted that guidelines were referred to on occasions that the technology had not worked.

Clinical history communication and sending of paperwork

Continuity of care was also dependent on the process following the telehealth consultation. Participants were asked whether the patient's clinical history was communicated clearly by the nurses and whether the paperwork was sent to the participant on time.

Table 31: Senior doctors' perceptions on provision of care plan and paperwork following teleconsultation

Clinical history and paperwork	Always	Mostly	Never	TOTAL
Clinical history communicated clearly	3	1	0	4
Paperwork sent in timely manner by doctor	2	2	0	4

Most participants felt that the clinical history and paperwork was always or mostly communicated on time, and sent in a timely manner. So, there seemed to be a reasonably good communication process in place, with minimum time delays.

Follow up with the General Practitioner (GP) and sending a letter about telehealth consultation to the GP

Part of continuity of care was whether the patient was advised to have a follow up with their General Practitioner (GP) and whether a letter was sent to the GP following the teleconsultation. This ensured that the local doctors were aware of the patient's treatment and condition, should there be any further issues.

Table 32: Senior doctors' perceptions on follow up and communication with General Practitioner

Follow up with GP	Always	Sometimes	Never	Not Sure	TOTAL
GP follow up	3	1	0	0	4
Letter sent to GP	1	0	2	1	4

The doctors always advised the patient to follow up with their GP, however a letter was not always sent to the GP. This could be of concern as the GP is the first point of contact if the health issue continued.

Overall, in regard to continuity of care, the technology seemed to be working quite well, but there was a need for more training on how to position the cameras and understanding the limitations of the technology. The clinical history was communicated clearly and the paperwork sent in a timely manner which meant that uninterrupted care could be provided.

Responsiveness (senior doctors results)

It was important that patients be treated with dignity and respect, their privacy be respected and that they were allowed to make choices and decisions about their care. Participants were asked to rate the extent to which patients were treated well (rating all three aspects mentioned above).

Table 33: Senior doctors' perceptions on responsiveness of care

Responsiveness	80%-90%	91%-100%	TOTAL
Dignity and respect	3	1	4
Privacy	3	1	4
Allowed to make decisions about car	3	1	4

Most participants felt that patients were treated with dignity and respect, their privacy maintained and they were allowed to make decisions and choices about their care (between 80% and 100%).

Participants were also asked whether they were treated with dignity and respect when communicating with the telehealth team in the outlying Urgent Care Centres (UCCs). Participants were between 90% and 100% certain that they were treated with dignity and respect. So, overall, participants felt that patients were treated quite well by the telehealth team in regard to maintaining their dignity and respect, privacy and allowing them to make decisions and choices about the care they received. The participants also felt that they, as clinicians, were respected by the telehealth team at the Urgent Care Centres (UCCs).

Other Comments (made by senior doctors)

Finally, participants were asked to provide some feedback in regard to telehealth increasing the workload in the health service’s emergency department, whether it was working well at the health service and whether it is a sustainable initiative.

Table 34: Senior doctors’ perceptions on workload and telehealth sustainability

Increase in workload	Number of participants
20-30%	2
31-40%	1
Above 40%	1
TOTAL	4
Telehealth working well at health service	
Agree	4
TOTAL	4
Telehealth sustainable at health service	
Strongly agree	1
Agree	3

As seen above, the participants felt that there was a slight increase in workload (between 20 to 30% increase). Only one participant stated that there was a 75% increase in workload. But, this may be due to the participant’s existing commitments. Most participants agreed that telehealth was working well and was a sustainable service.

Participants were asked to provide further comments on the telehealth service:

“I’m a senior, I don’t tend to use guidelines”. [P1]

“I think this very good for a selected group of patients, everything should be done to ensure continuation of the project”. [P2]

“We need to find a way of documenting the phone fax consults that are now occurring. Part of growth of telehealth.” [P3]

Based on the comments, telehealth seemed to be working quite well, without the support of guidelines. Teleconsultations were good for certain patients. One participant suggested that the phone and fax consultations should be documented for the future. This may be easy to do with copies of faxes and recording of phone calls retained and transcribed. But, this was considered additional administrative work.

Appendix E: Focus Group Analysis

Yarrowonga Nurses and Corryong Nurses

Introduction

A focus group was held with 6 Emergency Department (ED) nurses from the Yarrowonga hospital, in February 2014. A similar focus group was held with 8 Emergency Department (ED) nurses from the Corryong hospital, in June 2014. The aims of these focus groups were twofold:

- to understand the perceptions of these nurses in regard to the telehealth service being provided for ED patients in the hospital. Participants were asked to freely discuss their thoughts about the telehealth service.
- Any problems that were highlighted with the telehealth service were then resolved by the team at Northeast Wangaratta.

An analysis of the data from the focus group in Yarrowonga is first presented. This is followed by a discussion of the data from the Corryong focus group. The data from both hospitals is then compared, followed by the conclusion and recommendations.

Background Information on the Nurses in Yarrowonga

All 6 nurses were registered nurses, division 1 working in the emergency department at Yarrowonga Hospital. 1 nurse had less than 10 years of experience (5 years), 5 out of 6 nurses had more than 10 years of experience, and 4 out of the 6 nurses had 15 years or more of experience. Some nurses had not used telehealth at all, whilst others had used it a few times. Specifically, 3 nurses had never used telehealth, 1 nurse had used it 3 times, 1 nurse 10 times and the other more than 10 times.

Thematic Analysis of Data

The discussion in the focus groups was mainly around three aspects:

1. Patients: Nurses discussed patients' access to services (accessibility). This, of course, was discussed from the perspectives and observations of nurses rather than the patients themselves. There was also some discussion around the nurses access to the telehealth service.
2. Challenges faced by nurses in obtaining advice and help from General Practitioners or the doctors on call at the hospital. This in turn, affects the patient's ability to receive treatment (continuity of care, responsiveness).
3. Challenges faced with telehealth (continuity of care).

The three themes, bracketed above, are based on the Australian Institute of Health and Welfare (AIHW), health performance indicators (2009). They can be defined as follows:

- Accessibility: People can obtain healthcare at the right place, at the right time irrespective of incomes, physical location and cultural backgrounds.
- Continuity of care: Ability to provide uninterrupted coordinated care or service across programs, practitioners, organisations and levels over time.
- Responsiveness: Healthcare service is patient oriented. The client is treated with dignity, confidentiality and encouraged to participate in choices related to their care.

The data from the focus groups will be analysed under each of these themes.

Accessibility (Yarrowonga nurses)

Being able to obtain healthcare at the right place and time depended on whether patients were aware of the existence of the relevant services. In regard to telehealth, the nurses felt that only few in the Yarrowonga community were aware of the existence of telehealth. The service was described in the local newspaper, which was not read by all. Else, the community found out through word of mouth or ambulance drivers. When a patient refused to be transported by ambulance to Northeast Health Wangaratta, (due to issues such as distance from home), they were informed by the ambulance driver, of the telehealth service in the local hospital.

Most patients were happy to use telehealth when a doctor was unable to see them. No one who had been offered this as an alternative had refused and no one had negative feedback after using the telehealth service. For a patient, it was important that they get advice when they needed it (an example provided was a mother with a child suffering from Croup). For some patients, they felt it a privilege to be seen on screen by the doctors.

So, overall, nurses perceived patients as being comfortable with using telehealth as an alternative to face-to-face treatment. Access to care at the right place and right time was important for the patients. Also, from the nurses' perspective, they felt that having access to telehealth services was useful as a backup for further advice and reassurance.

Continuity of Care & Responsiveness (Yarrowonga nurses)

In order to provide uninterrupted care, the nurses should be able to seek advice from the local General Practitioners (GPs), and request that they visit the patient at the hospital. There were two practices in Yarrowonga, and GP assistance was available till 11pm. GPs attended to category 1,2 and 3 cases. Anything beyond category 3 would be referred to Northeast Wangaratta via telehealth. But, there were some issues with convincing GPs to come to the hospital and see the patient. Some would refuse to see a category 3 patient. It was the nurse's responsibility to refer these patients to the GP. This issue could cause delays and interruptions in the provision of treatment of the patient.

If a category 3 patient, was experiencing severe pain and symptoms, the nurse would contact Northeast Wangaratta via phone, rather than telehealth, which was explicitly meant for category 4 and 5 patients. This was noted as an issue by the researchers running the focus group. Changes to the Memorandum of Understanding were to be made to include category 3 patients. This change could enable more patients to be provided care via telehealth.

In regard to responsiveness of care, it was not only important that the patient be treated with dignity and respect during the teleconsultation, but that the nurses looking after this patient received the same treatment. One of the nurses commented that some doctors in Wangaratta were quite rude and condescending. A nurse gave an example of a patient who couldn't void but had no urinary track issues. The doctor on duty at Yarrowonga advised the use of a catheter, without really listening to the nurses clinical judgment. It is unclear from the data as to whether this conversation took place during the teleconsultation, in front of the patient.

On a positive note, the nurses also discussed an incident where the doctor spoke directly with the patient (via telehealth), making him/her the focus of the conversation.

Continuity of Care provided via telehealth (Yarrowonga nurses)

The nurses discussed issues with documentation and receiving updated documents, after a telehealth consultation. They were not always received on time. These documents contained medication orders, so it was important for the nurses to receive this document as soon as the telehealth consultation was complete.

Focus Group Analysis – Corryong Nurses

Background Information on the Nurses in Corryong

Of the 8 nurses, 5 nurses were Division 1 nurses, and 3 were Division 2 nurses, working in the emergency department at Corryong Hospital. The Division 2 nurses all had more than 10 years of experience in the emergency department, and the Division 1 nurses had less than 5 years of experience. 4 of the division 1 nurses had used the telehealth system.

Thematic Analysis of Data

As with the Yarrowonga focus group analysis, the data will be analysed under three key themes: accessibility, continuity of care and responsiveness. The questions that were asked during the focus group were very similar in nature to the Yarrowonga focus group. Therefore, the results of both focus groups will be compared and discussed at the end of this analysis.

Accessibility (Corryong nurses)

Being able to obtain healthcare at the right place and time depends on whether patients were aware of the existence of the relevant services. There was no advertising of the telehealth service. The nurses felt patients perceived this as another health service, as remote on call doctoring had been used for the past 4 years in the hospital. So patients were accustomed to going to the hospital at times when no doctors were available and alternate services had to be used.

At times, patients had been a bit confused, but had agreed to use the telehealth service. Feedback so far, was positive. In the past, nurses had to call the doctors on the phone and they would then speak with the patient. Now, the patient was able to interact via a big screen, with a camera that could zoom in and zoom out. Most patients, especially mothers of younger children were very happy with the service and older patients found that it is quite unique, and they were able to establish better rapport with the doctor as they were able to see them and talk to them.

The nurses also discussed patients preferring telehealth to travelling further to seek care. Patients had the option of travelling to Wodonga for further advice/treatments, but when a patient was injured, the time lost in travelling as well as waiting times, could be of great concern. The type of transportation (a utility vehicle may not be appropriate), used for this commuting as well as the time (night travel can be more dangerous), were expressed as primary concerns by the nurses. In addition to these issues, accommodation, meals and ambulance services (if required), could be additional costs for the patients. Telehealth could be a good alternative in these circumstances.

Nurses, overall felt that the after-hours telehealth service was good as they were able to get expert advice at a distance. Being quite isolated and not having doctors available at all times, had meant that this service helped in emergency situations and providing reassurance to the nurses.

Continuity of Care and Responsiveness (Corryong nurses)

Uninterrupted care could only be provided if the nurses were able to seek advice from the doctors when required. There were no comments on the General Practitioner's involvement in care, but nurses commented on the service provided by the staff at Wangaratta. They felt that the staff were very approachable, but found that using telehealth could affect the interaction between the doctor and the patient as both parties had to get used to the system. In terms of technical support, they found that the staff at Wangaratta provided timely support and any issues were resolved on Fridays when the nurses at Corryong checked the telehealth services.

In regard to telehealth, and the building of a trusting relationship between the doctor in Wangaratta and the nurses at Corryong, a comment was made about the difference in building a rapport with doctors at Corryong, who the nurses work closely with and trust, and the difficulty of building this rapport with a doctor in Wangaratta who did not know the nurse or their skill set and experience. There was a need to build a relationship for the benefit of the patient.

Continuity of Care provided through telehealth (Corryong nurses)

When the nurses were asked to comment on the guidelines for telehealth consultations, they were aware of a flowchart or process to follow. There was a requirement for them to scan and email the relevant documents to Wangaratta. But nurses had to then inform Wangaratta that they documents had been scanned and sent through, which was quite a time consuming process especially when a patient was in a lot of pain and required immediate care. Scanning documents had also meant that the nurse was away from the patient for a period of time, which was a concern.

At times, the doctors at Wangaratta had taken longer to send the medication orders and other documents to the nurses (at times, up to 24 to 48 hours). This needed to be a timely process, as delays could cause adverse events.

Comparative analysis between Corryong and Yarrawonga

A comparative analysis of the data from both focus groups is provided below. As seen, the analysis is done under the three key themes.

Accessibility

Overall, the nurses at both hospitals, felt that telehealth had been helpful for themselves as well as the patients. In Corryong, telehealth was perceived as an alternative healthcare service, in a remote area where minimum doctors were available. This was quite different to Yarrawonga where most patients were not aware of the service and advertising either through newspapers, or word of mouth was important. Patients, in both cases, were happy to use the service and found that being able to see the doctor whilst speaking with them was novel and enhanced the interaction between these two parties.

Nurses, in both hospitals, felt reassured by the availability of expert advice.

Continuity of Care and Responsiveness

The nurses at Yarrawonga commented more about the General Practitioners, whereas the nurses at Corryong did not have anything to say about GPs involvement in telehealth. In regard to the doctors at Wangaratta, there was some negative feedback from the nurses in Yarrawonga. They felt that the doctors were at times, rude and condescending. This was different to the perception held by the nurses at Corryong who felt that the doctors were quite responsive and respectful.

The nurses at Yarrawonga and Corryong expressed concern around building a trusting relationship with the doctors over a short period of time. The nurses at Corryong also felt that building rapport with the doctor via telehealth could be difficult as both the nurse and doctor had to get used to the system.

Continuity of Care provided via telehealth

In both Yarrawonga and Corryong, there was concern expressed at delays in the doctors in Wangaratta sending documentation to the nurses in a timely manner. Although there was a clear process in place at Corryong, nurses felt that scanning and emailing documents, followed by a phone call to inform Wangaratta that the documents have been sent, was a time consuming process. They felt that this took them away from the patient.

Appendix F: Survey Data Analysis

Nurses

Introduction

Surveys were administered with 28 nurses, who had used telehealth in the participating Small Rural Health Centres, between January 2014 and April 2015. The aim of the survey was:

- to understand the nurse's experience with the telehealth service.
- To understand whether telehealth had made a difference to the way the nurses treated patients in the after-hours emergency department.
- To identify any issues with the telehealth consultation.

A thematic analysis of the data is presented below. Please note that a total of 73 responses to the online survey were received. Of these, 14 participants had not used telehealth and could therefore not complete the survey. 31 participants had not completed the survey (as indicated by the software, Redcap). This left a total of 28 completed surveys, the results of which are described below.

Background Information on Nurses that were surveyed

Participants were asked to provide their gender and age. All participants were female. The majority of participants were aged between 61 and 70 years (8 in total). This information is summarised below .

Table 35: Age range of surveyed nurses

Age range	Number of participants
21-30	3
31-40	4
41-50	5
51-60	7
61-70	8
TOTAL	27 (1 participant provided no response)

Participants were then asked to provide the location of their healthcare service. The majority of participants were either based in Corryong or Yarrawonga (7 participants at each location). This data is summarised in **Table 36** below.

Table 36: Location of healthcare service where nurses worked

Location of healthcare service	Number of participants
Cobram	1
Myrtleford	1
Alexandra	2
Numurkah	2
Beechworth	3
Benalla	5
Corryong	7
Yarrawonga	7
TOTAL	28

Following this, participants were asked about their length of their employment and length of time they had worked at their current hospital. As seen in **Table 37**, most participants had been in the field of nursing for anytime between 31 and 40 years (12 in total). 16 participants had been employed in the current hospital for anytime between 1 and 10 years. Participants were also asked whether they worked full time or part time. 5 participants worked full time and 23 worked part time.

Table 37: Length of employment of nurses/service in current hospital

Length of Employment/ service in current hospital	1 – 10 years	11-20 years	21-30 years	31 to 40 years	41 to 50 years	TOTAL
Number of years of employment	5	5	1	12	5	28
Length of service at current hospital	16	2	5	5	0	28

As summarised in **Table 38**, the majority of participants always worked in the Urgent Care Centre and most participants worked during the afternoon and night shifts (please note that some participants had selected multiple options in regard to the type of shift).

Table 38: Nurses' frequency of work in UCC and type of shift

Frequency of work in Urgent Care Centre	Number of participants
Always	14
Frequently	11
Occasionally	3
TOTAL	28
Type of shift	Number of participants
Day shift	15
Afternoon shift	21
Night shift	21
Weekdays	17
Weekends	17
TOTAL	91

Participants were then asked questions that specifically addressed the frequency of use of the telehealth system. As seen in **Table 39**, most participants had used the system anytime between 1 and 5 times and most participants had use the system several months ago. As mentioned earlier, 14 participants had never used the telehealth system. 12 participants had not been on duty when a suitable patient presented after-hours. 1 participant stated that a patient was suitable but refused telehealth. 1 participant had not undertaken training on how to use telehealth. These 14 nurses were based in the following areas: 1 from Beechworth, 1 from Mount Beauty, 1 from Benalla, 2 from Numurkah and 3 from Myrtleford.

Table 39: Nurses' frequency and recent use of telehealth system

Frequency of use of telehealth system	Number of participants
1 to 5 times	14
6 to 10 times	9
11 to 20 times	3
21 to 30 times	1
TOTAL	28
Recent use of telehealth	Number of participants
Today	2
A few days ago	5
A few weeks ago	9
Several months ago	10
More than one year ago	2
TOTAL	28

Basic information on telehealth consultation (nurses)

Participants were asked to describe the scenarios for which telehealth was used (Table 40 below). Apart from this, they were asked to describe situations that they believed worked best for after-hours telehealth and clinical situations where it hadn't worked well. Within the descriptive text below, there is a discussion around the data regarding the appropriateness of telehealth for medication orders and prescriptions.

Table 40: Reason for teleconsultation as stated by nurses

Body system where problem occurred	Description of problem
Urinary System	Urinary Tract Infection (5) Renal colic
Digestive System	Nausea and/or vomiting (11) Abdominal pain/reflux (11)
Nervous System	Febrile child (2) Child with fever Dizziness Hypertension Migraine/headache (6)
Reproductive System	Pregnant with PV bleeding Pregnant woman with uncomplicated hyperemesis responding to anti emetic and IV fluids
Respiratory System	Croup (4) Upper Respiratory Tract Infection (URTI) (2) Asthma Atrial fibrillation Chest pain Cough epistaxis (nose bleed) infant with shortness of breath
Lymphatic System	Tonsilitis child with parotitis
Skeletal System	Back pain (4) Chronic pain (2) Toothache/tooth abscess(6) Fractured clavicle
Integumentary System	Lacerations to hand from chain saw Rashes, boils and allergies (8) Infant's rash
Other (could affect multiple body systems)	Drink spiking Swelling Function decline

A range of issues had been treated via telehealth. Children and infants had also received care. Below, in **Table 41**, are comments that participants made in regard to the best clinical situations to use telehealth, and situations where this technology may not be appropriate to provide clinical support. Based on the data, telehealth was appropriate for treating less complicated conditions, such as urinary tract infections, headaches, that had not required complex procedures to be undertaken. Telehealth was also perceived to be appropriate for non-urgent conditions, but as pointed out by one participant, experience was important. Although the participant had not delved into detail, it could be understood from the quote that the referral nurse needed to have excellent assessment skills when it came to choosing the appropriate patients for a telehealth consultation. They also needed to be experienced enough to undertake minor procedures upon receiving instructions from the doctor at the consulting hospital.

Telehealth also seemed appropriate when obtaining prescriptions for certain medication or administering pain relief medication. On this note, when participants were asked how often they used the telehealth service for the primary purpose of obtaining a medication order or prescription for the patient, 12 said they often do, 10 said they utilised it sometimes and 6 said they had never utilised it to obtain medication orders or prescriptions. This seemed to be in line with the participants data on the frequency with which the doctor prescribed medication via telehealth. 5 participants stated that they always did so, 13 said they often do, 6 said sometimes and 1 said never. So, telehealth seemed to be an appropriate mode of treatment when medication needed to be ordered or prescribed. Telehealth was considered inappropriate for more critical situations such as a woman in labour, someone suffering from hysteria. Some participants complained that there were a few procedural issues that had not made telehealth inappropriate, but made the referral process more complicated and time consuming. These however could be improved.

Table 41: Situations in which telehealth is appropriate and inappropriate (perceptions of nurses)

Appropriate
<p>Treatment of certain conditions</p> <p>Pain relief</p> <ul style="list-style-type: none"> • “anything that requires a doctor to prescribe treatment- pain relief mainly.” • 7 more participants stated that telehealth is best for patients that require pain management medication. <p>Urinary tract infections</p> <ul style="list-style-type: none"> • Patients presents with something like a UTI, the patient is commenced on oral antibiotics, saving time, money and pain for the patient and the health service. • 4 more participants stated that telehealth is best used for urinary tract infections. <p>Headaches/migraines (2)</p> <p>Nausea/vomiting (3)</p> <p>Treatment of non-urgent conditions</p> <ul style="list-style-type: none"> • Where the condition can be adequately assessed and treated by the doctor via telehealth. • relatively simple, non-complicated events that require some treatment ‘now’ & can then be followed up some 6-8 hrs say (or less) later by the duty doctor. • non urgent presentations where you have time to do a thorough assessment and can wait for a response from the hospital or doctor I have not tried to do telehealth with local doctors as yet, it may be something of the future. • Simple infections, UTI, Migraine, tonsillitis, Triage Cat 4-5. <p>Prescription of certain medication</p> <ul style="list-style-type: none"> • Triage 4 & 5 and sometimes 3 and where the situation is not covered within the Primary Care Case Management (PCCM) &/or as a RIPEN cannot give the recommended medications as not approved by the Drugs & poisons authority as yet • where the patient needs S3 and or S4 medications that aren’t on the Victorian minister for health’s list for Scheduled medicines endorsed RNs (I am one), which can reduce their symptoms/ treat their illness enough for them to go back home & follow up with own GP during business hours <p>Expertise</p> <ul style="list-style-type: none"> • Senior experienced RNs with strong ED experience, excellent assessment skills. Patients with low acuity.
Inappropriate
<p>Clinical case examples where telehealth was inappropriate</p> <ul style="list-style-type: none"> • An elderly patient stable who had sustained a fall - had to transfer them to another hospital after observing them for most of the day, pain relief for children who sustained a fracture- easier to send these children straight to Albury Base Hospital (ABH) - orthopedic clinic. • One patient who was hysterical and could not be pacified enough to interact with the doctor or RN. • One situation when the client had to wait too long and did not stay to complete the consultation. • Abdominal Pain as doctor always wants to examine themselves. Most cat 3’s as although our guidelines state that the referring hospital can treat cat 3’s they are reluctant to do so. • I have had 2 presentations where the outpatient did not want to wait, [during the referral process to telehealth] • I was on duty & not in charge & can’t remember who made the decision to telehealth but the patient was in late stage labour & delivered a baby (a local Dr & midwife had been called). The telehealth was not appropriate at this time. An AV clinician would have been more useful if the aforementioned Dr & midwife were not available. • Any obvious Fracture, lacerations that require suturing, labouring women, chest pain requiring transfer or thrombolysis, dislocated shoulder. • Chest (non cardiac) and abdominal pain, Cat 3. <p>Procedural issues that have made telehealth inappropriate</p> <ul style="list-style-type: none"> • Have not had any issues with the consultation, just the receiving of doctor’s orders, however that is a technical glitch that has been addressed in our facility. • Chart getting misplaced in Wang Staff in Wang denying that I had spoken with them giving them handover (admin or triage) Long waiting time over 2.5 hours It is frustrating when we want an order for nursing home residents - more so if their charts are not up to date prior to the local doctors going off for the weekend. Info that nurses need to get together from Nursing Home and Hostel residents charts is time consuming. The Acute patients have an information form for telehealth already completed which is used for handover to Wang. This needs to be done for all Nursing Home Residents too. • Patient with pain in Residential Care. It took a long time to obtain an order for analgesia. Medical Officer not knowing where Corryong is and where the next regional health service is.

Thematic Analysis of Data

The survey questions revolved around 4 themes:

Effectiveness: Care/intervention/action provided is relevant to the client's needs and based on established standards. Care, intervention or action achieves desired outcome.

Accessibility: People can obtain healthcare at the right place, at the right time irrespective of incomes, physical location and cultural backgrounds.

Continuity of care: Ability to provide uninterrupted coordinated care or service across programs, practitioners, organisations and levels over time.

Responsiveness: Healthcare service is patient oriented. The client is treated with dignity, confidentiality and encouraged to participate in choices related to their care.

These themes will be used to analyse the rest of the data.

Effectiveness (surveyed nurses)

Only if the clinician was confident in using telehealth could he or she provide care that achieved the desired outcomes. The data around effectiveness is on the factors that influenced the confidence and in turn use of telehealth by the nurses. The data for each is presented below.

Nurses' confidence in using telehealth

1. Stress related to using telehealth
2. Factors that have an effect on clinician's capacity to treat.
3. Clinician's confidence in assisting with physical examination, making clinical decisions and confidence in instructions provided by the doctors.

These factors are discussed in turn below.

Stress related to using telehealth

Participants were asked to rate their stress levels when it came to using telehealth, that is, whether they felt stressed or not.

Table 42: Nurses' stress levels in relation to using telehealth

Stress rating	Number of participants
Strongly disagree	4
Disagree	17
Neither disagree nor agree	6
Agree	1
TOTAL	28

Most participants felt that they were not stressed when using telehealth (17 in total).

Factors that have an effect on clinician's capacity to treat

Participants were asked whether there were any factors related to patient's usual GP that impacted on their decision to use telehealth. 26 participants stated that there were no such factors, while 2 participants stated that this was the case. The two participants who felt that there were certain factors, stated the following:

"Only the odd doctor who hadn't/hasn't agreed to use telehealth". [P13]

"Increasing temperature 37.2 on arrival, 38.2 on discharge FWT, ECG, BSL- all NAD. Patient needed further investigations i.e. x-ray, pathology etc." [P18]

In the first instance, the doctor seemed to be hesitant to use telehealth, but the reason was unknown. In the second instance, the patient required further investigations, which may have required the GPs assistance.

Guidelines to choose suitable patients for telehealth

Participants were asked whether they had guidelines for choosing suitable patients for a telehealth consultation, guidelines for setting up telehealth equipment and lastly guidelines regarding the paperwork required for the telehealth consult.

Table 43: Nurses' perceptions on existence of guidelines

Guidelines	Choosing suitable patients	Setting up equipment	Paperwork
Strongly disagree	0	0	0
Disagree	3	1	2
Neither disagree nor agree	2	2	1
Agree	15	18	16
Strongly agree	8	7	9
TOTAL	28	28	28

The majority of participants (15,18,16 in total) agreed that there were guidelines in place when it came to choosing suitable patients for a telehealth consultation, setting up the telehealth equipment and detailing the paperwork required for the consultation.

Participants were also required to comment on whether they received education and training regarding telehealth consultations, whether this prepared them for undertaking such a consultation and whether there was a need for further education initiative.

Table 44: Nurses' perceptions on education and training

Education and training received?	Number of Participants
Yes	25
No	3
TOTAL	28
Education prepared you for undertaking telehealth consult?	Number of Participants
Strongly disagree	1
Disagree	1
Neither disagree nor agree	3
Agree	20
Strongly agree	3
TOTAL	28
Further education required?	Number of Participants
Yes	23
No	5
TOTAL	28
Comments regarding education	
<p>"As I have used the telehealth system infrequently an update/refresher session would be very useful. I think it is an excellent concept for our region." [P7]</p> <p>"how to use system and guidelines of patient suitability." [P14]</p> <p>"what to do about possible problems with use of telehealth." [P23]</p> <p>"preparing patient & positioning patient & feedback on Drs experience." [P26]</p>	

Most participants stated that they had received education and training (25 in total) that prepared them to undertake a telehealth consultation (20 in total). Some felt that further education was required (5 in total). Interesting comments around this were teaching strategies to overcome any issues with telehealth and preparing the patient for the telehealth consultation.

Confidence in assisting with physical examinations, making clinical decisions and confidence in doctor's instructions

Participants were asked about their confidence levels in regard to assisting with physical examinations, making clinical decisions and confidence in doctor's instructions. They were asked to provide comments in relation to difficulties faced in assisting with physical examinations and their confidence in regard to the instructions provided by the doctors. These findings are summarised below.

Table 45: Nurses' levels of confidence

Confidence	<50%	50%-60%	61%-70%	71%-80%	81%-90%	91%-100%	TOTAL
Confidence in assisting with physical examination	1	0	4	4	6	13	28
Confidence in making clinical decisions	0	1	1	6	8	10	26 (2 no responses)
Confidence in doctors' instructions	0	1	2	8	6	11	28

The majority of participants (13,10,11 respectively), were quite confident (91%-100%) in assisting with physical examination, making clinical decisions and the instructions given by the doctors. When participants were asked whether they had encountered difficulties in assisting with physical examinations, 24 said no and 4 said yes:

"Trust or mistrust." [P15]

"Not understanding what the doctor wants, not wanting to interrupt them because of the telehealth setup. Not having an already established working relationship with the doctor so they know your abilities and you know theirs." [P28]

"visualising into a patient's mouth." [P26]

Based on the comments, there seemed to be two themes: one is regard to doctors' trusting the nurses' competency in assisting with the physical examination, and the other, in regard to visualising certain parts of the body such as the mouth. In regard to trust, one participant has pointed out that there is not a working relationship with the doctors – so they are were aware of the nurses' abilities and this made it harder for trust to be built between the two parties.

Not being able to visualise a patient's mouth may be a technical limitation or one that could be resolved with more training.

Participants were also asked to comment on the factors that impacted their confidence in relation to doctor's instructions.

What has worked well?

"Doctors always discuss with patients & nurses regarding treatment". [P1]

"I worked in Wangaratta Ed for 4 days (placement) and have met a lot of the Drs and have seen the set up there and for this reason have a high level of confidence in the Drs there. If the Dr doing the telehealth has a negative body language and or attitude, the experience gives less confidence." [P26]

"So far they have all been Great. Lovely to the patient/ lovely to the nursing staff." [P12]

"Very confident, pleasant manner and thorough assessment to patient, requesting nurse staff to complete pathology FBe, U&E's etc- do not have these services on site." [P18]

Nil to date. (3 participants in total stated this). [P13, P15, P20]

"I have had no worries with the consultation or orders." [P4]

What needs improvement?

"wait time for receiving the written orders on faxed or e-mail -phone orders are much more time efficient/ sometimes have received the wrong patient's details, the doctor's do not know where we are located- 2 hours from Wangaratta - 1.5 hours from Wodonga & 1.40 from Albury." [P2]

"Lack of knowledge where the organisation is situated geographically." [P21]

"I don't think the Drs understand what we do and do not have eg: no bloods." [P6]

"Doctors not being aware of the service the hospital provides eg no Path, xray etc overnight." [P14]

"The telehealth doctor did not even look up from his notes to the screen/patient so it may as well have just been a telephone consultation." [P5]

"Often I get a response just send patient over." [P8]

"Junior Doctors unsure of diagnosis ordering treatment that is 'over the top' eg Adrenaline nebs for child with croup playing on the floor of the UCC." [P10]

"It is always better in person, as they can read the patient's body language better, which can be important." [P24]

"I am only confident with their decision because of my past ED experiences. However I am not 100% confident for junior nursing staff - only because the process relies heavily on Accurate and thorough nursing assessment and experience. This experience extends to triage which many staff need further training and guidance I don't believe also that the doctors can get accurate vision to diagnose rashes, oral cavities, eyes etc nor can they palp or auscultate chests / abdomen." [P28]

As seen, some participants felt quite confident about the instructions given by the doctor. But, this was not the case with all of them. There seemed to be a lack of awareness on the doctor's part in regard to geographic location of the small rural health care centres, and a lack of understanding of the facilities available. This had implications when it came to transfer of patients and ordering certain medical tests overnight. Concern had been raised in regard to the junior doctors as well as junior nurses. A case in which a junior doctor prescribed nebulization for a child with croup who was not that unwell, may have meant that the doctor was being precautious. In regard to junior nurses, concern had been raised about their ability to provide an accurate assessment. They may not have enough experience.

Accessibility, Continuity of Care and Responsiveness

Participants were also asked whether accessibility, continuity of care and responsiveness had any effect on their capacity to treat patients. These three terms are defined again below:

- **Accessibility:** People can obtain healthcare at the right place, at the right time irrespective of incomes, physical location and cultural backgrounds.
- **Continuity of care:** Ability to provide uninterrupted coordinated care or service across programs, practitioners, organisations and levels over time.
- **Responsiveness:** Healthcare service is patient oriented. The client is treated with dignity, confidentiality and encouraged to participate in choices related to their care.

The relevant data has been discussed under each of these themes.

Accessibility (nurses)

Part of accessing telehealth was being aware of its existence. Participants were asked whether the community was aware of telehealth and willing to use the service.

Table 46: Nurses' perceptions on the community awareness of telehealth

Awareness	Strongly disagree	Disagree	Agree	Strongly agree	I don't know
Community aware of telehealth	1	12	11	1	3
Community willing to use telehealth	0	0	23	5	0

Most participants felt that the community was not aware of telehealth (12 in total). In spite of this unawareness, most of the community was willing to use telehealth (23 participants felt that this was the case).

Participants were then asked whether certain factors had a positive or negative impact on a patient's access to healthcare. The factors were very elderly, very young, people who identified as Aboriginal or Torres Strait Islanders, or Culturally and Linguistically Diverse (CALD) group. The findings are summarised in **Table 47**.

Table 47: Nurses' perceptions on the impact of cultural groups on access to telehealth

Cultural group	Yes	Yes	TOTAL
Very elderly	1	1	28
Very young	2	2	28
Aboriginal or Torres Strait Islander descent	0	0	28
Belonging to a CALD group	0	0	28
None of the above	24	24	28

“Elderly do not like waiting too long - over 2 hours they have had enough - usually provide a drink & some form of first aid treatment while we are waiting.”
 None so far (3)
 “2 elderly patients I have used the system with could not understand that there is a person on the TV speaking to them.”

The majority of participants felt that none of these cultural factors impacted the patient’s access to care (24 in total). The participants who chose to comment stated that it was the elderly that had some issues, either with waiting times or not being able to comprehend the fact that there was a person on TV speaking with them.

Participants were also asked about the amount of time the patient had to wait between arrival of the patient at the Urgent Care Centre and referral for telehealth consultation. They were also asked how much time the patient had to wait between referral for a telehealth consultation and being seen by a doctor.

Table 48: Nurses' perceptions on waiting time

Wait time	Lesser than ½ an hour	½ an hour to 1 hour	Between 1 and 2 hours	More than 2 hours	TOTAL
Wait time between arrival and referral	5	18	3	1	27 (1 no response)
Wait time between referral and consultation	0	18	2	4	24 (4 no responses)

Contacting hospital to arrange telehealth consult is simple

Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly Agree	TOTAL
0	4	4	13	6	27 (1 no response)

As can be seen above, the majority of participants stated that patients waited anytime between half an hour to one hour in both instances, that is the time between arrival and referral and time between referral and consultation. The wait time between arrival and referral was in line with the data on whether it was simple to contact the hospital to arrange a telehealth consultation (13 participants agreed).

4 patients had to wait for more than 2 hours (1 patient had to wait for 19 hours) between the referral and consultation with the doctor. The participant described this as “one situation when the client had to wait too long and did not stay to complete the consultation” [P4]. The patient was an unwell child.

Being able to access care at the right place at the right time meant that a patient should be able to get the care required without the need to travel to another hospital. On this note, participants were asked how important after-hours telehealth has been in regards to reducing the number of ambulance transfers and private car transfers.

Table 49: Nurses’ perceptions on the impact of telehealth on patient transfers

Transfers	Very important	Important	Unsure	Makes no difference	TOTAL
Reducing ambulance transfers	4	10	4	10	28

The majority of participants felt that telehealth was either important for reducing ambulance transfers, or made no difference (10 in total for each option). The majority of participants felt it was important for reducing private car transfers (13 in total). Several comments were made in regard to patient transfers:

“Unsure - sometimes an extended wait. Referral hospital occasionally reluctant to accept transfer due to their workload, or not aware of our service & its unavailability of services.” [P1]

“Important - Time waiting for transfers. Many patients do not want transfer to regional health services.” [P8]

“Very important/important - Difficult getting ambulance.” [P6]

“Unsure- telehealth is provided from Wangaratta - they always say send them to our nearest regional hospital, Wodonga or Albury depending on their acruity, so it seems like double handling and a lot of time is duplicated- better since all categories 1,2,& 3 are transferred to regional hospital- ambulance makes this call, our community is becoming accustomed to seeing the doctor during the week.” [P2]

“Important - Patients who are elderly and not keen to go to a regional hospital and want to stay in their own community with the support of their family and friends.” [P3]

“Unsure/very important - Most issues are around ambulance cover as our UCC is not funded and the cost of the ambulance is borne by the client unless they have either private health of Centrelink pensions. In this case some people prefer to discharge themselves and be taken in a private car. Some people come to the UCC instead of calling an ambulance due to having no ambulance cover.” [P4]

Waiting time as well as difficulties in getting ambulances were mentioned in the comments. Some patients preferred to stay in their local community when seeking treatment as they had the support of family and friends, or could not bear the cost of ambulance transfers. So, overall, telehealth was seen as important in reducing transfers, but based on the participant responses, there was some uncertainty around whether or not it had made a significant difference in this regard.

Based on the answers to all the above questions relating to access, participants were asked whether the telehealth service has had an impact on the number of patients attending the Urgent Care Centre for after-hours care. 4 participants stated that patients were more likely to come to the UCC, 5 stated that participants were less likely to come to the UCC, and 18 stated that it has made no difference.

Continuity of Care (nurses)

Participants were asked about the provision of uninterrupted, coordinated care. A few aspects can be discussed under this theme:

- Technology Capability
- Provision of care plan and paperwork after the telehealth consultation
- Follow up with the General Practitioner (GP) and sending a letter about telehealth consultation to the GP.

Technology Capability

Part of providing uninterrupted care was the capability of the technology, that is, the quality of the connection, visual and sound. These three aspects had to be good for the telehealth consultation to be successful.

Table 50: Nurses' perceptions on technology capability

Technology Capability	Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree	TOTAL
Connection quality	0	0	4	17	6	27 (1 missing response)
Vision was consistently good	0	0	0	19	8	27 (1 missing response)
Sound was consistently good	0	0	1	19	8	28 (1 missing response)

As seen in **Table 50**, most participants agreed that the connection quality, vision and sound was good (17,19, 19 participants respectively). Some comments about the vision and sound are provided below.

Visual issues

"Frequently the Dr does not address the patient directly I wonder if this is because the patient does not directly face the screen" [P8]

"Had one occasion when the doctor in Wangaratta could not zoom in on the child's rash / couldn't work out how to do this [whether Wangaratta had a problem or it was Myrtleford who had to make an adjustment. So the Doctor found it difficult to assess the rash.]"[P20]

"Was not able to get the Dr to be able to see inside a patients mouth-had no idea as to how to best achieve this. I am not sure as to where I should stand-should I be seen on screen or just in the background if needed?" [P26]

"I don't believe the telehealth system is able to get close enough vision of wounds, rashes, eye injury, oral cavity" [P28]

Sound issues

“Very occasionally the sound has faded.” [P12]

“One stage we could not really hear the doctor from the television, kind of on and off. Otherwise all is perfect.” [P15]

“Sometimes the sound wasn’t working- had to dial in again. It depends on the experience of the receiving/reviewing Medical Officer (MO)- once I conducted a full examination using this technology- very efficient & impressed by using me to conduct the examination & the MO instructing me & watching & listening to the approaches by the patient.” [P2]

Based on the comments, there was either a limitation with the technology itself or there was a need for more training in regard to zooming in and positioning the camera so that the doctor could view mouth cavities, rashes etc. The doctor not addressing the patient directly could again be the positioning of the camera at the hospital end, or the doctor not communicating in an appropriate manner with the patient (more education required either way). In regard to sound, there seemed to have been minimum issues, but one participant [P2] raised a good point. The overall quality of the telehealth consultation depended on the experience of the doctor reviewing the case. If the doctor could instruct the nurse correctly, and understood what could and could not be done with the technology, the telehealth consultation could go quite well.

Provision of care plan and paperwork after the telehealth consultation

Continuity of care was also dependent on the process following the telehealth consultation. Participants were asked whether the clinical care plan was communicated clearly and, the paperwork sent in a timely manner by the doctor.

Table 51: Nurses’ perceptions on provision of care plan and paperwork following teleconsultation

Care plan and paperwork following consultation	Always	Mostly	Never	TOTAL
Clinical care plan communicated clearly	20	8	0	28
Paperwork sent in timely manner by doctor	10	16	2	28

As seen in **Table 51**, the majority of participants felt that the clinical plan was communicated clearly (28 in total), and most participants felt that the paperwork was sent in a timely manner by the doctor (16 in total). So, there seemed to be a reasonably good communication process in place.

Follow up with the General Practitioner (GP) and sending a letter about telehealth consultation to the GP

Part of continuity of care was whether the patient routinely followed up with their General Practitioner (GP) and whether a letter was sent to the GP following the teleconsultation. This would ensure that the local doctors were aware of the patient’s treatment and condition, should there be any further issues.

Table 52: Follow up and communication with General Practitioner

Follow up with GP	Always	Sometimes	Never	Not Sure	TOTAL
GP follow up	4	12	0	12	28
Letter sent to GP	3	5	6	14	28

As seen in **Table 52**, most participants stated that patients sometimes followed up with their GPs, while others were unsure (12 total in each category). Most participants were also not sure as to whether a letter was sent to a GP after the consultation.

Overall, in regard to continuity of care, the technology seemed to be working quite well, but there seems to be a need for more training on how to position the cameras and understanding the limitations of the technology. The communication process between the doctor and nurses when it came to the care plan and sending paperwork seemed to be relatively good. But, the lack of knowledge on whether the GP had been sent a letter in regard to the patient’s telehealth consultation and treatment was a concern since it is the GP that is the first point of contact if the health issue should aggravate.

Responsiveness

It was important that patients be treated with dignity and respect, their privacy be respected and that they were allowed to make choices and decisions about their care. Participants were asked to rate the extent to which patients were treated well (rating all three aspects mentioned above).

Table 53: Nurses’ perceptions on responsiveness

Responsiveness	<70%	70%-80%	81%-90%	91%-100%	TOTAL
Dignity and respect	0	5	4	19	28
Privacy	0	5	6	13	24 (4 no responses)
Allowed to make decisions about care	3	7	5	10	25 (3 no responses)

As can be seen in **Table 53**, the majority of participants felt that the patient was completely (91%-100%) treated with dignity and respect, their privacy was protected and they were allowed to make decisions and choices about their care (19,13,10 respectively).

Participants were also asked whether they were treated with dignity and respect when communicating with the telehealth team at the regional health service.

Table 54: Nurses’ treated with dignity and respect by telehealth team

% rating for participants being treated with dignity and respect	Number of participants
<70%	4
70%-80%	6
81%-90%	3
91%-100%	13
TOTAL	26 (2 no responses)

As can be seen in **Table 54**, most participants felt that they were treated with dignity and respect by the telehealth team (13 in total).

So, overall, participants felt that patients were treated quite well by the doctors in regard to maintaining their dignity and respect, privacy and allowing them to make decisions and choices about the care they received. The participants also felt that they, as clinicians, were respected by the rest of the telehealth team (junior doctors, clerical staff).

Other Comments (made by nurses)

Finally, participants were asked to provide some feedback in regard to telehealth improving their capacity to provide high quality care and whether telehealth has been successful at their hospital.

Table 55: Nurses’ perceptions on capacity to provide high quality care and success of telehealth

Provision of high quality care and success of telehealth	Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree	TOTAL
Improved capacity to provide high quality care	1	1	5	17	4	28
Success of telehealth	1	4	3	13	6	27 (1 no response)

As can be seen above, the majority of participants felt that they were able to provide better care (17 in total) as a result of using telehealth and felt that it is a successful initiative (13 in total).

Finally, participants were asked to provide any further feedback on telehealth:

The positives of the telehealth service

“The telehealth has been very positive, the reception staff through to the doctor are very pleasant and cooperative. It is a very worthwhile service with great potential for further uses in health care. Telehealth is a great innovation in health for rural consumers given in many instances they would need to drive 30 - 45 minutes for attention in an ED at one of the tertiary facilities - this way they can be managed at their local facility in their home town. It is wonderful and patients are very grateful and provide positive feedback.” [P3]

"Telehealth is a great service provided free of charge to local people and many folk passing through Benalla. The public think it's great there is no charge to them." [P12]

"An excellent tool for dealing with patients & their complaints during the designated hours, when very often here, they are not urgent. Thank you" [P13]

"The times I have used the system have worked well for me." [P16]

More Community Awareness

"I believe that the local population needs to be educated about the availability of the system so that they are aware that they do not have to travel to the nearest regional centre but can be properly assessed by the staff here and by doctors via telehealth" [P4]

More utilisation by staff

"With each presentation I have gained in proficiency & confidence in using the system. I feel it could be used more though staff are reluctant due to inexperience with system. The old way of phoning a doctor gets quicker response, but not good for the on call LMO". [P1]

"I don't think that many staff have used the telehealth, maybe they have not had the need to use it, I am not sure [in the hospital where I work in Myrtleford]" [P20]

"Only been utilised once. I don't believe it is useful for us here [Alexandra]" [P5]

Administrative procedures need improvement

"Communicating the same information to the clerical assistant , then to the triage person, then communicating to the doctor seems very repetitive at times. I must say e-mailing the information is time consuming & frustrating at times- much easier to fax & talk on the phone. I always ring after I have sent the information to make sure that it is received. I ring to say that we have received the wrong person's details - say someone from Corrowa or Yarrawonga instead of Corryong, we all have to be very diligent in reviewing the correct information in a timely manner. Making sure all staff have their regular breaks & coffee & meal breaks is very important, being respectful & courteous at all times is essential." [P2]

"Mostly using the telehealth has been a positive experience. I have had patients waiting too long for a consult and have left. I found out that the staff had forgotten to notify the triage nurse or have put the form in the wrong place." [P11]

"The administration tasks are sometimes difficult and sometimes the admin person at Wangaratta Ed is not helpful, having our scanner a long way away from our desk is difficult. The forms ask for times to be put on them for things that have not happened yet. The order that things are to be done in has been clarified since some initial problems" [P26]

Further guidelines and support in the form of staffing

"Need clear guidelines from North East Health regarding the acceptance of cat 3. Confusion remains which is causing frustration with staff and GP's." [P8]

"Cat 3's are an issue as the referring hospital does not want to deal with them and our own doctors believe they should only be woken for cat 1 or 2's. As the doctors dealing with the telehealth do not know the nursing staff and are unaware of our experience they are not always keen to listen to our assessment therefore insisting on a transfer so that they can assess, examine and treat the patient." [P10]

"I have had great experiences with telehealth however not all staff have. Staff at the telehealth hospital need to be aware that we are a small hospital and nursing staff are working alone and independently. We don't have back up- telehealth is our back up so support, stupid questions, advice and friendliness should be encouraged and supported. We all need to work as a team. I am aware that on busy nights a telehealth referral is difficult but it's hard to manage patients in a hospital without a Dr, or second opinion. We make a lot of difficult decisions and telehealth is a great way to help support us in this." [P6]

“The Nursing or admin staff who answer the phone are often unfamiliar with the telehealth process, so take a long time to sort out what they are doing. It seems a very long wait time to have a consultation with the patient, the clients often don't wait and leave to get themselves to Wodonga to be seen quicker. They think if they are the only persons in UCC they should get seen quicker. Initiation of treatment takes a long time from a medical perspective, we could give a dose of Maxalon for example before they have the consultation. We have to wait a long time for those sort of orders. Pain relief, antiemetics, salbutamol could be given straight away but instead we have to wait until the Doctor rings us back with an order which could take 2-3 hours. The patients are getting impatient because it looks like we are not 'doing anything' to help them.” [P27]

“Staffing needs to increase when the service is on due to the increase workload of staff when the extended nursing assessment is done and the paperwork to send to NHW ED via scanning, ringing etc. It may fill a gap in service but to the detriment of the local community in that many still have to travel for treatment and elderly residents that would not have to be transferred are sent to ABH - with a hx dementia etc. The system needs good experienced RNS to make it work to assess patients fully, be confident to discuss with NHW Drs in a collaborative manner for the benefit of the pt. Experienced ED RNS can make a plan for a patient from the time they are triaged as they already know the process of treatment they will go through; if the process here relies only on novice RNs the system is not safe. As RNS are truly the only patient advocate in this rural and remote setting” [P28]

Based on the comments, some participants could see the benefits of telehealth but there seemed to be room for improvement. The community needed to be educated about telehealth so that they were made aware of this service and therefore, felt more comfortable using the service in the after-hours. However, this was not possible if the nurses at the hospital were hesitant to use it. This may partly be due to the long waiting times, additional workload for the nursing staff in regard to paperwork, and lack of technical support.

Appendix G: Interview Analysis

General Practitioners

Introduction

Phone interviews were conducted with 9 General Practitioners from the rural areas where telehealth had been implemented. These interviews were conducted between April and May 2015. The aim of the interview was:

- To understand whether telehealth had made a difference to the number of after-hours calls taken by General Practitioners, thereby improving their productivity during the day.
- To understand whether telehealth was a sustainable initiative.

A semi-structured questionnaire was used for the interviews.

Background information on General Practitioners (GPs)

The location in which each participant was based in provided in **Table 56**.

Table 56: Location of GP clinical practices

Location	Number of participants
Yarrawonga	2 [P1, P2]
Corryong	1 [P3]
Benalla	1 [P4]
Myrtleford	1 [P5]
Bright	1 [P6]
Beechworth	1 [P7]
Cobram	1 [P8]
Numurkah	1 [P9]
TOTAL	9

With the exception of Yarrawonga and Benalla, each region had one clinic or practice.

Thematic Analysis of Data

The main theme for this efficiency and sustainability:

Efficiency and sustainability: achieving desired results with the most cost effective use of resources.
Capacity of system to sustain workforce and infrastructure, to innovate and respond to emerging needs.

Efficiency and Sustainability

Participants were firstly asked about their patients. Specifically, how many patients, over the past 1 year, (who have come for a follow up), had used telehealth for after-hours care. This would provide an understanding of whether telehealth had been used within the community.

Table 57: GPs perceptions on number of patients seen through telehealth

ID	Number of patients, over the past year who have used telehealth
1	About 3 patients. In the whole practice – usually about 1 person a night. 4-5 patients a night rock up to hospital anytime after-hours and the nurses fax details to all of us and request an appointment (upto 8 patients can be seen first thing in the morning for a follow up). But, that's a different form of telehealth and a service we have initiated. Any patient who comes to me for follow up as instructed by hospital, I am aware of. I don't know about patients transferred to Wang. If this is a large number, then system is not as efficient.
2	Can't give you an exact number, but have had plenty of patients following up.
3	About 1 patient a month
4	I wouldn't know
5	Can't think of one who used telehealth. Get a discharge letter from Wangaratta but not obvious to me.
6	None
7	In Beechworth, on call system shared some weekends with Wangaratta practices. Every second weekend, we share with Wangaratta practice. Only time telehealth is used is on those weekends. Hospital may use it for cat 4 and 5. But not used when there is a doctor on call.
8	Not many – nurses not using it. We've had between 6 and 8 calls since telehealth introduced. One nurse likes using it. For cat 4 and 5 patients there are various difficulties. Some patients don't want to wait till ED doctor speaks with them. Some nurses don't want to fax requests – extra chore for them. Not for cat 4 and 5, it's for really sick patients that we need help like cat 3's. There are places where it would be more useful. So, patients who use it loves it and nurse loves as she like being part of this interesting process. The nurse who uses it – it's her baby. Only 6 to 8 instances when telehealth has been used to called Wangaratta since implementation.
9	Not that I can remember. In the whole practice, maybe 1 or 2. Not very often.

As seen in **Table 57**, the responses were quite varied. Some GPs were unaware as the patient may not come for a follow up, the GP may not receive a letter stating that the patient had a telehealth consultation, or the patient may choose not to share this information with the GP. The patients and nurses based in Yarrawonga seem to have made most use of it (P1 and P2). In some instances (P7, P8), telehealth was not used very often. In Beechworth, it was only used every second weekend, when the practices shared on call hours with a Wangaratta practice. Therefore, it was not used the majority of times and therefore, doctors were still on call for after-hours care. In Cobram, the nurses were hesitant to use the technology, with the exception of one nurse. The nurses preferred to call the doctor than wait for a teleconsultation. Participants were asked about the amount of time they spent on after-hour calls, before and after the implementation of telehealth.

Table 58: GPs perceptions on changes in time committed to after-hours calls

ID	Time spent on after-hours care before telehealth	Time spent on after-hours care after telehealth
1	On call was initially 3-4 weekends, per month	Now down to 2-3 weekends per month.. and there are more doctors in town. We use telehealth between 11pm and 7am as the first option. Because of after-hours, people were leaving. Now, doctors are staying back. We would have gone down to 3 GPs if not for telehealth. We now have 12 GPs in town.
2	If we have an after-hours roster with 10 doctors in it, 1 in 10 weekends working.. 1 or 2 patients with GP and 1 or 2 with telehealth, it is saving me half an hour every 10 days. I have to qualify that by saying that half an hour is in the middle of night. After I get to bed, I spend 2 hours awake which is a personal cost.. that is why we want change. Bigger hospitals doctors work shift.. we work all day 9 hour shifts in clinic and then for next 14 hours on call.. even if we don't get a call, we carry some degree of burden as we are not free.	Still on call, but relieved of some of the attendances, say about 1 or 2 attendances.
3	1 in 3 weeknights, 1 in 4 weekends.	hasn't changed
4	1 weekend in 6 or 7, 1 day a week	Unchanged.. just that after-hours telehealth stops me from going to the hospital for minor issues.. rather than wake us up they get the telehealth connected at Wangaratta. You do find that you are not disturbed as much.
5	1 in 4 on call, probably 1 in 12 over the weekend.	Still got the same roster in place, telehealth hasn't changed this but we made a decision that the doctors here would be the first contact.. it is less common circumstances where telehealth is used.
6	1 day a week 16 hours a week and 4 hours every 6 weeks, 20 hours.	No change
7	Not a great deal of after-hours. Only do a night once a month on weeknights.	No difference. Spoken to other doctors in my practice who do more on call, not made a difference.
8	Once a week during the week, a weekend a month.	Stayed the same. Hasn't made a difference, if we had the ability to use it would be very useful but it hasn't made a difference.
9	1 night a weekend, 1 weekend a month.	This hasn't changed

Telehealth had made quite a difference to some clinicians but not to others. It was Yarrowonga again, where some difference had been mentioned. For instance, one participant (P1) had commented that telehealth had made such a difference to retaining doctors in the region. Many doctors were leaving due to the increasing burden of after-hours calls, but since telehealth, many had decided to stay back. The other participant from Yarrowonga (P2) stated that telehealth had certainly reduced the number of attendances at hospital, which had meant that the he/she has been able to get a good night's sleep and be more productive the next day. A similar comment had been made by another participant (P4). Although his/her on call times had not changed, telehealth had reduced the need to go to the hospital for minor issues. The other participants, however, stated that telehealth had not made a difference (6 in total). This seemed to be related to reasons such as the decision for the doctors to be the first point of contact and minimum calls after-hours even before telehealth was implemented.

Another part of efficiency and sustainability was understanding whether the treatment provided to the patient was appropriate. If it was not, it could mean an increase in follow ups with the General Practitioners, transfers to regional hospital or need to be hospitalised.

Table 59: GPs perceptions on the appropriateness of treatment via telehealth

ID	Was treatment appropriate?
1	Yes.. all good. I've never had any negative feedback.
2	Yes and patients have been happy.
3	Yes, there haven't been issues
4	Yes, and patients are happy as they haven't woken us up, but had an effective consultation.
5	Off the top of my head I couldn't comment.
6	Appropriate, but length of time is a concern. When nurses ring up Wangaratta, lots of paperwork, then fire up machine and then put it a queue.. easier to have assessment through phone calls. We were concerned that telehealth project used in Wangaratta would encourage nurses to not think for themselves and depend on doctors. We have trained nurses to be independent clinicians, have policies and procedures so doctors needn't get involved. Telehelth project would allow nurse to default to calling doctors due to stand up doctors at night. We felt that telehealth funding would fall out and nurses would have lost all their skills and the workload would increase for doctors. So doctors wanted their own telehealth consultation rather than having Wang involved. The Telecart can be used to connect to GPs but this service is unreliable. It is faster via phone – usually drug needed in the morning.. for example, at 1am a couple of weeks back there was an agitated patient threatening suicide.. the patient needed Valium following a psychiatric check up. I was woken up to authorise Valium tablets. Could have used telehealth, but it is a minor issue. Verbal authorisation.. having telecart wouldn't have made a difference. Telecart would have taken 2 hours to take the order with patient who was unwell. Doctor awake for 2 hours after and this is tiring but nurses don't understand.. telecart good for seeing patients with lacerations and cuts. Perhaps we should replicate the model from Yarrowonga where it is compulsory to use cart from 11am to 7am. We were not keen to use this model.. nurses might lose skills.. but we still getting night calls. So may change model. Technology making work more cumbersome because the hospital can't call Wangaratta via the phone and get telephone order for drugs.. only through telehealth. So 2 hour delay.
7	I can't answer that. It is used minimally because most of local people wouldn't present with minor complaints.. normally nurses would phone us.
8	Nobody has said to me that they've had a telehealth consult. We haven't had any issues, but I don't have any facts in this regard.
9	I don't know
*Telecart is the system that is used at the regional hospital (with reference to the comments made by P6).	

As can be seen in **Table 59**, most participants felt that the treatment given via telehealth was appropriate (5 in total). 4 participants did not know or could not provide a comment. One participant (P6) stated that although the treatment was appropriate, the process of getting a telehealth consultation was time consuming and it was faster to get advice via the phone, especially for minor issues such as a drug order. They were also hesitant to encourage the adoption of telehealth as there was a fear that the nurses would begin to take advantage of this service and forget their clinical competencies. There was an expectation that nurses be able to treat the patients and call upon the doctors, whether it be the local doctors or doctors at Wangaratta, as a last resort. So, even if telehealth was appropriate in supporting the provision of advice or treatment, the decisions made around the way it was implemented could impact how and when it was used.

Participants were asked to comment on the sustainability of the service (**Table 60**) that is, should the service be continued or expanded?

Table 60: GPs perceptions on the expansion and continuity of service

ID	Service expansion and continuity
1	Yes definitely. There aren't as many unhappy doctors and patient get access to the care they need which is fantastic!
2	Definitely continued, and expanded if possible. Telehealth is a good alternative to telephone calls. For instance, if a nurse tried to get in touch with someone at the Royal Children's Hospital for advice, but can't reach the person, they can use telehealth with a regional hospital or they would contact us if it was an extreme situation.
3	Yes it should be continued.. there's always scope for expansion and increased demand of telehealth for remotely based patients. Another comment – telehealth is fantastic but face to face medicine hard to beat. At times, patients are unnecessarily transferred after a telehealth consultation. If one of us local doctors had seen them, we wouldn't have encouraged the transfer. We need to conserve ambulance transfers. For example, 1 elderly patient who had a fall and other acute issues was transferred to Wodonga and ended up having a long and complicated medically intensive condition and he passed away. He was already managed palliatively. Benefit of being a local GP – we always knew that he would be unwell but managed him differently. It is not a system fault, but he should have been managed by the GPs.
4	Expanded to start a bit earlier – currently starts at 9pm, could start at 7 or 8pm and go till 7am or 8am. Definitely should be continued.
5	Yeah I think there is potential and it is good having telehealth there when we do the shared on call.. I might be consulting through telephone with a nurse looking after patient in Bright.. potential is there for GP to do telehealth with Bright. For example, wound that need suturing, patient can come from Bright to GP to do it but if GP can see it first, then they can be transferred to hospital if the need be – that is if GP cannot handle the case. This is how the service could be expanded.
6	It needs improvement – no value in it for us partly our fault in regard to implementation. Could be fantastic but it's not amazing yet.. it is very cumbersome at the moment. Facetime through phone and ipad is easier. Don't stop telehealth, improve it. Telehealth is the key to improve health outcomes for those in rural areas.
7	I think there's value in it.. I think if we are under more pressure for providing after-hours, then we may use it more. At the moment there is no need to expand.
8	Where it is at the moment, it is not useful because nurses know how to handle those patients. Cat 4 and 5 can wait till in the morning. It needs to be sicker patients that we try and use it for. But, it is a great thing to have. Change the way it is used.
9	Should be continued, especially if it reduces the number of calls later in the night.

All participants felt that the service should be expanded and continued. They felt that it had a lot of potential. It was a good alternative to phone calls (P2) and had improved patient access to care (P1). It could be expanded in various ways. One participant (P5) suggested that the nurse should be able to contact the GP via telehealth. An example of a clinical situation was a patient needing a wound to be sutured. If the GP could handle the case, the patient need not be transferred to a regional hospital. Another suggestion was for the time for after-hours telehealth to be extended (so start telehealth consultations earlier and finish later in the morning). One participant (P3) brought up a scenario where the patient should not have been transferred after a telehealth consultation. The patient was quite unwell and receiving palliative care to some extent. It would have been ideal for the patient to be treated by the local GPs. Instead a decision was made to transfer the patient who unfortunately passed away. This was not considered a fault of the system. It is an unfortunate set of circumstances that led to this occurrence.

Participants were lastly asked to provide further feedback on telehealth (**Table 61**).

Table 61: Other feedback on telehealth provided by GPs

ID	Feedback on telehealth
1	Only thing is completely changed our lives which is fantastic.. few things have changed – doctors staying on.. we would have been called at least once a night.. get called a few times overnight between 11pm and 7am.. with telehealth we talk about a handful of times.. ambulance going straight to Wang else we wait for 2 hours waiting for ambulance to come in.. other thing is junior doctors managing.. experienced rural GPs at other end of telehealth line, potentially quicker.. junior doctors tend to request multiple tests before sending home. But they are gaining experience by working those hours. But, quicker treatment may be enabled by having GPs. But, this may cost more money.
2	I think it is a great innovation – well aware of the fact that there are some short comings but they're more theoretical issues. One of the issues is let's say I am an experienced doctor, the person on the other end of a telehealth consult is the least experienced person at hospital. They make get through the consultation but it is not with someone who has a lot of experience.
3	Not really, very valuable service that has been offered to us for extra help. Really important for workforce retention. Fully staffed here with 3 doctors. If one left it'll be a problematic. I think it's a valuable service for patient. Before we used the telehealth, we were doing a lot more phone consults when local doctor unavailable so unnecessary patient transfers. Telehealth has reduced these transfers since the doctors in Wangaratta can "see" the patient.
4	No only that from an after-hours point of view, our job is easier and we are happy with it.
5	Couple of patients since equipment is there we did telehealth.. for instance for an in patient consultation with surgeon rather than transferring. Chronic ulcer case – patient in local hospital and surgeon in Wangaratta. It was good from that point of view – patient was pleased.
6	I am a strong advocate for telehealth. I've been using it for 3 years. I was one of the first to use it using skype. I do 4 telehealth consults a week. I am in favour of it but technology hasn't worked for us. Incredibly complex.. I use an iPad with skype and this is more successful, cheap, effective, works just as well. When nurse has visual question, the take a photo on their iphone and send it to the doctor. Less cumbersome. Telehealth is a typical technology supported by bureaucrats. It is expensive, cumbersome, could have done the same job with Skype. When I have a consultation at Hotham, I see injured patients everyday a week, in the last 5 years using iphone technology, I take a photo, or picture of an X-ray and send text message to specialist in Melbourne. Patients are not bothered about privacy. They are happy to gain access to specialist advice rather than travel hours to Melbourne. Only bureaucrats care about privacy.
7	Our hospital and community use telehealth minimally. I have spoken to other people who are on call and who do more on call than me, and they didn't feel that using telehealth when we are on call would make a difference.. we do not see a lot of category 4 and 5. Nurses phone the doctor directly and often we deal with it over the phone. Also, in our phone message we direct them to nurse on call and GP helpline so patients are already been triaged. We then organise for them to come into clinic next day.
8	Capabilities must be enormous. It isn't helping us doctors in the way it is used in the hospital (cat 4 and 5 patients). It would be very useful if we had to make decisions about where to transfer patients, and get advice on how to treat patients. So, it can be used in a different way. The lack of immediacy of the telehealth conferencing can be problematic. I wish that I could have asked advice of others, but we are not using it in that way. Our ambulances and patients go to Shepparton but Shepparton not part of telehealth due to administrative issues and different personalities.
9	It's just been implemented. One of the nursing staff was hesitant in regard to the technology side. They haven't used it very much. They have had training, but there are some technical issues with the video so some consults are done via phone.

Most participants (5 in total) found telehealth to be a great innovation and a valuable service with enormous capabilities. One participant (P1) had continued to praise telehealth as a technology that had improved the doctors' quality of life as they were staying back in Yarrowonga for work purposes (staff retention was also brought up by participant P3). The number of after-hours calls had reduced and ambulances were sent to Wangaratta if required. However, this participants as well as another

participant (P2) expressed slight concern over the fact that it was junior doctors providing the treatment at Wangaratta rather than an experienced person. But, it was acknowledged that having someone with more expertise at Wangaratta, may be more expensive.

Participant P6, who had been an advocate for telehealth, even before the project was implemented, felt that this model of telehealth was quite cumbersome and time consuming, due to the administrative workload. Having used an iPad, iPhone to take photos and send these to specialists in Melbourne who then provided advice, this participant found the telehealth system to be expensive and too complex in nature. He felt that the privacy issue was minor and patients are happy for doctors to use mobile devices to transmit X-rays or photos of the patients' wounds etc. In this situation, the telehealth system may be a secondary option. Nurses may treat the majority of patients, call the doctor as a second resort after-hours, and if all fails, resort to telehealth.

Appendix H: Survey Data Analysis

Clerical Staff

Introduction

Surveys were administered with 6 clerical staff, who had either used telehealth or assisted junior doctors with using telehealth, between January 2014 and April 2015. The aim of the survey was:

- To understand the clerical staff's experience with the telehealth service.
- To understand whether telehealth has improved the efficiency of providing care.
- To identify any issues with the telehealth consultation.

A thematic analysis of the data is presented below.

Background information on clerical staff

Participants were asked to provide their gender and age. All participants were female. The majority of participants were aged between 51 and 60 years. This information is summarised in **Table 62**. Participants were then asked to provide the location of their healthcare service. All participants were based in Wangaratta.

Table 62: Age range of clerical staff

Age range	Number of participants
40-50	2
51-60	3
61-70	1
TOTAL	6

Following this, participants were asked about the length of time they've worked at their current hospital. Most participants had been working in their current role in the health service for more than 5 years (5 participants). Participants were also asked whether they worked full time or part time. 5 participants worked part time and 1 worked full time.

Table 63: Length of employment of clerical staff/service in current hospital

Length of service in current hospital	Between 1 and 5 years	More than 5 years	TOTAL
Length of service at current hospital	1	5	6

Of the participants, 2 had always worked in the Emergency Department and 4 had frequently worked in the Emergency Department. As seen in **Table 64**, most participants had worked the day, afternoon, night shifts, and on weekdays and weekends (5 participants for each shift type - please note that some participants had selected multiple options in regard to the type of shift). 3 participants worked the night shift.

Table 64: Clerical staff frequency of work in UCC and type of shift

Type of shift	Number of participants
Day shift	5
Afternoon shift	5
Night shift	3
Weekdays	5
Weekends	5
TOTAL	23

All participants had arranged telehealth consultations. Participants were then asked questions that specifically addressed the frequency of use of the telehealth system. As seen in **Table 65**, most participants have used telehealth between 6 and 10 times (3 in total), a few weeks ago (5 in total).

Table 65: Clerical staff frequency and recent use of telehealth system

Frequency of use of telehealth system	Number of participants
1 to 5 times	1
6 to 10 times	3
11 to 15 times	1
16 to 20 times	1
TOTAL	6
Recent use of telehealth	Number of participants
Today	1
A few weeks ago	5
TOTAL	6

Thematic Analysis of Data

The main theme for this efficiency and sustainability. Since the participants are not involved in providing care to the patients, but taking care of the administrative side, and ensuring that the consultations are arranged and run smoothly from a technical perspective. Without this support, the telehealth initiative may not be sustainable.

Efficiency and sustainability: achieving desired results with the most cost effective use of resources. Capacity of system to sustain workforce and infrastructure, to innovate and respond to emerging needs.

Accessibility: People can obtain healthcare at the right place, at the right time irrespective of incomes, physical location and cultural backgrounds.

Continuity of care: Ability to provide uninterrupted coordinated care or service across programs, practitioners, organisations and levels over time.

Responsiveness: Healthcare service is patient oriented. The client is treated with dignity, confidentiality and encouraged to participate in choices related to their care.

These themes will be used to analyse the rest of the data.

Efficiency and sustainability

In order to support the process of arranging teleconsultations and dealing with any issues, the participants required guidelines and training.

Participants were first asked whether they had guidelines detailing the process to be followed for a telehealth consultation, and guidelines regarding the paperwork required for the telehealth consult.

Table 66: Clerical staff perceptions on existence of guidelines

Guidelines	Process to be followed for teleconsultation	Paperwork
Agree	5	4
Strongly agree	1	1
TOTAL	6	5 (1 no response)

The majority of participants (5,4 in total) agreed that there were guidelines in place detailing the process to be followed for a telehealth consultation and guidelines regarding the paperwork for a telehealth consult.

Participants were also required to comment on whether they received education and training regarding telehealth consultations. All participants, with the exception of one (P3) had received education and training. Participants were also asked whether this prepared them for undertaking a teleconsultation. 4 participants agreed, 1 participant strongly agreed and 1 disagreed. However, no participant felt that they needed further education.

Part of sustaining a workforce is differences in workload. Participants were asked whether telehealth had an impact on their workload. As seen in **Table 67**, most participants felt that their workload had increased by anything between 50% and 60% (3 in total). Some participants (3 in total) had sometimes helped in setting up telehealth equipment (the other 3 participants had never done this). This could have an effect on the workload.

Table 67: Clerical staff perceptions on difference in workload

Increase in workload	Number of participants
<50%	1
50%-60%	3
61%-70%	0
71%-80%	2
TOTAL	6

Also part of sustainability was the levels of stress for the participants. No participant felt stressed when using telehealth. Participants were asked whether they had faced any aggressive behavior from patients using the after-hours telehealth system. No participant had faced such issues.

Accessibility, Continuity of Care and Responsiveness

Participants were also asked whether accessibility, continuity of care and responsiveness had any effect on their capacity to treat patients. These three terms are defined again below:

Accessibility: People can obtain healthcare at the right place, at the right time irrespective of incomes, physical location and cultural backgrounds.

Continuity of care: Ability to provide uninterrupted coordinated care or service across programs, practitioners, organisations and levels over time.

Responsiveness: Healthcare service is patient oriented. The client is treated with dignity, confidentiality and encouraged to participate in choices related to their care.

The relevant data has been discussed under each of these themes.

Accessibility (clerical staff)

Part of gaining access to care is getting the required care at the right time. Participants were asked about the amount of time the patient had to wait between adding the telehealth referral to the Emergency Department work list and being seen by a doctor.

Table 68: Perceptions of clerical staff on waiting time

Wait time	Lesser than ½ an hour	½ an hour to 1 hour	Between 1 and 2 hours	More than 2 hours	TOTAL
Wait time between referral and consultation	2	1	1	2	6
Contacting hospital to arrange telehealth consult is simple					
Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly Agree	TOTAL
0	3	1	1	1	6

As can be seen in **Table 68**, most participants stated that patients had to wait either less than half an hour or more than 2 hours for a telehealth consultation. The maximum amount of time a patient had to wait was 11 hours and 48 minutes (P2). Participants had to comment on whether communicating with the referral hospital to arrange a telehealth consultation was straight forward and simple. The majority of participants disagreed (3). Some chose to comment on this:

“Nurses not always sure how the system works” [P1]

“Not all the hospitals are following the procedure as to how it should be done. Ringing straight through to the emergency department asking for the DR without first having the patient being first put onto vital with all details. Also we are told to scan the report back to the hospital. Now the nurse is telling me to fax it back.” [P3]

Based on the comments, the nurses had not known how the system worked or were not following the procedures in place or bypassing the system by not using it and instead, calling the Emergency Department. Perhaps this indicates a need to better understand the use of telehealth by the nurses, specifically the drivers behind their decision to make a phone call rather than undertaking a telehealth consultation.

Participants were also asked whether there was a difference in wait time for a telehealth referral patient and a patient waiting in the Emergency Department. Three participants felt that there was a difference and 3 participants felt there was no difference. The participant (P2) who stated that the patient had to wait 11 hours and 48 minutes stated that there was no difference in wait time.

Participants had to comment on whether the patients in the Emergency Department were aware that there were virtual patients waiting for a telehealth consultation. No patient was aware of this.

Continuity of Care (clerical staff)

Participants were asked about the provision of uninterrupted, coordinated care. A few aspects can be discussed under this theme:

1. Provision of care plan and paperwork after the telehealth consultation
2. Follow up with the General Practitioner (GP) and sending a letter about telehealth consultation to the GP.

Each of these will be discussed below.

Paperwork before and after the telehealth consultation

Continuity of care was also dependent on the process following the telehealth consultation. Participants were asked whether the paperwork required before and after the telehealth consultation was received and sent in a timely manner.

Table 69: Clerical staff perceptions on provision of care plan and paperwork following teleconsultation

Paperwork received and sent on time	Always	Mostly	Never	TOTAL
Paperwork received on time	3	3	0	6
Paperwork sent in timely manner by doctor	3	3	0	6

As seen in **Table 69**, most participants felt that the paperwork was always or mostly received and sent back in a timely manner. Some participants chose to comment on the paperwork:

“Doctors need to be told the first time how to complete the paperwork for return to the outlying hospital.” [P1]

“Hospital nurses need to note medicare number and expiry and pension health card numbers and expiry dates on information to our hospital for registration.” [P6]

Based on the comments, there was a need to tell the doctors how to complete the paperwork when they are faced with this task for the first time. It was unclear as to whether the nurses need to provide additional information, apart from that requested in the form or whether they are sending incomplete information to the hospital.

Sending a letter about telehealth consultation to the GP

Part of continuity of care was whether the patient routinely followed up with their General Practitioner (GP) and whether a letter was sent to the GP following the teleconsultation. This ensured that the local doctors were aware of the patient’s treatment and condition, should there be any further issues. Five participants were not sure as to whether the GP received a letter and one stated that this never occurred.

Responsiveness (clerical staff)

It is important that the participants be treated with dignity and respect, when communicating with the nurse at the outlying service.

Table 70: Clerical staff treated with dignity and respect

Responsiveness	70%-80%	81%-90%	91%-100%	TOTAL
Dignity and respect	1	1	4	6

As seen in **Table 70**, most participants felt that they were treated with dignity and respect (rating between 91% and 100%). This shows that the communication process between the two parties was good.

Other Comments (made by clerical staff)

Participants were asked whether they were aware of any problems encountered by doctors or nurses when using the telehealth system. 2 participants said yes and 4 said no (no comments provided).

Participants had to comment on how confident they were with processing patients using the telehealth service.

Table 71: Clerical staff confidence in arranging telehealth consultations

Confidence in processing patients	Number of Participants
70%-80%	2
81%-90%	1
91%-100%	3
TOTAL	6

As seen in **Table 71**, the majority of participants (3 in total) rated their confidence level at 91%-100%. This is a good sign that the telehealth system is a sustainable initiative.

Participants were asked whether the telehealth service was working well.

Table 72: Clerical staff perceptions on telehealth service working well in organisation

Telehealth service working well	Number of Participants
Strongly disagree	0
Disagree	0
Neither disagree nor agree	2
Agree	2
Strongly agree	2
TOTAL	6

As seen in **Table 72**, most participants either had a neutral response (neither disagree nor agree), agreed or strongly agreed that the telehealth service is working well at their hospital.

Lastly, participants were asked to provide further feedback on the telehealth service:

“Unable to give nursing staff at hospitals timings regarding when the telehealth can be used due to demands in the ED. Can be frustrating when you input all the patient’s details onto Vital and then the patient is not prepared to wait until the doctor can use telehealth.” [P1]

“Sometimes when the nurse from the hospital rings us for a telehealth patient and they have never been to our hospital and we are busy with patients presenting face to face with us answering the phone it can be quite hectic.” [P3]

“Sometimes in ED, when workload is a lot, telehealth consultation patients have to wait a little till my urgent workload is finished.” [P6]

Based on the comments, there was one common issue – time constraints and dealing with an increase in number of after-hour patients. It was hard for the participants to manage the patients in the Emergency Department and arrange telehealth consultations for the relevant outlying services.

Appendix I: Interview Analysis

Chief Executive Officers or Directors of Clinical Services/Nursing

Introduction

Phone interviews were conducted with 6 Chief Executive Officers and 1 Director of Clinical Nursing (referred to as decision makers from now on), from the areas where telehealth had been implemented in the Small Rural Healthcare Centres, as well as North East Wangaratta. These interviews were conducted in May 2015. The aim of the interview was:

- To understand whether telehealth has made a difference to the healthcare organisation and to the community.
- To understand whether telehealth is a sustainable initiative.

A semi-structured questionnaire was used for the interviews.

Background information on decision makers

The role of each participant and the location of the health service in which they were based is provided in **Table 73**. Most of the participants were CEOs of the participating healthcare organisations.

Table 73: Role and location of participants (CEOs, Directors of Clinical Services/ Nursing)

ID	Role of Participant	Location of healthcare service
1	Chief Executive Officer	Beechworth
2	Chief Executive Officer	Benalla
3	Chief Executive Officer	Cobram
4	Chief Executive Officer	Corryong
5	Chief Executive Officer	Numurkah
6	Chief Executive Officer	Yarrawonga
7	Director of Clinical Services/ Nursing	Wangaratta

Thematic Analysis of Data

The main theme for this efficiency and sustainability:

Efficiency and sustainability: achieving desired results with the most cost effective use of resources.

Capacity of system to sustain workforce and infrastructure, to innovate and respond to emerging needs.

Efficiency and Sustainability

Participants were firstly asked whether or not telehealth had led to any changes in staff recruitment or staff retention. The responses are provided in **Table 74** below.

Table 74: Decision makers' perceptions on impact of telehealth on staff recruitment and retention

Participant ID	Staff recruitment and retention
1	Hasn't made a difference in terms of attracting or retaining staff. Little difference, but we don't have these issues in the region anyway.
2	I don't think it has impacted on recruitment in any way. Possibly assisted in retaining staff.
3	No, we only use telehealth sparingly some staff haven't taken it up haven't used it - we have quite senior staff on night duty when it's more likely to be used so they have been doing that role for a number of years so they are used to seeing patients without a doctor.. they are comfortable managing situation themselves.
4	It has. We started with telehealth connecting with Wangaratta over 12 months ago. It was originally used as a strategy to retain GPs.. we have 3 GPs who rotate on weekends.. we employ GPs at our hospital.. we didn't want them to do one weekend. We give the doctors a weekend off call so that once a month we do telehealth with Northeast Health. We have now got a 4th year GP registrar. As a registrar has become competent and able to take on more after-hours call independently, means they have less burden on GPs. If doctors are overworked, they can move out.. so it's a juggling act.. what we need and what we want and what we can get. Recruitment and retention is dependent on family environment and here there is no private school, no restaurants or night life.. we recognise that we have to make it attractive. Beautiful place but people want family life.. time off for doctors helps.
5	Whilst we have not had to use telehealth on many occasions yet it definitely makes a difference in providing back up and reassurance to nursing staff. It also reduces the burden on local GPs who have worked all day and then remain on call overnight.
6	Yes it has for our doctors they are very satisfied and this has helped in retaining staff.
7	I don't think I can relate it directly to either of these, but leadership of telehealth has contributed to our reputation as an innovative health service. Attracted a lot of interest nationally that wouldn't have happened before. Use of technology to provide access to patient care was a key reason we won regional service of the year 2014. Contributed to reputation and grown our partnerships. 2 examples. Within the Hume Corryong health service, they are not an immediate part our family. Corryong with telehealth has become a partner and early adopter. The technology is very helpful to them every 4th weekend when they don't have GPs. In this current environment there is increased focus on supporting the sustainability of district hospitals, and telehealth has helped in this regard. We have 48 junior doctors rotating and we tell them about telehealth and they're very interested in it. Another dimension to training experience particularly under grad and post grad doctors operating into the future. Telehealth is part of the future and they are getting some exposure to it.

Telehealth seemed to have made a difference in staff recruitment and retention in Beechworth [P1], Corryong [P4] and Yarrowonga [P6]. In the other regions, telehealth had not made much of a difference yet for reasons such as limited use by nurses (nurses experienced enough to handle cases; lack of cases requiring telehealth consultation) and lack of issues around recruitment and retention in the region. In Wangaratta, the providers of the telehealth service to the other regions, their leadership in implementing telehealth had led to an improvement in their reputation. They were partnering with more health services such as Corryong. Junior doctors were also able to gain some experience with telehealth as a result of working in the hospital.

So, overall, telehealth seemed to have made some difference in the recruitment and retention of staff.

Participants were then asked whether telehealth has made a difference to the community and the way they accessed care after-hours. The responses are provided in **Table 75**.

Table 75: Decision makers’ perceptions on impact of telehealth on community’s access to care

Participant ID	Difference to the community
1	It has - our UCC is a very low grade emergency dept. Most of the time a person is reviewed by a GP. After-hours does not have coverage from GPs every day of year - link in with ED at Wangaratta is good so that person presenting at UCC after-hours is able to be seen in their own town. No travel required.
2	We haven’t had any feedback - no opinion in the community.
3	Used it around 7 or 8 times but feedback is really positive so patients do like it.
4	The community was hesitant but now they’ve embraced it. Initially, they were worried about the lack of physical examination but now a lot of education around the community to explain retention of people - older generations don’t want change but we have explained that we want to retain GPs. Also, we are quite isolated, we are at the base of snowy mountains, there can be snow on ranges, windy, single lane roads. So very hard and therefore, local people don’t want to do a 3 hour round trip plus wait 5 hours to be treated.
5	We have not had the need to utilize telehealth on many occasions so far but those who have used it have been very impressed and thankful for the service.
6	It has slightly. Between 11 and 7am if a person calls for help, an ambulance takes them to North East Health, and if they present to the health service they are treated the same way except for categories 3,4 and 5 when telehealth may be used.
7	During the after-hours, a person doesn’t need to endure an ambulance trip. We are also looking at expanding telehealth into the provision of support for residential care facilities by nurse practitioners so people in Wangaratta are getting advice about care and this can prevent transfers. We are also thinking of providing telehealth to urgent high risk clinics.. patients’ with burns for instance, can be reviewed here.

With the exception of Benalla [P2], there had been positive feedback on the impact of telehealth in the community. Patients were satisfied with the service and had not endured travelling for hours to seek care in difficult conditions [P4]. Telehealth had enabled connectivity to doctors on days that GPs were not on call during after-hours [P1]. So, overall, telehealth had made a difference to the community, even if it had not been utilised to a great extent.

Participants were then asked to comment on ongoing and projected costs in relation to using telehealth. The results are presented in **Table 76**.

Table 76: Decision makers’ perceptions on ongoing and projected costs related to telehealth

Participant ID	Projected and ongoing costs
1	In terms of costs for us, telehealth unit itself is worth about \$10,000 per annum and this is an ongoing cost. Then there is potential for medical costs to be incurred like emergency physician undertaking review at the ED. not a cost at this stage but I would guess that the person needs to be paid about \$200 dollars an hour.
2	No direct costs associated with it so no savings attached. Projected costs – NEH may need a full time project manager so there may be costs associated with that.
3	Prac cart funded through project – service charge for equipment and broadband is an ongoing cost.
4	If it goes on there will be costs. We do pay for connection, broadband and IT costs but because it is a project, the telecart was brought through the project funds. But once project is over we have to start paying. There will be some costs.. We will look at that.. We haven’t reduced our doctor’s salaries, even though they are taking fewer after hour calls. One of the other things is credentialing.. Who owns the patients? So, Medico legal questions.. Who owns the history? We have already started considering this – for instance, the ED doctor is legally allowed to prescribe medication to patients in our UCC.
5	We received the equipment as part of the project. There has been some costs in training staff, but this has been minimal. We looked at getting a second machine for use in primary care, however the ongoing costs are proving prohibitive, so this is on hold.
6	Maintain the equipment, in terms of our internal costs nothing really. Staff costs for NEH in regard to having a project manager.
7	The initial costs around establishing technology and buying the machines hardware replacements that is networks.. Looking into the future maintenance of technology, the health services are not funded so we at Wangaratta have to think about this cost. Apart from that, significant cost is the role of the project officer. We need a project officer to support the management of change over several years. Need at least 6-7 years for telehealth to be established. Major cost is to support the project officer who has to go to all health services to help in education, policies and procedures beyond the urgent care setting. There is also costs around clinical governance.

The main ongoing cost stated by all the participants was maintenance costs for the telehealth equipment. Some participants [P1, P2, P6], had discussed costs to North East Health Wangaratta, around paying ED doctors for the telehealth consultations as well as costs around employing a project officer. The CEO of Wangaratta [P7], in agreement with this, discussed the cost of hiring a project officer on a full time basis, to support the changes that may take place as telehealth becomes part and parcel of the work routine for clinicians. Another important cost was the medico legal costs (P4), and clinical governance costs (P7).

If the telehealth system implemented via this project was being used for other purposes, it may be more sustainable in the health service. As seen in **Table 77**, 6 out of 7 participants stated that telehealth had not been used for other purposes but this was something that they may consider in the future, to connect GPs with specialists, or to connect to Adult Retrieval Victoria. 1 organisation (P4 – Corryong) had invested in another telecart that was used for consultations between the GPs employed in the hospital and specialists in Melbourne or Albury. At Numurkah (P5), the telecart implemented as part of this project, was being used to connect patients with psychiatrists. This meant that the psychiatrist need not visit the hospital once a month.

Table 77: Decision makers' perceptions on telehealth equipment use for other purposes

Participant ID	Equipment being used for any other purpose?
1	It hasn't as yet but that is my plan.. we want to establish connectivity with GPs in surgery and specialists.
2	Used for after-hours care only. No hasn't been expanded.
3	Not as yet but something that we may think about in the future.
4	We do have another prac. cart that we purchased - our GPs, who are employed here in the medical clinic, use the cart to connect to specialists in Melbourne or Albury for advice on treatment plans.
5	We use the telehealth set up for regular Psychiatrist consults for patients. This has been very successful. When we reopen our new hospital this month we see linking with specialists as an area that we will heavily promote.
6	No but we have discussed the potential of it being used for adult retrieval Victoria.
7	Yes. All the health services have telecards, so they can take them to the patient. So, this mobile technology can be used for other reasons. With developments of telehealth into the future, there will be technology that is made for a purpose. For instance, there are lactation clinics that provide support to women in their homes. These women reside in isolated area. They are able to use Skype on an iPad and communicate with someone in the clinic. So, there are a lot of possibilities.

In line with the previous question, participants were asked whether the service should be continued or expanded (**Table 78**). All participants believed that it should be continued and expanded. They could see the potential in telehealth in enabling partnerships with other health services (P5) as well as being used to connect with specialists (P6). Telehealth could reduce the back log in EDs by reducing transfer of patients (P1) and support overworked clinicians in isolated areas (P7).

Table 78: Decision makers' perception on the expansion or continuation of service

Participant ID	Service expansion and continuity
1	Should be expanded and should be continued.. It can be replicated over other small rural health services.. Ee don't have many people presenting to our urgent care centre, but telehealth will help in reducing the back logs in EDs, if transfers can be avoided.
2	Definitely continued and possibly expanded.
3	I think it could be expanded and used for category 3 patients and also for referrals to adult retrieval Victoria.
4	Absolutely no question in my mind - I'd like to see it expanded.. But our community wouldn't like to get rid of doctors on call after-hours.. We have to balance it out. Telehealth it is an essential part of our work and our community has accepted it..
5	Definitely expanded and continued and often forms part of conversations with other services we wish to work in partnership with.
6	Yes, I think there are other areas in which telehealth can be used, outside of urgent care. For instance, looking after Physicians reviews for our sicker patients. Patients can be closer to home if they are able to have such consultations.
7	Absolutely. We are coming into a time where telehealth is seen as an extraordinary dimension.. Clinician needing to touch patient may need to be necessary. When used in right circumstances, telehealth can provide healthcare to people at point of arrival without transfer. It offers tremendous support to clinicians working in isolated areas.. They haven't experienced this sort of backup before.

Finally, participants were asked for further feedback on telehealth (**Table 79**). 5 out of 7 participants had positive feedback about telehealth. While 1 participant [P1] stated that it has been embraced by the clinicians, another participant commented that it was yet to be adopted by the staff [P3]. But, they both felt that telehealth was a positive initiative. Telehealth was seen to enable easier access to care closer to the patient's home [P1, P5].

Table 79: Decision makers - Further feedback on telehealth

Participant ID	Further feedback on telehealth
1	No I think it is great and it's so simple with digital technology the way it is now. I think our GP and nursing staff have embraced it. We could also use it for allied health care. What we are trying to do with larger health services is we don't have an Operating Theatre (OT) so people are going to bigger facilities.. we want them to come home sooner .. so review and follow up at Beechworth rather than larger hospital. Telehealth can be used for this purpose.
2	No I think it's been a positive project and hope it continues. Other opportunities to be expanded but a bit of time required for this.
3	Overall, we see it as a positive but there are some limitations as well.. will take a while to be taken up by our staff. Staff just being reluctant to go through process of getting an appointment. It hasn't been a big issue but this is a barrier for some of our staff.
4	Definitely should be continued and expanded.
5	Telehealth is definitely something that needs to be supported into the future. Ensuring consultations are funded at both ends of the system will help to encourage use. In rural and isolated areas with no public transport the ability to have specialist consultation and advice easily accessible is invaluable and needs to be promoted heavily.
6	No
7	No

Appendix J: Survey Data Analysis

Patient Data

Introduction

Surveys were administered with 34 patients, who had used telehealth in various Small Rural Health Centres, between January 2014 and March 2015. The aim of the surveys was:

- To understand the patient's experience with the telehealth service.
- To understand whether telehealth has made a difference to the way the patient accesses healthcare, their ability to receive uninterrupted care and client oriented care.
- To identify any issues with the telehealth consultation.

A thematic analysis of the data is presented below.

Background information on Patients

A comparison between the data of the telehealth consultations and the date on which the survey was completed, highlighted that most participants (14 in total) were surveyed within 0-3 months of the telehealth consultation. The longest gap was 1 year and 8 months.

Table 80: Lapse of time between teleconsultation and administration of patient survey

Duration of time in months	Number of respondents
0-3 months	14
4-6 months	4
7-9 months	7
10-12 months	4
Over a year	5
TOTAL	34

The majority of participants (this could have been a carer who was surveyed on behalf of the patients) were between the ages of 31 and 70 (demographic data for one participant is missing). A breakdown of the age groups is provided in **Table 81** below. 24 participants were female and 10 male (this could again be the carer demographics or the patient. This distinction is not clear in the data). Participants were requested to provide their postcode. 9 patients were based in Corryong, 8 in Yarrawonga, 5 in Benalla. The rest of the patients (10 in total) were each based in different parts of Victoria. The majority of participants (14) worked full time and earned more than \$18,200. 33 participants were born in Australia and 1 of the participants identified themselves as Aboriginal or Torres Strait Islander descent. The breakdown for these demographics are provided below.

Table 81: Age, postcode, employment status, income of patients

Age	Number of participants
10-20	1
21-30	9
31-40	8
41-50	6
51-60	1
61-70	6
71-80	0
81-90	1
91-100	1
TOTAL	33 (demographic data for one participant is missing).
Postcode	Number of participants
3707 (Yarrawonga)	9
3730 (Wangaratta)	9
3672 (Benalla)	3
3669 (Benalla)	2
Other Postcodes (2647, 3016,3567, 3644,3685,3705,3747, 3796, 3835, 3156)	10
TOTAL	33
Employment Status	Number of Participants
Full Time	14
Part Time	9
Unemployed	2
Not in labour force	8
TOTAL	33 (information for one participant is missing)
Income on a yearly basis	Number of participants
>18,200	12
18,201-37,000	5
31,001-80,000	9
80,0001-180,000	2
180,001 and over	1
No response	5
TOTAL	34

Basic Information on telehealth Consultation (patients)

Most of the teleconsultations took place in Yarrawonga (16 in total). 28 participants had their teleconsultation in their local hospital. Most participants had visited the hospital where their teleconsultation was, between 0 (local hospital was different) and 5 times. 30 participants had used the telehealth system once. All this data is summarised in **Table 82** below.

Table 82: Basic information on telehealth consultation (patients)

Locality of telehealth consultations	Number of Participants
Yarrawonga	16
Corryong	11
Benalla	6
Cobram	1
TOTAL	34
Teleconsultation took place at local hospital?	Number of Participants
Yes, it took place at my local hospital	28
No, it was at another hospital	6
TOTAL	34
Number of times participant has visited hospital for after-hours care	Number of Participants
Many times	6
Few times	2
0-5	22
6-10	3
TOTAL	33 (1 participant provided no response)
Times telehealth was used	Number of Participants
Never used	3
Once	30
Twice	1
TOTAL	34

As seen in **Table 83**, the majority of participants had a teleconsultation for themselves (23 in total). Most participants went to seek attention for a respiratory problem (9 in total). Please note that in Table 83 below, the number of participants who had a particular issue is 1 unless indicated in parentheses.

Table 83: Patient who had teleconsultation and reason for teleconsultation

Who was teleconsultation for?	Number of Participants
For themselves	23
Child	9
Spouse/partner	2
TOTAL	34
Body system where problem occurred	Description of problem
Digestive System	<ul style="list-style-type: none"> Excessive vomiting and diarrhoea. Crohn's disease flare ups. Extreme gastro. Ruptured gall bladder. Vomiting and bowel obstruction. Partner had violent vomiting and diarrhoea
Reproductive system	<ul style="list-style-type: none"> Spotting during early pregnancy. Gall bladder attack during pregnancy which is a common occurrence and she had been advised by her local GP to go to UTR when needing pain relieving medication to get an injection.
Urinary System	<ul style="list-style-type: none"> Kidney Stones(2) Had Urinary Tract Infection and was in a lot of pain.
Integumentary System (hair, skin, nails etc.)	<ul style="list-style-type: none"> Some type of bite marks, I was going to chemist next day but during the night they swelled up, were extremely painful and I felt terrible. As I was at my house by myself I went to the hospital before it got worse. Severe leg ulcer. Extremely painful. Rash localising to cellulitis as per referral data.
Skeletal or Muscular System	<ul style="list-style-type: none"> Sore leg - bit of skin knocked off. Didn't want to access care but was strongly encouraged to attend UCC by her carer. Fall - Possible broken ribs. chronic back pain - needing analgesia.
Respiratory System	<ul style="list-style-type: none"> Child with croup (4). Hayfever symptoms post mowing and arm was numb. Sleeplessness, shaking - sinus tachycardia and associated hypertension. 4 year history of presentations with sinus tachycardia. Child with asthma (2), 1 adult suffering from asthma.
Circulatory System	<ul style="list-style-type: none"> Migraine with associated hypertension.
Nervous System	<ul style="list-style-type: none"> Eye -Foreign Body (FB). Something in daughter's eye. Dizziness, Vertigo.
Lymphatic System	<ul style="list-style-type: none"> Tonsillitis.
Other (can affect any body system or more than one body system)	<ul style="list-style-type: none"> Leptospirosis (from animals). Growth and infection in breast. Liver problems for more than one year. Will need liver transplant eventually. Presentation was specifically for the breast lump and pain related to liver. Drug reaction.

Understanding teleconsultation

This refers to whether the participant was provided with a clear explanation of the teleconsultation before proceeding with the consultation, and whether the consultation itself was easy to understand. 29 participants (for both queries) stated that they were given an accurate explanation about what would occur during the consultation. 5 participants (for both queries) disagreed or could not comment. 1 participant could not provide a response as telehealth was not used for the consultation. Of those who provided a comment, 1 participant commented that the nurse had not known how to use telehealth as it was her first time – therefore no explanation was provided [P6]. 1 participant was too unwell at the time to remember [P12].

In line with this, participants were asked if anything unexpected occurred during the consultation. 27 participants stated that nothing unexpected occurred, 3 stated yes, and 4 participants did not provide a response. Of the three that stated something unexpected occurred, one participant stated that he/she was not provided with the prescription required [P16]. Another participant stated that there were issues with establishing the connection [P17]. The last participant stated that the doctor decided that a needle biopsy was required, and made the right referral for the patient. They also did an accurate breast examination which was excellent [P30]. This highlighted that the explanation provided before and during the consultation was reasonably accurate and in the majority of cases, nothing unexpected happened to the patients during the consultation.

Thematic Analysis of Data

The data will be analysed under 3 themes based on the Australian Institute of Health and Welfare (AIHW) health performance framework.

Accessibility: People can obtain healthcare at the right place, at the right time irrespective of incomes, physical location and cultural backgrounds.

Continuity of care: Ability to provide uninterrupted coordinated care or service across programs, practitioners, organisations and levels over time.

Responsiveness: Healthcare service is patient oriented. The client is treated with dignity, confidentiality and encouraged to participate in choices related to their care.

Accessibility (patients)

The patient should be able to gain access to the required health service at the right place at the right time. The following section presents the data that is relevant to this.

Part of accessing telehealth was being aware of its existence (**Table 84**). Participants were asked whether they had heard of the telehealth service prior to visiting the hospital and whether many people in the community were aware of the after-hours telehealth service. 27 participants had not heard of the telehealth system before visiting the hospital. Of the 7 that had heard of it, 1 participant commented that he/she vaguely knew about the telehealth system [P18] and another participant said he/she had not realised that it was available in Corryong. He/she thought it was available in remote areas only [P20]. 18 participants were unaware of whether the people in their community were aware of the existence of this service, while 13 stated that they were not aware of the service. Of these, 1 participant commented that this was because many were mothers of young children [P23]. Of the 3 participants who stated that the community was aware, 1 participant [P16] commented that although the people in his/her community were aware of the service, they did not like it as they found it impersonal. Yet another participant commented that the members of the community with ageing issues were aware of the service [P18].

Table 84: Patient and community awareness of telehealth

Heard of Telehealth	Number of participants
Yes	7
No	27
TOTAL	34
Community awareness of telehealth	Number of participants
Yes	3
No	13
Don't know	18
TOTAL	34

Participants were asked what they would have chosen to do if the telehealth system was not available (**Table 85**). The majority of participants (15 in total) stated that they would have had to travel on their own or relative's car to another hospital. Of the 9 participants that would have waited at their local hospital or until the GP was available, 1 participant commented that his/her carer was distressed by the condition of his/her relative (patient). He/she insisted with the staff that the GP be called, but nurses were reluctant to call the doctor. The carer was very angry at this decision [P33]. No participant would have gone home and sought no further help.

Table 85: Patient's options if telehealth not available

Choices if telehealth unavailable	Number of Participants
Travel by my own or my relative's car to another hospital	15
Call an ambulance	7
Wait at my local hospital until the local GP was available	9
Make an appointment to see the GP when he/she was next available	2
Other	1 (didn't want to call in at all - was asked by the carer to do so).
TOTAL	34

Participants were asked about how long they had to wait from the time they arrived in the hospital till they had the telehealth consultation. They were also asked whether they were provided an accurate estimation of the wait time and whether this time was longer or shorter than seeing a doctor face to face in the emergency department. Most participants had to wait between 1 and 3 hours for a teleconsultation (18 in total).

18 participants were given an accurate estimation of the wait time. Of the 14 participants who said that this estimation was not provided correctly, one participant stated that the nurse was not aware of how to use telehealth as she had no experience with it [P6], one participant stated that the estimated time provided was 45 minutes but ended up waiting for twice that amount of time [P10], one participant [P20] stated that no specific time was provided and lastly, one participant [P26] stated that Northeast Health Wangaratta was contacted after the estimated time had lapsed. The hospital was too busy at that time to have a teleconsultation. The teleconsultation did not eventuate for this participant.

13 participants said that this wait time was shorter in comparison to seeing a doctor face to face. 6 participants said that the wait time was about the same. 4 participants stated that the wait time for their teleconsultation was longer. In the case of 1 participants [P26], the telehealth consultation did not eventuate and they could therefore not comment on this aspect (N/A in **Table 86** below). 2 participants chose not to respond.

Table 86: Patient’s perceptions on waiting times

Wait time	Number of Participants
Less than 1 hour	11
1-3 hours	18
More than 3 hours	2
Do not know	1
Not Applicable	1
TOTAL	33 (1 participant provided no response)
Accurate estimation of wait time provided	Number of participants
Yes	18
No	14
Not Applicable	1
Do not know	1
TOTAL	34
Wait time in comparison to face to face consultation	Number of participants
Longer	6
Shorter	13
Same	6
Depends on how busy ED is or medical condition.	3
Not sure	3
Not applicable	1
TOTAL	32 (2 participants provided no response)

Participants were asked how much money they spent out of pocket to use the telehealth service and whether they would have spent more, or less if they had sought healthcare elsewhere. As seen in Table 83 below, 30 participants had not spent any money out of their pocket for the consultation. One participant [P8] stated that they had to drive to Wangaratta which was an extra cost. 1 participant [P29] stated that he/she had to pay 85 dollars as he/she stayed overnight and a doctor came to see him/her the following morning which may be the reason for the charge. 15 participants stated that it would have cost them more money if they had to seek healthcare elsewhere. Of these participants, 4 commented that this money would have gone towards travel costs such as petrol [P15, P20, P21, P23]. 1 participant stated that it would usually cost 90 dollars to see a doctor, so she was pleased that the telehealth service was free as she is a single mother on a low income and there is no bulk billing in Benalla [P30]. 11 participants were unsure as to whether there would be a difference in costs. 1 participant chose not to comment (n/a in **Table 87**) on this aspect as the telehealth consultation did not eventuate [P26].

Table 87: Money spent on teleconsultation versus other modes of healthcare (patient)

Money spent on teleconsultation	Number of Participants
\$0	30
Paid a fee	2
Don't know	1
Not Applicable	1
TOTAL	34
Money spent if healthcare sought elsewhere	Number of Participants
More money	15
Less money	3
Unsure	11
Same	3
Don't know	1
Not Applicable	1
TOTAL	34

Accessibility is the ability to seek healthcare at the right time and the right place. Overall, participants had heard of telehealth, would have potentially taken longer to gain access to care if not for the telehealth service and waited between 1 and 3 hours for their consultation. This time frame was perceived to be shorter than waiting for a face to face consultation. Most participants did not spend any money on the consultation and felt that they would have spent more if they accessed healthcare through other means.

Continuity of Care (patients)

A patient should be able to receive uninterrupted, coordinated care. With respect to telehealth, the technology was the tool to support the provision of this type of care. The following section provides the results for this theme.

Technology capability

Participants were asked to comment on the audio and visual capabilities of telehealth. Since telehealth was dependent on these two aspects to connect to the doctors at the consultation site, it was important that the audio and video was clear in order to provide the appropriate assessment and treatment of the condition. The results are provided in Table 88 below.

Table 88: Patients’ perceptions on technology capability

Rating Scale	Connection was simple	I could see doctor clearly	I could hear doctor well	Doctor could see me clearly	Doctor could hear me well	Doctor was able to zoom in
Strongly agree	14	18	19	15	15	10
Agree	11	9	10	10	12	1
Neither agree nor disagree	1	0	0	1	1	5
Disagree	3	3	2	1	2	1
Strongly disagree	1	1	1	1	0	0
Do not know	2	0	0	3	1	1
Not Applicable	2	3	3	3	3	16
TOTAL	34	34	34	34	34	34

With the exception of the ability to zoom in (not applicable received the highest rating), the majority of participants across all the columns in **Table 88** strongly agreed that they were able to hear and see the doctor well, and vice versa. Some participants chose to comment on various issues and these are categorically presented below. The quotes that have been underlined have been stated by participants who were interviewed over a year after their telehealth consultation.

Connection was simple

“Strongly Disagree - didn’t work at all. Doctor had to give advise to nurse by telephone”. [P8]

“Disagree - the microphone did not work so we used the video and a telephone”. [P9]

“Agree - however nurses found it difficult to set up”. [P16]

“Disagree - still too new. Staff were struggling to get it up and running easily”. [P17]

“Agree - some initial connection problems with volume.” [P28]

“Disagree – connection took too long.” [P33]

Participant was able to see doctor clearly

“Disagree - Microphone did not work, but I could see and hear using a combination of phone and video”. [P9]

“Disagree -Couldn’t actually see Dr, screen wouldn’t work”. [P23]

“Agree - a bit less clear than a normal TV screen”. [P24]

Participant was able to hear doctor well

“Disagree – language difficulty”. [P16]

“Agree - required questions to be repeated at times as she couldn’t understand them”. [P28]

Doctor was able to see participant clearly

“Don’t know. I assume he could see me”. [P5]

“Strongly agree - ECGs were examined via the VC screen by the Dr as the ECG was held up to the screen”. [P17]

“Agree – required some adjusting.” [P31]

“Neither agree nor disagree – didn’t think the doctor could see how sick the patient looked by video”. [P32]

Doctor was able to hear participant well

“Strongly Disagree - Drs had to speak to nurse by telephone”. [P8]

“Agree - Dr could hear speech well enough but not the wheeze”. [P14]

“Agree - needed position changed to improve sound and visibility pickup”. [P18]

“Agree – needed different headset, then was great”. [P30]

Doctor was able to zoom in

“Strongly agree - but who knows if it was good picture or not”. [P16]

“Disagree - probably not. Very clear picture and sound”. [P21]

“Strongly agree - chest was visualised well”. [P23]

“Not applicable - a little bit of a delay in conversation waiting for speech to come through”. [P24]

“Neither agree nor disagree - Took a bit long to get connected about 10-15 minutes. No-ones fault”. [P29]

“Neither agree nor disagree – I had to move closer”. [P30]

“Agree – nurse assisted doctor to zoom camera”. [P32].

Based on the comments, there were some technical issues but these seemed to be resolved with ease. For instance, a phone call between the nurse at the referring hospital and the doctor when there were connectivity issues. Two participants [P16, P28] stated that they were unable to understand the doctor due to language difficulties or not being able to comprehend the question. These two issues may or may not be related to the technology. Participants seemed quite pleased with the visual aspect, although there seemed to be some issues with the clarity of the visual at times [P16, P23].

Lastly, participants were asked if they were comfortable being in front of a camera. As seen in **Table 89** the majority of participants (23 in both aspects) were comfortable with being in front of the camera and speaking on video. One participant [P14] stated that the patient (child) was not comfortable and “felt weird” being in front of the camera. Another participant said that speaking on video was similar to speaking on the telephone [P18]. So, overall, most participants were quite comfortable with the technology.

Table 89: Patients' comfort with being in front of camera

Comfort with being in front of camera	Number of participants
Yes	28
No	2
Not Applicable	4
TOTAL	34

Comfort with speaking on video	Number of participants
Yes	28
No	2
Not Applicable	4
TOTAL	34

Overall, participants seemed to be quite pleased with the technology in use, especially in relation to the quality of the voice and video. They were also quite comfortable with being in front of a camera. One participant [P30] commented that it was a bit weird as she had to undress herself, but the doctor made her feel very comfortable. Another participant commented that due to the patient's condition, the carer and patient felt uncomfortable [P33].

Resolving health issues and follow up

Continuity of care is being able to access integrated care that supports a person in improving their health status. Therefore, the following section presents data on whether the telehealth consultation had any effect on the issue that the participant was facing, whether medication was prescribed to help resolve the issue and whether the participant followed up with the General Practitioner (GP) at a later date.

Table 90 below provides a summary of the data for medication provision during the teleconsultation, whether the teleconsultation helped resolve symptoms and where there was a follow up with the GP.

Table 90: Medication provision during teleconsultation and follow up with GP (patients)

Medication provided during the telehealth consultation	
	Number of Participants
Yes	11
No	20
Not Applicable	1
Do not know	1
TOTAL	34
Treatment received during consultation resolved symptoms	
	Number of Participants
Strongly agree	14
Agree	10
Neither agree nor disagree	3
Disagree	2
Strongly disagree	1
Not Applicable	4
TOTAL	28
Follow up with General Practitioner (GP)	
	Number of Participants
Yes	23
No	10
Maybe	1
TOTAL	34

The majority of participants (20) had not received any medication during the telehealth consultation. Most (14) strongly agreed that the consultation resolved their issues. This showed that the technology was effective enough in resolving the issues. The majority of participants had a follow up appointment with their GP (23 in total). Quotes for the relevant sections have been provided below.

Prescription of medication

“Yes - pain relief given by nurse. I did not get a script to take home though.” [P10]

“No - Referral to GP in morning.” [P14]

“No - Rodipred dose given and advised to see GP next day to get script.” [P28]

Symptoms Resolved

“Neither agree nor disagree - Transferred to Albury Base for further assessment and treatment.” [P12]

“Agree - He presented with an ongoing issue - helped with pain relief at the time”. [P19]

“Neither agree not disagree-resolved the pain - short term but did not resolve the problem”. [P24]

Follow up with GP

"Yes - because he knows your history and he will have results of your visit to Wodonga and will explain in detail what you need to do." [P4]

"Yes - prescriptions, ongoing asthma management". [P8]

Yes- I decided myself to go to the GP because I wanted ongoing care for my leg and I felt that the telehealth doctor had made it clear that I needed to be seen in Wangaratta. My GP then arranged for me to go to Wangaratta." [P10]

"Yes - Albury hospital next day as still unwell and unable to diagnose". [P12]

"Yes - advised by ED doctor & to get script for nasal sprays - few days post presentation." [P14]

"Yes - Advised by EDMO to see GP in morning for further Ax and script for continuing steroids which they did." [P15]

"Maybe -went to NHW ED via private car. Was monitored and admitted overnight at NHW. Not referred to GP." [P18]

"Yes - GP within the next week to continue with ongoing care as recommended by the telehealth emergency department doctor" [P19]

"No - just needed analgesia. The issue is long term and didn't need follow up." [P20]

"Yes - as recommended to ensure medications working and eye improving." [P21]

"Yes - next monday - as recommended for follow up check as this was 3rd presentation and also another script for antibiotics as only given enough medications for weekend." [P21]

"Yes - recommended to get asthma management plan next day". [P23]

"Maybe -was admitted to Wodonga hospital." [P24]

"Yes - next day in Yarrawonga as recommended if condition was not improving. For prescription and exercises." [P25]

"Yes - went to GP next day for follow up and for script for prednisolone." [P26]

"Yes - at Shepparton next day. Got scripts required." [P27]

"Yes - Saw Yarrawonga GP next - for more assessment and script for Prednisalone. Also saw local GP at home." [P28]

"Yes - saw GP next am 8:30. GP admitted patient to hospital immediately. IV fluids given over 2 days." [P33]

Based on the quotes, medication may have been administered at the hospital with no follow up prescription. In regard to resolving symptoms, some relief was provided to participants who had long term issues. One participant [P12] had to be transferred to Albury Hospital to seek further treatment. In regard to GP visits, most comments were around reasons for seeing the GP. These range from the GP knowing the participant's history, to getting prescriptions, or just a follow up to ensure that the participant's health was improving. So, from a continuity of care perspective, the patient was given a prescription if required, and many a times, followed up with their GP.

Responsiveness (patients)

The service provided to the patient had to be client orientated. The patient must be treated with dignity and respect, privacy and confidentiality and be allowed to make decisions about the care they receive. In this analysis, responsiveness also included the participant's comfort with telehealth. If the service was client oriented, then comfort with using the technology must be considered.

Dignity and respect

Participants were asked to rate the extent to which they were treated with dignity and respect during the consultation (0 being no dignity and respect at all and 10 being complete dignity and respect). As seen in **Table 91** below, the majority of patients (17) felt that they were treated with dignity and respect.

Table 91: Patient treated with dignity and respect

Dignity and Respect	Number of Participants
0	1
5	1
6	1
7	3
8	2
9	1
10	20
N/A	5
TOTAL	34

Participant quotes are provided below:

"n/a - could only use telephone". [P8]

"10 - later stated that there were 2 children with croup and doctor saw both at same time but started with this patient so both families were next to each other on trolleys without curtaining in between. Mother stated this was ok as both kids had croup". [P14]

The second quote is based more on the way patients were placed in in the emergency department, rather than the telehealth consultation. Nevertheless, the participant seemed quite comfortable with the choice made by the staff members.

Confidentiality and Privacy

Participants were asked to rate the extent to which the telehealth consultation protected their privacy and confidentiality. Along with this, they were also asked whether they felt worried that the people around them may hear or see them on video. As can be seen in **Table 92** below, there was a correlation between the two factors – the majority of participants (18) provided a rating of 10, meaning that they felt that the consultation maintained their confidentiality and privacy. In line with this, 23 participants stated that they were not worried about people hearing or seeing them on video. It thus appears, that confidentiality and privacy were not issues, or may not be something that is thought of, during a telehealth consultation in an emergency situation.

Table 92: Extent to which teleconsultation protected patients’ privacy and confidentiality

Confidentiality and privacy	Number of Participants
6	1
7	1
8	4
9	2
10	22
N/A	4
TOTAL	34
Feel that people can hear or see video	Number of Participants
Yes	2
No	28
Not Applicable	4
TOTAL	28

Confidentiality and Privacy

“6 - Nurse and Dr present”. [P17]

“10-Did not feel uncomfortable at all during the proceedings”. [P18]

Worried about people hearing or seeing video

“Never thought about that.” [P6]

“No, but if more of a personal problem it may be an issue”. [P23]

“Yes at first, but the doctor handled it very well. I was completely comfortable because she said she would immediately turn off the camera if there was any noise or suggestion that someone was coming into the room”. [P30]

Based on the quotes, participants were quite comfortable during the consultation, in regard to their confidentiality and privacy being maintained, as well as being seen and heard via video. But, as one participants [P23] highlighted, this may depend on the type of problem being discussed.

Ability to make decisions about their care

Participants were asked to rate the extent to which they were allowed to make decisions about the care they received during the consultation. This to some extent, can be related to their confidence in the doctor overall, and their ability to make decisions and assess the participant's condition. Participants may feel more comfortable in discussing different options if they had confidence in the doctor's abilities. The summary of the data for their ability to make decisions about their care is presented in **Table 93**, followed by the data on their confidence in the doctor who assessed them.

Table 93: Patients' ability to make own decision about care

Ability to make decisions about care	Number of Participants
0	2
6	1
7	4
8	3
9	1
10	17
N/A	6
TOTAL	34

Related quotes:

"0 - only had one choice - had to drive to Wangaratta because telehealth system didn't work." [P8]

"10 - Patient knew what he needed already". [P16]

"0 - strongly believed the GP should be called in". [P33]

Most participants (17 in total) felt that they were able to make decisions about the care they received. However, one participant [P8] had an issue as he/she had to drive to Wangaratta to seek further treatment as the telehealth system did not work. **Table 94** summarises the level of confidence the participants had with the doctor doctor (0= no confidence at all, 10 = complete confidence).

Table 94: Confidence in doctor examining patient

Confidence in doctor examining participant	Number of participants
2	1
5	1
6	2
7	3
8	8
9	3
10	12
N/A	4
TOTAL	34
Confidence in doctor's decision making	Number of participants
1	1
2	1
6	1
8	10
9	3
10	12
N/A	4
No response	2
TOTAL	34
Accuracy of doctor's assessment	Number of participants
Yes	16
No	7
Not sure	7
N/A	4
TOTAL	34

As mentioned, 17 participants felt that they were able to make decisions and choices about the care they received. In line with this, as seen in **Table 94**, 12 participants were confident with the doctor examining them, 12 were pleased with their doctor's decisions and 16 felt that their assessment was accurate. There may be some correlation between the participant's perception of their ability to make decisions during the consultation and the confidence and comfort they have in doctors. The relevant quotes are provided below.

Confidence in doctor examining participant

"5 - Doctor wasn't really happy to examine me via telehealth." [P17]

"9 - Better in person where touch and feel is possible." [P23]

Confidence in doctor's decision making

"10 - Dr was reluctant to give Prednisone due to improving oxygen saturation levels and Dr needed to check children's hospital protocol." [P14]

"1 - No script given". [P16]

"10 - advised to go to Northeast Health Wangaratta". [P17]

"10 - nurses had already suggested croup which gave more confidence." [P28]

Accuracy of doctor's assessment

"Yes - with help from nurses." [P3]

"Not sure - depends if he was given the right information on your condition. They won't get it right every time." [P4]

"Not sure - Dr said herself that she couldn't really diagnose using telehealth. The doctor advised that I should come down to Wangaratta. The Corryong nurse kept saying that all I needed was pain relief. I felt that the nurse didn't really follow the doctor's instructions about transferring me. She got the pain relief prescription from the doctor and I was happy to have pain relief, but I was unhappy that she didn't organise for me to go to Wangaratta. I went to my own Dr the next day and it was organised that I go to Wangaratta. I have made a written complaint to Corryong about this." [P10]

"Not sure - assessment coincided with the nurses who actually are with me. Needs to be collaborative. The doctors and nurses need to be able to trust each other." [P11]

"No - No one could, as his condition wasn't properly diagnosed for a while even with face to face consultation." [P12]

"No - not 100% accuracy. Needed addition of nurses assessment skills. Also TV set up high - difficult to visualise child properly." [P14]

"No - needed more assessment like ECG and cardiac monitoring." [P17]

"Yes - with parental input and nurse assessment." [P21]

"No - no one could, even face to face but she could assess pain and need for further investigation." [P24]

"Not sure - particularly because the patient was a child." [P28]

"Not sure - Only going by what they've been told by the nurses though so it depends on that." [P29]

"No - felt that the Dr didn't understand how sick she was or how much pain she was in." [P33]

Based on the quotes, overall, participants seemed reasonably comfortable with the decisions made by the doctor. However, some participants [P3, P11, P14, P21, P29] acknowledge that the doctor needed the support of the nurse and when required, the carer to support the decision making process. This made it a bit easier for the doctor to assess the patient's condition. This may also be the case in face to face consultations, but perhaps more important when assessing a patient at a distance without the ability to touch or feel him/her.

Based on all this, that is, dignity and respect, confidentiality and privacy, ability to make decisions about care and comfort with technology, participants were asked whether they were happy to have a telehealth consultation. The data is summarised in **Table 95**. 23/34 patients were happy to have a telehealth consultation.

Table 95: Patients happy to have telehealth consultation?

Happy to have telehealth consultation	Number of participants
Strongly agree	23
Agree	8
Neither agree nor disagree	1
Disagree	1
Strongly disagree	1
TOTAL	34

Further Feedback on the telehealth consultation

Participants were asked questions that would prompt them to provide further feedback on the telehealth consultation. The responses are provided in the following section.

The participants were asked to comment on the differences between a face to face consultation with an emergency doctor and the telehealth consultation, and whether the outcome was similar (**Table 96**).

Table 96: Further feedback on telehealth consultation (patients)

Comparison to face to face consultation	Number of participants
Much better	0
Better	2
The same	18
Worse	6
Much worse	1
I don't know	3
Not Applicable	4
TOTAL	34
Effectiveness of medical consultation	Number of participants
Very effective	13
Effective	15
Ineffective	1
Highly ineffective	1
Not Applicable	4
TOTAL	34
Feeling towards having telehealth at local hospital	Number of participants
More comfortable to come straight to my local hospital when I need help	25
Prefer to wait until the GP is back on duty	0
Travel directly to the largest regional hospital	2
Call an ambulance instead of going to my local hospital	2
Not seek medical care at all	0
Hasn't changed how I make decisions about seeking medical help	4
I don't know	0
Depends on medical issue	1
TOTAL	34

Comparison to face to face consultation

"The same, but would have liked face to face". [P3]

"The same - always depends on the case. In my particular case it was the same" [P11]

"The same - different process, similar end result" [P18]

"The same except face to face would have been better but as an alternative this was great". [P23]

"The same - outcome is the same but assessment was more difficult especially with respiratory disorders." [P14]

"Better - quicker access. Handy having nursing staff present as well to fill in history and symptoms on patient's behalf as she was too unwell to verbalise much." [P13]

"Better than no doctor at all! otherwise the same." [P25]

"Worse - pointless to use telehealth for this situation, that is cardiac. Nurses should have just advised patient to attend ED at NHW." [P17]

"Worse - loss of personal touch but end result was the same." [P21]

"Worse - not physically there - missed that assessment opportunity which is to be expected." [P24]

"I don't know - more comfortable with GP present." [P28]

"The same - prefer a face to face with a doctor but the nurses were very good and overall it worked really well." [P29]

"The same - fantastic. Forgot about the camera after a while." [P30]

The majority of participants (18) felt that the telehealth service was similar to a face to face consultation with an emergency doctor. In line with this finding, the majority of them found the service to be effective (13) and stated that they would go to their local hospital when they needed access to healthcare services (25). Two participants, [P21, P24, P28] commented that the service was worse due to the loss of personal touch and that he/she would be more comfortable if the GP was present. However, when their rating for the effectiveness of telehealth is taken into consideration, both participants had provide a rating of very effective [P21, P24] and effective [P28]. When asked how they felt about telehealth being provided at their local hospital, 2 [P21, P24] out of the 3 participants said that they would be more comfortable seeking help at the local hospital. The other participant [P28] stated that it would depend on the medical situation.

So, overall, most of the participant realised and acknowledged the value of the telehealth service, at a time when face to face consultations with a doctor may not be accessible or possible.

Level of satisfaction with service

Table 97: Level of satisfaction with teleconsultation (patients)

Level of satisfaction	Number of participants
Very satisfied	18
Satisfied	11
Neither satisfied nor dissatisfied	0
Dissatisfied	0
Very dissatisfied	1
Not applicable	4
TOTAL	34
Use service again	Number of participants
Yes	33
No	1
Maybe	0
TOTAL	34
Recommend service to others	Number of participants
Yes	33
No	1
Maybe	0
TOTAL	34

Participants were asked to rate their level of satisfaction with the service, and whether they would use the service again and recommend it to others. In this study, satisfaction was an overall rating based on accessibility, continuity of care and responsiveness. Its definition was limited and defined by these constructs.

The majority of participants (18 in total) were very satisfied with the service. 33 of them would use the service again and the same number of participants would recommend the service to others. One participant [P33] commented that he/she would recommend it for minor problems. So, in summary, telehealth was seen to improve accessibility, continuity of care and responsiveness. In spite of some technical glitches and problems with the service provided in the local hospital emergency department, participants seemed to be quite satisfied with the service and consider it valuable.

Finally, participants were asked to provide feedback on their telehealth experience and comments on how the service can be improved.

Experience with telehealth

The positives

“Family were very impressed with service. Patient was too unwell to take much in.” [P12]

“Mother (ex nurse) and patient were exceptionally impressed with telehealth service and grateful for expedience of care. Say it is an excellent and necessary service for regional communities.” [P13]

“Beautiful service. Every hospital should have one.” [P20]

"Telehealth service also is valuable for the nurses too as they are supported and also exposed to assessment by doctors (education)." [P24]

"Amazed how good the system worked. very grateful for expediency of service." [P25]

"Despite not actually getting to use the telehealth system, mother is positive about the benefits of it compared to previous situation of having to either travel 45-60 mins to Shepparton/Wangaratta hospitals or expensive call out fees for local GP." [P27]

"Really happy with the consultation. A great service to have." [P32]

The negatives

"Not the same as a face to face consult." [P5]

"Mother's opinion on effectiveness and confidence with telehealth would be more positive if the consultation had been for her and not for her 2 y/o as a child is unable to explain and describe symptoms compared with an adult." [P28]

"Telehealth system didn't work, so had to drive to Wangaratta. My medication was out of date. When I got to Wangaratta I got very good treatment. it was great. I was disappointed I couldn't get the care I needed locally. I think it is dangerous to have to drive to Wangaratta." [P8]

Feedback about the staff

"The two nurses in attendance were excellent. Especially as I was sure insects were burying into me - they were very comforting." [P3]

"Nurses very helpful and supportive." [P21]

"Story: Nurse were gems - 100%. All patient needed was a visualisation of eye to double check foreign object had been removed (patient had removed foreign object himself) and a script for antibiotic ointment. However ED doctor wanted patient to present to NHW ED and insisted (which was a 10hour round trip for patient) as he was concerned about eye and refused to provide script for antibiotic cream. -->dissatisfied with attitude of ED doctor - states Dr was caring but incompetent. Patient believes telehealth is a good OPTION for the community. Would be better if medical Drs were English speaking (1st language) and proficient. Ensure UCC's are supplied with required medications that may be prescribed." [P16]

"Respondent felt everyone respectful but missed the point on needing the GP to review the patient face to face. Thinks it would be a great system for less serious things. Fantastic." [P33]

Comments about the Procedures in Place

"The concept is great and she would utilise it however has vowed never to attend Yarrawonga hospital in the after-hours again. She said she overheard issues with the email not having been received the second time hence the extended wait time of 1 hour. The story: 1st presentation: gall bladder attack and realised she would have to wait - went home to take analgesia instead of waiting the 1/2 hour to see if it worked. 2nd presentation: represented after oral pain medication was ineffective. Had to redo paperwork again --> vomiting, nauseated, pain 10/10. Needed Intramuscular Injection analgesia as per usual routine. Nurses were rude. 1 1/2 hr wait to see doctor. But did not see Doctor - phone order was received by nurses who administered the required medication and then kept her in to observe overnight." [P22]

"Videoconference was not commenced as the Emergency department doctor and nurse decided it was unnecessary at the time." [P26]

Opinion of improvements to telehealth service

The positives

"Nothing - it was great to use. Very helpful." [P2]

"I think it's great. Thankyou for the service. In the future i would definitely access telehealth. In the past I have had to drive to Wangaratta." [P7]

"Not yet - he has not used the service enough. His trust is placed in the staff who manage the service as they are the experts." [P18]

"Not really. It works great the way it is." [P21]

"No ideas to improve service - staff used it effectively." [P28]

The negatives

"The actual linking up was messy - will it work? When will they link up? I however realise my condition was not a priority." [P3]

"No not really - just the problem on my occasion was that the microphone was not working." [P9]

Feedback about staff

"No TH still new at the time. Staff should now be a little more familiar with the setup." [P15]

"Needs confident practitioners because all skills are not able to be used R/T. not being present physically eg hearing, feeling, smelling. 2 - ongoing training day for nurses to be efficient in setup of T/H. 3 - for zooming extra small camera to bring camera to patient rather than patient to the screen." [P16]

"No. more training - staff were not familiar at time with the hook up process - may be better now." [P17]

"Nurses attitude, communication and consideration would make a big difference." [P22]

"More education for nurses and doctors in use of equipment (relates to zooming of camera). Ensure patients get enough information." [P32]

Comments about procedures in place

"Better explanation about how the waiting system works in terms of queueing at Wangaratta ED. 2 - ensuring that the local nurse is not telling the Dr what is needed rather than the patient themselves communicating what they need to the Dr." [P10]

"Lower TV and make it closer to patient ie within 2 feet and in front of pt (maybe staff were unable to reset TV height). Thought it may have been fixed to ceiling or something - couldn't really remember. But positioning was an issue for interacting with a child and to hear wheeze." [P14]

"Prescriptions - make pharmacy aware of the service. There was an issue with the faxed scripts. Educate the pharmacies about telehealth." [P30]

"Better information needed. Friction - calling GP. Time taken to get up and running too long (VC unit). RNs hesitate to call doctors." [P33]

As can be seen, the feedback on the telehealth service and opinions around how this service could be improved could be categorised as positives, negatives, feedback about staff and feedback about procedures in place. Although the value of telehealth was mentioned, there was acknowledgement that some of the procedures may need to be improved and staff may need to be trained better so that communication with the patient improved, and the correct types of patients were referred to health. Some of the procedures were not related to telehealth, but the process followed to treat the patient. This process may have been the same if the patient was seen face to face.

Overall, it can be said that patients were quite pleased with the telehealth service. They did not have to wait too long to access the service, and it was provided free of cost to them. Some faced technical glitches but these seemed to be minor in the light of things. Most found that they were treated with dignity and respect, the consultation maintained confidentiality and privacy and they were allowed to make decisions about the care they received. Some would have preferred a face to face consult but still found that the telehealth consultation was effective, and they were relieved of their symptoms.

The participants did comment on the attitudes of staff and some procedures in place, not necessarily in relation to telehealth, but the emergency department at their local hospital.

Appendix K: Data Collection Instruments

Survey Questionnaire – Junior Medical Officers

Telehealth in rural emergency departments: Medical Officers Questionnaire

Background Information

1. Which of the following best describes your employment status?

Fulltime

Parttime

2. What is/was your work title at NHW :How long have you worked as a doctor?

3. What is your age? 21-30 31-40 41-50 51-60 61-70

4. What is your gender? Female Male

5. How many weeks, months or years have/did you worked in the ED or Urgent Care Centre (UCC)?

6. Have you used the Telehealth system?

Yes

No

If yes, how many times?

7. How recently did you use it?

Today

A few days ago

A few weeks ago

Several Months ago

Please go to question 8

7a *If no, have you had the opportunity to use it?*

Yes

If yes, can you explain why Telehealth could have been used but was not?

No

Thank-you, there are no more questions

The following sections are for doctors who have used the Telehealth system

Preparing for Telehealth

8. I have/had a clear set of guidelines to direct me about **how to set up** a Telehealth consultation for my patient

True

False

Not sure

9. I have received training in the use of Telehealth equipment

True

False

Not Sure

10. I have/had training in **how to undertake** a Telehealth consultation with a patient (physical examination history taking)

True

False

Not Sure

If yes, please describe briefly what this training involved.

11. I have a clear set of guidelines to direct me about how to **undertake** a Telehealth consultation with a patient

True

False

Not sure

Technology Related Questions

12. Connecting to the internet/site for a Telehealth consultation is straightforward and simple

- Always
- Most of the time
- Occasionally
- Never

13. When the Telehealth system is set up and connected, the clarity of *vision* is consistently

- Very good
- Good
- Poor
- Very Poor

14. When the Telehealth system is set up and connected, the clarity of *sound* is consistently

- Very good
- Good
- Poor
- Very Poor

Please comment on any issues with connection, sound or vision

Your experiences using Telehealth

15. Prior to working in the ED at NHW, had you ever consulted a patient using Telehealth?

- Yes
- No

16. Did you have supervision from a more senior doctor when undertaking your first Telehealth consultation?

- Yes
- No

17. When examining a patient using Telehealth I get the assistance I need from the referring hospital staff

Strongly Agree	<input type="checkbox"/>
Agree	<input type="checkbox"/>
Neither agree nor disagree	<input type="checkbox"/>
Disagree	<input type="checkbox"/>

18. How confident did you feel about examining a patient using Telehealth, before your first Telehealth consultation

Please mark on the line with a number

0-----10
No confidence at all Complete confidence

19. How confident do you feel about making clinical decisions using Telehealth now?

Please mark on the line with a number

0-----10
No confidence at all Complete confidence

20. I feel stressed when treating patients using the After Hours Telehealth System

Strongly Agree	<input type="checkbox"/>
Agree	<input type="checkbox"/>
Neither agree nor disagree	<input type="checkbox"/>
Disagree	<input type="checkbox"/>
Strongly Disagree	<input type="checkbox"/>

21. Please tell us about any factors which impact on your confidence with clinical care using Telehealth

22. What aspects of your patient consultation are more difficult using Telehealth than if the patients were present in the ED? Why?

Accessibility Questions

23. Did any of the following cultural factors have a positive or negative effect on your capacity to treat a patient using the Telehealth service?

23a Aboriginal or Torres Strait Islander descent

Yes

No

I have not had the opportunity to use Telehealth with people in this group

23b Non-English Speaking Background

Yes

No

I have not had the opportunity to use Telehealth with people in this group

23c Did the age of the patient make any difference?

Yes

No

If yes what was it about the patient's age that impacted on the Telehealth consultation?

24. Did some patients have a carer with them during the Telehealth consultation?

Yes

No

24a. if yes please tell us how effective Telehealth was when working with a patient and their carer

Very effective

Effective

Ineffective

Highly ineffective

25. Did the Telehealth system have any influence on decisions to transfer or not to transfer a patient by ambulance from the outlying hospital to your hospital?

Yes

No

If yes please tell us about this

Responsiveness Questions

26. To what extent do you think the patients are treated with dignity and respect in the Telehealth consultation? Please mark on the line with a number

0-----10

No dignity & respect at all

Complete dignity & respect

27. To what extent does the Telehealth consultation protect the privacy and confidentiality of the patient? Please mark on the line with a number

0-----10

No privacy at all

Complete privacy

28. To what extent does the Telehealth consultation help the patient make their own decision and choices about care? Please mark on the line with a number

0-----10

Patient unable to make choices

Patient completely able to make a choice

29. Patients who use the Telehealth system are generally

Very satisfied

Satisfied

Neither satisfied nor dissatisfied

Very Dissatisfied

Continuity of Care Questions

30. Do you advise the patient to follow up with their usual GP after a Telehealth consultation?

- Always
- Sometimes
- Never

31. Do you send a letter to the patient's usual GP after a Telehealth consultation?

- Always
- Sometimes
- Never

Workplace relationships

32. How confident do you feel about the staff at the referring hospital undertaking your clinical instructions using Telehealth?

Please mark on the line with a number

0-----10
No confidence at all Complete confidence

33. How do you feel about the support you are given by clinical staff at the referring site?

Please mark on the line with a number

0-----10
No support at all Complete support

34. The clinical information for Telehealth patients is always communicated to me clearly

- Strongly agree
- Agree
- Disagree
- Strongly Disagree

35. I receive the clinical documentation I require for a Telehealth consultation in a timely manner

- Strongly agree
- Agree
- Disagree
- Strongly Disagree

36. After a Telehealth consultation I am able to complete the necessary paperwork for the referral hospital in a timely manner

- Strongly agree
- Agree
- Disagree
- Strongly Disagree

37. I make prescribing decisions for Telehealth patients in the same way as I do for face to face consultations

- Strongly Agree
- Agree
- Neither agree nor disagree Disagree
- Strongly Disagree

38. Any other comments about your experience of Telehealth:

Thank you for your time in completing this questionnaire .

Telehealth Senior Doctors Survey

Welcome to our survey about using the AFTER HOURS Telehealth Service in rural Urgent Care Centres (UCCs) and emergency departments. This survey is part of an overarching research project called 'Telehealth in Rural Emergency Departments' and is being conducted by the University of Melbourne Rural Health Academic Centre in partnership with Northeast Health Wangaratta

By completing this survey you are assisting us gain a better understanding of the experiences of Senior Doctors when using the AFTER HOURS TELEHEALTH service.

If you start the survey and then wish to come back and complete it later you can do so by clicking on the 'save and return' tab at the bottom of the page.

Before we get started there are few formalities we need to complete.

Please check the box below to indicate that you consent to participate in this research project and in doing so agree to the following:

- * I understand that the information I supply in this questionnaire is for the research purposes of evaluating the After Hours Telehealth Project.
- * I understand that my responses to the questionnaires are not identifiable and are pooled with all other respondents therefore once submitted the research team are unable to remove my responses.
- * I agree to take part in the research project and understand that I may be contacted again for further follow-up.

I consent to take part in this project

- Yes
- No

Background Information about you

What is today's date?

What health service do you work for?

- Wangaratta
- Goulburn Valley Health
- Albury Wodonga Health
- Benalla
- Corryong
- Seymour
- Mansfield
- Myrtleford
- Bright
- Mt. Beauty
- Yarrawonga
- Cobram
- Violet Town
- Euroa
- Alexandra
- Numerkah
- Nathalia
- Other

Please name your Health Service

Which of the following best describes your employment status?

- Full Time
- Part time
- Casual

What type of shifts do you regularly work ?

- Day shift
- Afternoon shift
- Night shift
- Weekdays
- Weekends

How many years have you worked as a doctor ?

How many years have you worked as a doctor at your CURRENT health service ?

How often do you work in the ED ?

- Always
- Frequently
- Occasionally
- Never
- I haven't yet but I may do so in the future

What is your age ?

Are you

- Male
- Female

I am responsible for supervising junior doctors generally in ED

- Yes
- No

I am responsible for training Junior Doctors in the Use of the After Hours Telehealth Service

- Yes
- No

When training the junior doctors in Telehealth I use the training materials provided

- Always
- Sometimes
- Never

How confident do you feel about Junior Doctors making clinical decisions using the After Hours Telehealth Service ?

Not at all confident Completely Confident

=====

The After Hours Telehealth service and your local community

The community members who access our health service are aware we have an After Hours Telehealth service

- Strongly Disagree
- Disagree
- Agree
- Strongly Agree
- I don't know

Effectiveness: Tell us about your experience with the After Hours Telehealth System

Have you used the After Hours Telehealth system?

- Yes
 No

If you have NEVER used the Telehealth Service was this because

- I have not been on duty when a suitable patient presented after hours
 The patient was suitable but refused Telehealth
 The patient was suitable and agreed but the system did not work
 I had an opportunity to use Telehealth for a suitable patient but I did not feel confident to do so.
 I had not undertaken training to use Telehealth

How many times have you used the After Hours Telehealth system ?

How recently have you used the After Hours Telehealth service ?

- Today
 A few days ago
 A few weeks ago
 Several months ago
 More than one year ago

I have a clear set of guidelines about what PATIENTS are SUITABLE for after hours Telehealth

- Strongly Disagree
 Disagree
 Neither disagree nor agree
 Agree
 Strongly agree

I have a clear set of guidelines to direct me about HOW to set up the EQUIPMENT for a Telehealth consultation for my patient

- Strongly Disagree
 Disagree
 Neither Disagree nor Agree
 Agree
 Strongly Agree

I have a clear set of guidelines detailing the PAPERWORK required for a Telehealth consultation

- Strongly Disagree
 Disagree
 Neither Disagree nor Agree
 Agree
 Strongly Agree

I have received education and training in all aspects of using the After Hours Telehealth System

- Yes
 No

The education and training I received completely prepared me for undertaking an after hours Telehealth Consultation

- Strongly Disagree
 Disagree
 Neither Disagree nor Agree
 Agree
 Strongly Agree
 I did not receive any education nor training

Do you require further education training in Telehealth ?

- Yes
 No

What further education and training would be useful ?

Connecting to the internet for a Telehealth consultation is straightforward and simple

- Strongly Disagree
 Disagree
 Neither disagree nor agree
 Agree
 Strongly Agree

When the Telehealth system is set up and connected, the clarity of VISION is consistently good

- Strongly Disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

When the Telehealth system is set up and connected, the clarity of SOUND is consistently good

- Strongly Disagree
- Disagree
- Neither disagree nor agree
- Agree
- Strongly Agree

Please add any comments you may have about the quality of the connection, quality of sound or vision.

Accessibility of the system for my patients

Please list the clinical scenarios that you have used the Telehealth System for :

Does belonging to any any of the following groups NEGATIVELY impact the quality of care a patient receives when accessing the Telehealth service? Choose as many that apply.

- Very elderly
- Very young (ie baby, infant)
- Identifying as Aboriginal or Torres Strait Islander
- Belonging to a CALD group
- None of the above

Please give examples of any issues you have encountered with people in any of these groups

Please list the clinical scenarios you believe work best for After hours Telehealth

Please tell us about any clinical situations using After Hours Telehealth that have NOT worked well

How often do you use the Telehealth service for the PRIMARY PURPOSE of prescribing a medication for a patient

- Always
- Often
- Sometimes
- Never

In your experience, how important is the After Hours Telehealth System in reducing AMBULANCE transfers from the UCC to the regional hospital?

- Very important
- Important
- Unsure
- Makes no difference

In your experience, how important is the After Hours Telehealth System in reducing PRIVATE CAR transfers from the UCC to the regional hospital?

- Very important
- Important
- Unsure
- Makes no difference

Safety

To what extent do you think the patients are treated with 'dignity and respect' in the Telehealth consultation? Please mark on the line

Not at all Completely

(Place a mark on the scale above)

To what extent does the Telehealth consultation protect the 'privacy and confidentiality' of the patient? Please mark on the line

Not at all Completely

(Place a mark on the scale above)

To what extent does the Telehealth consultation help the patient 'make their own decisions and choices' about their care? Please mark on the line

Not at all Completely

(Place a mark on the scale above)

When thinking about the communication between YOURSELF and the Telehealth team at the outlying UCCs, to what extent are YOU treated with dignity & respect? Please mark on the line

Not at all Completely

(Place a mark on the scale above)

The clinical history for Telehealth patients is communicated to me clearly by the UCC nurses.

- Always
- Mostly
- Never

The essential paperwork is sent to me from the UCCs in a timely manner

- Always
- Mostly
- Never

Have you experienced any difficulties with the nurses assisting you with the physical examination of the patient ?

- Yes
- No

Please describe any issues you have encountered with the physical examination of the patient when using Telehealth.

How confident do you feel about the UCC nurses assisting you with the physical examination of the patient ?

Not at all confident Completely Confident

(Place a mark on the scale above)

How confident do you feel about making clinical decisions when using the After Hours Telehealth Service ?

Not at all confident Completely Confident

(Place a mark on the scale above)

How confident do you feel about the nurses at the UCC following your clinical directives after the Telehealth consultation is completed ?

Not at all confident Completely Confident

(Place a mark on the scale above)

I feel stressed when caring for patients using the Telehealth System

- Strongly Disagree
- Disagree
- Neither disagree nor agree
- Agree
- Strongly Agree

The After Hours Telehealth service has increased the workload in my ED department

Not at all Very much



(Place a mark on the scale above)

Continuity of Care

Do you send a letter to the patient's usual GP after a Telehealth consultation?

- Always
- Sometimes
- Never
- Not sure

Do you advise Telehealth patients to have follow-up care with their regular GP ?

- Never
- Sometimes
- Always

Satisfaction

In general patients who use the Telehealth system appear to be

- Very dissatisfied
- Dissatisfied
- Neither dissatisfied nor satisfied
- Satisfied
- Very satisfied

Overall I believe the after hours Telehealth service is a working well at my health service

- Strongly Disagree
- Disagree
- Neither disagree nor agree
- Agree
- Strongly Agree

The After Hours Telehealth Service is sustainable in my workplace

- Strongly Disagree
- Disagree
- Neither disagree nor agree
- Agree
- Strongly Agree

Do you use the Telehealth Equipment for purposes other then After Hours support to the UCCs ?

- Yes
- No

What other purposes have you used the Telehealth equipment for ?

Please use this space to tell us anything else you wish about your experiences of After Hours Telehealth

Telehealth Nurses Survey

Welcome to our survey about using the AFTER HOURS Telehealth Service in rural Urgent Care Centres (UCCs) and emergency departments. This survey is part of an overarching research project called 'Telehealth in Rural Emergency Departments' and is being conducted by the University of Melbourne Rural Health Academic Centre in partnership with Northeast Health Wangaratta

By completing this survey you are assisting us gain a better understanding of the experiences of NURSES in the Urgent Care Centres when using the AFTER HOURS TELEHEALTH service.

If you start the survey and then wish to come back and complete it later you can do so by clicking on the 'save and return' tab at the bottom of the page.

Before we get started there are few formalities we need to complete.

Please check the box below to indicate that you consent to participate in this research project and in doing so agree to the following:

- * I understand that the information I supply in this questionnaire is for the research purposes of evaluating the After Hours Telehealth Project.
- * I understand that my responses to the questionnaires are not identifiable and are pooled with all other respondents therefore once submitted the research team are unable to remove my responses.
- * I agree to take part in the research project and understand that I may be contacted again for further follow-up.

I consent to take part in this project

- Yes
- No

Background Information about you

What is today's date?

What health service do you work for?

- Wangaratta
- Goulburn Valley Health
- Albury Wodonga Health
- Benalla
- Corryong
- Seymour
- Mansfield
- Myrtleford
- Bright
- Mt. Beauty
- Yarrawonga
- Cobram
- Violet Town
- Euroa
- Alexandra
- Numerkah
- Nathalia
- Other

Please name your Health Service

Which of the following best describes your employment status?

- Full Time
- Part time
- Casual

What type of shifts do you regularly work ?

- Day shift
- Afternoon shift
- Night shift
- Weekdays
- Weekends

Please indicate your nursing registration level

- Division 1
- Division 2

How many years have you worked as a nurse ?

How many years have you worked as a nurse at your CURRENT health service ?

How often do you work in the Urgent Care Centre /ED

- Always
- Frequently
- Occasionally
- Never
- I haven't yet but I may do so in the future

What is your age ?

What is your gender ?

- Male
- Female

The After Hours Telehealth service and your local community

The community members who access our health service are aware we have an After Hours Telehealth service

- Strongly Disagree
- Disagree
- Agree
- Strongly Agree
- I don't know

In my experience, the community members who access our health service after hours seem willing to have a Telehealth consultation

- Strongly Disagree
- Disagree
- Agree
- Strongly Agree
- I don't know

Effectiveness: Tell us about your experience with the After Hours Telehealth System

Have you used the After Hours Telehealth system?

- Yes
 No

If you have NEVER used the Telehealth Service was this because

- I have not been on duty when a suitable patient presented after hours
 The patient was suitable but refused Telehealth
 The patient was suitable and agreed but the system did not work
 I had an opportunity to use Telehealth for a suitable patient but I did not feel confident to do so.
 I had not undertaken training to use Telehealth

How many times have you used the After Hours Telehealth system ?

How recently have you used the After Hours Telehealth service ?

- Today
 A few days ago
 A few weeks ago
 Several months ago
 More than one year ago

I have a clear set of guidelines about what PATIENTS are SUITABLE for after hours Telehealth

- Strongly Disagree
 Disagree
 Neither disagree nor agree
 Agree
 Strongly agree

I have a clear set of guidelines to direct me about HOW to set up the EQUIPMENT for a Telehealth consultation for my patient

- Strongly Disagree
 Disagree
 Neither Disagree nor Agree
 Agree
 Strongly Agree

I have a clear set of guidelines detailing the PAPERWORK required for a Telehealth consultation

- Strongly Disagree
 Disagree
 Neither Disagree nor Agree
 Agree
 Strongly Agree

I have received education and training in all aspects of using the After Hours Telehealth System

- Yes
 No

The education and training I received completely prepared me for undertaking an after hours Telehealth Consultation

- Strongly Disagree
 Disagree
 Neither Disagree nor Agree
 Agree
 Strongly Agree
 I did not receive any education nor training

Do you require further education training in Telehealth ?

- Yes
 No

What further education and training would be useful ?

Contacting the referral hospital to ARRANGE a Telehealth consultation for my patient is straightforward and simple

- Strongly Disagree
 Disagree
 Neither disagree nor agree
 Agree
 Strongly Agree

Connecting to the internet for a Telehealth consultation is straightforward and simple

- Strongly Disagree
- Disagree
- Neither disagree nor agree
- Agree
- Strongly Agree

When the Telehealth system is set up and connected, the clarity of VISION is consistently good

- Strongly Disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

When the Telehealth system is set up and connected, the clarity of SOUND is consistently good

- Strongly Disagree
- Disagree
- Neither disagree nor agree
- Agree
- Strongly Agree

Please add any comments you may have about the quality of the connection, quality of sound or vision.

Accessibility of the system for my patients

Does belonging to any any of the following groups NEGATIVELY impact the quality of care a patient receives when accessing the Telehealth service? Choose as many that apply.

- Very elderly
 Very young (ie baby, infant)
 Identifying as Aboriginal or Torres Strait Islander
 Belonging to a CALD group
 None of the above

Please give examples of any issues you have encountered with people in any of these groups

Were there any factors related to the patient's usual GP that impacted on you deciding to use or not use the Telehealth system?

- Yes
 No

Please describe factors or issues related to the patient's GP that impacts your decision making in regard to the After Hours Telehealth system

What is the average wait time for patients from ARRIVAL at the UCC until they are REFERRED for a Telehealth consult ?

What is the average wait time from when you make the Telehealth REFERRAL until the patient is SEEN by the Telehealth doctor ?

Please describe the clinical diagnoses/scenarios that you have used the Telehealth System for :

Please tell us the situations you believe work best for After hours Telehealth

Please tell us about clinical situations that you have referred for After Hours Telehealth that have NOTworked well

How often do you use the Telehealth service for the PRIMARY PURPOSE of obtaining a medication order / prescription for your patient

- Always
 Often
 Sometimes
 Never

In your experience, how important is the After Hours Telehealth System in reducing AMBULANCE transfers from your UCC to the regional hospital?

- Very important
 Important
 Unsure
 Makes no difference

In your experience, how important is the After Hours Telehealth System in reducing PRIVATE CAR transfers from your UCC to the regional hospital?

- Very important
 Important
 Unsure
 Makes no difference

Please tell us about any important issues you or your patients face in regard to transfers to the regional hospital

Now that you have an After Hours Telehealth service, in your opinion what impact has this had on numbers of patients attending the UCC ?

- Patients are MORE likely to come into the UCC
 Patients are LESS likely to come into the UCC
 It makes no difference

Safety

How confident do you feel with the Telehealth doctor's decisions and instructions?

No confidence at all Completely Confident

(Place a mark on the scale above)

Please tell us about any factors which impact on your confidence with the Telehealth doctors decisions and instructions

How often does the doctor prescribe medications for your patient ?

- Always
- Often
- Sometimes
- Never

To what extent do you think the patients are treated with 'dignity and respect' in the Telehealth consultation? Please mark on the line

Not at all Completely

(Place a mark on the scale above)

To what extent does the Telehealth consultation protect the 'privacy and confidentiality' of the patient? Please mark on the line

Not at all Completely

(Place a mark on the scale above)

To what extent does the Telehealth consultation help the patient 'make their own decisions and choices' about their care? Please mark on the line

Not at all Completely

(Place a mark on the scale above)

When thinking about the communication between YOURSELF and the Telehealth team at the regional health service, to what extent are YOU treated with dignity & respect? Please mark on the line

Not at all Completely

(Place a mark on the scale above)

How confident do you feel about assisting the Telehealth doctor with the physical examination of the patient. Please mark on the line below

Not at all confident Completely Confident

(Place a mark on the scale above)

Have you experienced any difficulties in assisting the Telehealth doctor with physical examination of the patient ?

- Yes
- No

Please describe any issues you have encountered in assisting with the physical examination of the patient when using Telehealth

The clinical care plan for Telehealth patients is communicated to me clearly

- Always
- Mostly
- Never

The essential paperwork is sent to me from the Telehealth doctor in a timely manner

- Always
- Mostly
- Never

I feel stressed when caring for patients using the After Hours Telehealth System

- Strongly Disagree
- Disagree
- Neither disagree nor agree
- Agree
- Strongly Agree

How confident do you feel about making clinical decisions when using Telehealth. Please mark on the line below

Not at all confident Completely Confident



(Place a mark on the scale above)

Having access to the After Hours Telehealth System at the UCC has improved my capacity to provide high quality patient care

- Strongly Disagree
- Disagree
- Neither disagree nor agree
- Agree
- Strongly Agree

Continuity of Care

Do the patients ROUTINELY follow up with their usual GP in regular office hours after a Telehealth consultation?

- Always
- Sometimes
- Never
- Not sure

Is there a letter sent to the patient's usual GP after a Telehealth consultation?

- Always
- Sometimes
- Never
- Not sure

Satisfaction

In general patients who use the Telehealth system appear to be

- Very dissatisfied
- Dissatisfied
- Neither dissatisfied nor satisfied
- Satisfied
- Very satisfied

Overall I believe the after hours Telehealth service is a working well at my health service

- Strongly Disagree
- Disagree
- Neither disagree nor agree
- Agree
- Strongly Agree

Please use this space to tell us anything else you wish about your experiences of After Hours Telehealth

General Practitioner Interview Questions

1. In the past 12 months, of all the patients/clients you have seen, what proportion or number of them would have utilised telehealth for after-hours care? <1% etc.
2. Before this telehealth service, what proportion of time would you spend in providing after-hours care? That is how many weekends per year, after-hours on weeknights?
3. Since patients started using telehealth for after-hours care, what proportion of your time would you spend providing this care?
4. Based on the patients that came to you for a follow up after a telehealth consult, did you feel that the treatment they received via telehealth was appropriate?
5. Have you received any feedback from the patients that used telehealth? Accessing care, receiving uninterrupted care, privacy, confidentiality, being treated with dignity and respect, makes choices related to their care.
6. Should the service be continued? Expanded?
7. Is there any feedback that you would like to provide about telehealth?

Telehealth Administrative Staff Survey

Welcome to our survey about using the AFTER HOURS Telehealth Service. This survey is part of an overarching research project called 'Telehealth in Rural Emergency Departments' and is being conducted by the University of Melbourne Rural Health Academic Centre in partnership with Northeast Health Wangaratta. By completing this survey you are assisting us gain a better understanding of the experiences of Administration Staff who help run the service

Please note that if you start the survey and then wish to come back and complete it later you can do so by clicking on the save and return tab at the bottom of the page.

Before we get started there are few formalities we need to complete. Please check the box below to indicate that you consent to participate in this research project and in doing so agree to the following:

*I understand that the information I supply in this questionnaire is for the research purposes of evaluating the After Hours Telehealth Project.

*I understand that my responses to the questionnaires are not identifiable and are pooled with all other respondents therefore once submitted the research team are unable to remove my responses.

*I agree to take part in the research project and understand that I may be contacted again for further follow-up.

I consent to take part in this project

- Yes
 No

Background Information about you

What is today's date?

What health service do you work for?

- Wangaratta
- Goulburn Valley Health
- Albury Wodonga Health
- Benalla
- Corryong
- Seymour
- Mansfield
- Myrtleford
- Bright
- Mt. Beauty
- Yarrawonga
- Cobram
- Violet Town
- Euroa
- Alexandra
- Numerkah
- Nathalia
- Other

Please name your Health Service

How long have you worked in your current role at this health service?

- Less than 6 months
- 6 months - 1 year
- Between 1 - 5 years
- More than 5 years

Which of the following best describes your employment status?

- Full Time
- Part time
- Casual

What type of shifts do you regularly work ?

- Day shift
- Afternoon shift
- Night shift
- Weekdays
- Weekends

How often do you work in the ED /Urgent Care Centre

- Always
- Frequently
- Occasionally
- Never
- I haven't yet but I may do so in the future

What is your age ?

What is your gender ?

- Male
- Female

Guidelines and training

Have you been involved in the use of the After Hours Telehealth service ?

- Yes
 No

If you have NEVER used the Telehealth Service was this because

- I have not been on duty when a Telhealth referral came through
 I have not undertaken training to use Telehealth

How many times have you been involved with the After Hours Telehealth service ?

How recently have you used the After Hours Telehealth service ?

- Today
 A few days ago
 A few weeks ago
 Several months ago
 More than one year ago

I have received education and training in all aspects of using the After Hours Telehealth System

- Yes
 No

I have a clear set of guidelines detailing the PROCESS I must follow for Telehealth consultations

- Strongly Disagree
 Disagree
 Neither disagree nor agree
 Agree
 Strongly Agree

I have a clear set of guidelines detailing the PAPERWORK required for a Telehealth consultation

- Strongly Disagree
 Disagree
 Neither Disagree nor Agree
 Agree
 Strongly Agree

The education and training I received completely prepared me for an after hours Telehealth Consultation

- Strongly Disagree
 Disagree
 Neither Disagree nor Agree
 Agree
 Strongly Agree
 I did not receive any education nor training

Do you require further education training in Telehealth ?

- Yes
 No

What further education and training would be useful ?

Communication

Communicating with the referral hospital to organise a Telehealth consultation is straightforward and simple

- Strongly Disagree
- Disagree
- Neither disagree nor agree
- Agree
- Strongly Agree

When thinking about the communication between YOURSELF and the referring nurses at the outlying health services, to what extent are YOU treated with dignity & respect? Please mark on the line

Not at all Completely

(Place a mark on the scale above)

Do you have any comments to make about the communication between the outlying hospitals and your role ?

Are you aware of any problems encountered by the doctors and nurses when using the Telehealth system ?

- Yes
- No

I am asked by the ED doctors or nurses to help set up the Telehealth equipment

- Always
- Sometimes
- Never

Please add any comments you may have about the quality of the connection, sound or vision of the Telehealth equipment

What effect does the After Hours Telehealth service have on your workload ?

My workload is unchanged My workload is greatly increased

(Place a mark on the scale above)

Accessibility of the system for patients

What is the average wait time from when you add the Telehealth referral to the ED work list until the patient is SEEN by the Telehealth doctor ?

Is there any difference between the wait times of Telehealth referral patients and actual waiting room patients at your ED ?

- Yes
- No
- I don't know

Are the patients in the waiting area at NHW aware that there are also virtual patients waiting in the Telehealth hospitals ?

- Yes
- No
- Unsure

Safety

Have you ever experienced any aggressive behaviour (verbal or physical) from patients or staff related to Telehealth ?

- Yes
- No

Please comment on any aggression you have experienced related to Telehealth ?

I feel stressed when dealing with patients using the After Hours Telehealth System

- Always
- Sometimes
- Never

Continuity of Care

The essential paperwork is sent to me from the outlying hospitals in a timely manner

- Always
- Mostly
- Never

I am able to return essential paperwork to the outlying hospital in a timely manner after the Telehealth consultation

- Always
- Mostly
- Never
- It is not my role to return any paperwork

Comments about paperwork ?

Is there a letter sent to the patient's usual GP after a Telehealth consultation?

- Always
- Sometimes
- Never
- Not sure

How confident do you feel about processing patients using the Telehealth service?

Not at all confident Completely Confident

=====

(Place a mark on the scale above)

Satisfaction

From my perspective the after hours Telehealth service is working well at my health service

- Strongly Disagree
- Disagree
- Neither disagree nor agree
- Agree
- Strongly Agree

Please use this space to tell us anything else you wish about your experiences of After Hours Telehealth

Interview Questions – Chief Executive Officers or Directors of Clinical Services/Nursing

1. What does telehealth mean for your health service in regards to workforce recruitment, retainment? Has it made a difference?
2. What does the telehealth service mean for the community? Has it made a difference?
3. What are the immediate and projected costs resulting from implementing the telehealth service?
4. Is the telehealth equipment used for any other purpose other than provision of after-hours care? For instance, has it enabled connectivity between GP practices and the hospital? Has it enabled connectivity to specialists in Melbourne?
5. Is this a service that can be expanded or continued?
6. Is there any other feedback you would like to provide on telehealth?

Survey Questionnaire – Patients

*By completing and returning this questionnaire you are helping us to evaluate the effectiveness of the Telehealth service and providing information about how we can improve it. The questionnaire will take about 15 mins to complete. **Please circle or tick your choice of answer or fill in the box where indicated.** Your answers are completely anonymous.*

Background Information about you

What is today's date?

1. What is your postcode?

2. What hospital did you attend for this Telehealth consultation?

3. What date did you attend the hospital for a Telehealth consultation?

4. Is this your local hospital?

⁰Yes

¹No

5. This Telehealth consultation was for:

¹ Me

² My child - Age of child?

³ My elderly relative /friend

⁴ Other – who?

6. What is your age?

7. Are you:

¹Male

²Female

8. How many times in your life have you come to *this* hospital for hours care?

9. Have many times have you used the Telehealth system?

10. Which of the following best describes your employment status?

- ¹. Working full time
- ². Working part time
- ³. Unemployed
- ⁴. Not in labour force

11. Please circle your Taxable income over the past 12 months?

- ¹. Less than \$18,200
- ². 18,201 – 37,000
- ³. \$37,001 - \$80,000
- ⁴. \$80,001 - \$180,000
- ⁵. \$180,001 and over

12. Were you born in Australia?

⁰Yes

¹No

13. Do you identify as a person of Aboriginal or Torres Strait Island heritage?

¹Yes

⁰No

14. What was the problem that caused you to come to the hospital today?

Preparing for Telehealth

15. Prior to coming to the hospital I had heard about the Telehealth system

1. Yes
2. No
3. Not sure

16. I was given a clear explanation of all aspects of the Telehealth assessment and treatment in terms I could fully understand?

1. Yes
2. No
3. Not sure

17. I was happy to have a Telehealth consultation

1. Strongly Agree
2. Agree
3. Neither agree nor disagree
4. Disagree
5. Strongly disagree

18. If the Telehealth system was not available I would have chosen to :

1. Travel by my own or my relative's car to another hospital
2. Call an ambulance
3. Wait at my local hospital until the local GP was available
4. Make an appointment to see the GP when he/she was next available
5. Go home and seek no further help
6. Other. Please describe:

Technology Related Questions

19. Connecting to the Telehealth consultation was straightforward and simple

1. Strongly Agree
2. Agree
3. Neither agree nor disagree
4. Disagree
5. Strongly disagree

20. When the Telehealth system was set up and connected, I could see the doctor clearly

1. Strongly Agree
2. Agree
3. Neither agree nor disagree
4. Disagree
5. Strongly disagree

21. When the Telehealth system was set up and connected, the doctor could see me clearly

1. Strongly Agree
2. Agree
3. Neither agree nor disagree
4. Disagree
5. Strongly disagree

22. When the Telehealth system was set up and connected I could hear the doctor easily

1. Strongly Agree
2. Agree
3. Neither agree nor disagree
4. Disagree
5. Strongly disagree

23. When the Telehealth system was set up and connected the doctor could hear me easily

1. Strongly Agree
2. Agree
3. Neither agree nor disagree
4. Disagree
5. Strongly Disagree

24. Was the doctor able zoom in on an affected part of your body and get a clear picture?

1. Yes
2. No
3. Not applicable

Please comment on the internet connection, the sound or the vision or any other aspects of the consultation you wish to discuss

Accessibility Questions

25. How long did you have to wait from when you arrived at the hospital until you had the Telehealth consultation?

26. In *your experience* was the wait time for the Telehealth consultation:

¹ Longer Or ² Shorter

than seeing a doctor face to face in the emergency department ?

27. Were you given an accurate estimation of the wait time until when the Telehealth video link would take place?

¹ Yes ² No

28. Were you given an accurate explanation about what would happen in the Telehealth consultation?

¹ Yes ² No

29. How much money did you spend out of pocket to use the telehealth service?

30. If the Telehealth service was not available and you had to seek health care elsewhere, would that cost you:

- ^{1.} More money
- ^{2.} Less Money
- ^{3.} Unsure

Responsiveness and quality of care

31. How confident did you feel about the doctor examining you (or the person you care for) using Telehealth?

Please mark on the line

0-----10

No confidence at all

Complete confidence

32. How confident did you feel about the decisions the doctor made when using Telehealth?

Please mark on the line

0-----10

No confidence at all

Complete confidence

33. To what extent were you (or the person you care for) treated with dignity and respect in the Telehealth consultation?

Please mark on the line

0-----10

No dignity or respect at all

Complete dignity & respect

34. To what extent did the Telehealth consultation protect the privacy and confidentiality of you (or the person you care for)?

Please mark on the line

0-----10

No privacy or confidentiality

Complete privacy & confidentiality

35. To what extent did the Telehealth consultation help you to make decisions and choices about care?

Please mark on the line

0-----10

Unable to make choices

Completely able to make choices

36. Did anything occur during the telehealth consultation that you did not expect?

1. Yes (if yes please explain)

2. No

37. Did you feel comfortable about being in front of the video camera?

1. Yes 2. No

38. Did you feel comfortable about speaking on video?

1. Yes 2. No

39. Were you worried other people might hear or see you on video?

1. Yes 2. No

40. Do you believe the doctor could accurately assess your condition using telehealth?

1. Yes 2. No 3. Not sure

41. How did telehealth compare to a face to face consultation with an emergency doctor?

1. Much better
2. Better
3. The same
4. Worse
5. Much worse
6. I don't know

42. The treatment I (*or the person I care for*) received during the telehealth consultation resolved the symptoms or condition I came to hospital for:

1. Strongly Agree
2. Agree
3. Neither agree nor disagree
4. Disagree
5. Strongly disagree

43. Having a medical consultation using Telehealth was

1. Very effective
2. Effective
3. Ineffective
4. Highly ineffective

44. How satisfied were you overall with the Telehealth service?

1. Very satisfied
2. Satisfied
3. Neither satisfied nor dissatisfied
4. Dissatisfied
5. Very dissatisfied

Survey Questionnaire – Patients

45. Would you use the service again?

1. Yes
2. No
3. Maybe

46. Would you recommend the service to others?

1. Yes
2. No
3. Maybe

47. Are many people in your community aware of the after hour's emergency telehealth service?

1. Yes
2. No
3. Don't know

48. Did you receive a prescription for medication at this Telehealth consultation ?

1. Yes
2. No

Continuity of Care Questions

49. Do you plan to have a follow up visit with your usual GP post this Telehealth consultation?

1. Yes
2. No
3. Maybe
4. I don't have a usual GP

*If yes, **when** and **why** will you see your GP?*

50. Having the Telehealth Service at my local hospital for after hours medical care makes me :

1. More comfortable to come straight to my local hospital when I need help
2. Prefer to wait until the GP is back on duty
3. Travel directly to the larger regional hospital
4. Call an ambulance instead of going to my local hospital
5. Not seek medical care at all
6. Hasn't changed how I make decisions about seeking medical help
7. I don't know

51. In your opinion what could improve the Telehealth service?

Please use the space below for any other information you would like to share about your experience of the Telehealth system.

Appendix L: Evaluation Results from Interim Report

The Hume ED telehealth service is evaluated within the framework of three themes based on the Australian Institute of Health and Welfare (AIHW) health performance indicators (2009). The themes are defined as:

- **Accessibility:** People can obtain healthcare at the right place, at the right time irrespective of incomes, physical location and cultural backgrounds.
- **Continuity of care:** Ability to provide uninterrupted coordinated care or service across programs, practitioners, organisations and levels over time.
- **Responsiveness:** Healthcare service is patient oriented. The client is treated with dignity, respect and confidentiality and encouraged to participate in choices related to their care.

The evaluation framework considers the perspectives of five groups accessing or implementing the service, namely the patients and carers, nursing staff at the referral sites, medical officers at the consulting Emergency Department, clerical officers and general practitioners servicing the referral sites. The number of respondents participating in the evaluation and the instruments used to gather data are detailed in Table X. Telehealth Evaluation Outcomes.

Patient feedback via written questionnaires has been minimal to date, however the responses are positive and align with the perceptions of patient experience by nursing staff assisting patients undergoing a telehealth consultation. Patient accessibility is enhanced by the service, although awareness of the service needs to be increased, with the exception of instances where ED is particularly busy and patients wait longer than they expect in comparison to having a medical officer on call or on site. There is no indication that patients feel the service decreases responsiveness, with no stated implications for dignity, privacy or patient choice.

Nursing staff report some teething difficulties with documentation and lines dropping out however processes have since been improved. They report that time taken to scan and email information to ED erodes the time spent with the patients and on other duties and ascertaining wait times for patients can be a problem if ED does not keep them informed. Vision and sound with the equipment is good and patients respond well to communicating via the screen with the medical officer. Overall nursing staff are positive about the telehealth option for patients, and are comfortable with the process and guidelines once they have had adequate experience. They enjoy the autonomy and not having to send patients to NHW or Wodonga ED from remote locations that may involve difficult travel and expense for patients. Building trust relationships between clinical staff at the referring site and the consulting site is an important factor for success and also a positive outcome of the program

General practitioners are one step removed from the telehealth service so their perspective is largely about perceived benefits and disadvantages for the operation of individual practices and their respective UCCs. Some UCCs refer directly to NHW ED whereas others have a facility where the GP can telehealth to the UCC using the iPad supplied – this is not yet being routinely used. For continuity considerations, telehealth is predominantly about the ability to provide out of hours services and where demand is heavy, telehealth is considered vitally important in retention and GP workload balance. Those practices where rostering for out of hours is light prefer not to use telehealth and have concerns about the impact on the sustainability of their out of hours service. There was no stated perception of loss of dignity and respect for patients, privacy and confidentiality or patient choices issues in using telehealth services.

Medical officers did not report major accessibility problems for patients using the telehealth system. They were challenged by the inability to physically examine the patient yet satisfied with the standard of care they were able to provide in conjunction with staff at the referring site and

considered the responsiveness of the service to be satisfactory. They reported the need for some process improvements with the documentation. Clerical staff reported that there were continuity of care issues particularly when ED was busy but that familiarity with the service and the procedures would overcome these issues in the longer term.

In conclusion, telehealth can be said to have improved accessibility where implemented and all groups felt telehealth would improve accessibility once implemented in other areas. Continuity of care issues can be addressed by continual refinement of processes, the widening of experience with the telehealth service and the building of relationships between all groups involved. The ability of telehealth to deliver a responsive, patient oriented service is feasible given the positive attributes evident in this evaluation.

(Prepared by Rowan O'Hagan - 26.6.2014)

Respondent Category	Patients	Registered Nurses	Medical Officers	General Practitioners	Clerical Staff
Number of Respondents: 45	3	14	7	6	15
Format	Questionnaire	Focus groups (2)	Questionnaire	Telephone interview	Questionnaire/focus group
Accessibility					
Positives	<ul style="list-style-type: none"> Attend local UCC No cost No extended travel Advice available when needed Knowledge of service (post access) is attraction to region 	<ul style="list-style-type: none"> All patients accepted offer of service Reduces isolation and builds skills for nurses Reduces need for patients' travel and expense 	<ul style="list-style-type: none"> No age or cultural barriers identified (from limited number of patients) however reluctance to treat babies and elderly Half of patients had carer with them 	<ul style="list-style-type: none"> Positive outcomes for patients in practices where need is perceived GP attraction and retention in practices with high out of hours demand 	<ul style="list-style-type: none"> Perception of positive outcomes for patients
Negatives	<ul style="list-style-type: none"> Waiting times for medical officer attention (but happy to wait) Low awareness of service Uncertainty about what is involved 	<ul style="list-style-type: none"> Uncertainty about treatment of Cat 3 patients Large variation in waiting time for patients (often longer than they expect) 	<ul style="list-style-type: none"> Ability to physically examine patient is lost Cannot observe medication or treatment outcomes Taking patient history with time delay 	<ul style="list-style-type: none"> Threat to sustainability of some current out of hours rosters if call outs decrease Roll out of training difficult in small UCCs 	<ul style="list-style-type: none"> More difficult when ED is busy Not all aware of guidelines Familiarity will build confidence and speed with the process
Continuity					
Positives	<ul style="list-style-type: none"> Follow up with GP possible and in some cases expedited Vision and sound during consultation is good 	<ul style="list-style-type: none"> Documentation procedures overall timely Patients have access to follow up with usual GP the next day Provides backup /further advice and reassurance 	<ul style="list-style-type: none"> Experience with telehealth builds confidence Technology appropriate and functional Follow up with GP encouraged 	<ul style="list-style-type: none"> Reduction in number of call outs Ability to retain GPs and avoid burnout important in practices where out of hours demand is high 	<ul style="list-style-type: none"> Understood referral/registration process, less confident with scanning/email process

Negatives		<ul style="list-style-type: none"> • Staff at Wangaratta generally helpful • Ability to build ongoing trust relationships • More options and autonomy for nurses • Flowchart easy to follow 	<ul style="list-style-type: none"> • Level of confidence in staff and support from referring site • Clinical information communicated clearly and in timely manner • Prescribing decisions similar to face to face consultation 	<ul style="list-style-type: none"> • GP able to see more patients during day following on call roster when demand reduced by telehealth • Beneficial in emergency/crisis situations to access additional expertise 	<ul style="list-style-type: none"> • Most felt guidelines were appropriate (some suggested improvements) • Positive relationships built with other sites
	<ul style="list-style-type: none"> • None identified 	<ul style="list-style-type: none"> • Time spent scanning and emailing documents • Constructive relationships with staff take time to build 	<ul style="list-style-type: none"> • Follow up letter not always sent • Medical officer training and access to guidelines about telehealth was inconsistent 	<ul style="list-style-type: none"> • Changes to accepted rosters and services in some practices • Lack of familiarity of GP with technology 	<ul style="list-style-type: none"> • Ensuring timely process when ED is busy
Responsiveness	<ul style="list-style-type: none"> • Nothing to indicate that patients' dignity, choice or confidentiality was impaired • Able to see and hear doctor clearly 	<ul style="list-style-type: none"> • Patients felt 'privileged' to use service • No negative feedback on service 	<ul style="list-style-type: none"> • Patient dignity, respect, privacy and confidentiality not compromised • Patients had choices and satisfaction was generally high 	<ul style="list-style-type: none"> • Positive patient feedback received where service has been used 	<ul style="list-style-type: none"> • Integrated with regular work practices so similarly patient oriented
Negatives	<ul style="list-style-type: none"> • None Identified from limited responses 	<ul style="list-style-type: none"> • Time away from patient spent scanning and emailing documents • Managing patients' expectations of medical attention and timeliness in their local UCC 	<ul style="list-style-type: none"> • Less ability to interact with patient 	<ul style="list-style-type: none"> • GP perception that patient unable to choose local practice for out of hours care 	<ul style="list-style-type: none"> • None Identified

Appendix M: Memorandum of Understanding

MEMORANDUM OF UNDERSTANDING

BETWEEN

NORTHEAST HEALTH WANGARATTA

AND

Small Rural HEALTH

IN RESPECT OF THE

Emergency Medicine Telehealth Service

March 2015

MEMORANDUM OF UNDERSTANDING

THIS MEMORANDUM OF UNDERSTANDING is made on the 3rd day of March 2015.

BETWEEN

NORTHEAST HEALTH WANGARATTA
of Green Street, Wangaratta, Vic 3677, a body
incorporated under the *Health Services Act 1988*.

AND

Small Rural HEALTH
of 45 Wangaratta St, Hume, Victoria 3007 a body
incorporated under the *Health Services Act 1988*.

BACKGROUND

- (a) Small Rural Health (SRH) is a Small Rural Health Service which operates an Urgent Care Centre (UCC) after hours utilising on-call local General Practitioners (GPs)
- (b) Northeast Health Wangaratta (NHW) is a Sub-Regional Health Service with a 24 hr Emergency Department and is currently supplying telehealth through the Emergency Department for rural facilities in the Hume Region.
- (c) NHW has agreed to undertake a fixed period trial video-conferencing-based clinical support (telehealth) service to SRH in order to support nursing staff to manage presentations to the SRH Urgent Care Centre for periods of nominated time, when a GP is not available.
- (d) It is not the intention to create a situation where telehealth is the default model of care. Currently most presentations to SRH UCC are triaged and managed by a SRH Registered Nurse (SRH RN) who then refers the patient to a GP for follow up or refers directly to Northeast Health Wangaratta or to ARV. Telehealth is not intended to de-skill SRH RNs but to provide support to what they do in circumstances where SRH GPs cannot support SRH and its population. SRH RNs' scope of practice will be clearly defined to ensure clarity of roles in this process.

IT IS HEREBY AGREED BETWEEN THE PARTIES:

1. TERM

- 1.1 The term of this Memorandum of Understanding (MOU) shall be for 12 months. This has been agreed between Northeast Health Wangaratta and Small Rural Health on the basis that each health service provide their own funding to deliver the service. Ongoing service provision, beyond this period will be dependent on further funds being available.

2. REVIEW OF MEMORANDUM OF UNDERSTANDING

- 2.1 No review of the terms of this Memorandum of Understanding is required during the project period, however at any time, parties to this agreement may request that proposed changes to the Memorandum of Understanding be considered. Amendments to the Memorandum of Understanding will only be effective if made with the written agreement of both parties and signed by the designated signatories to this Agreement (or equivalent positions) or their delegates. This includes any changes to documentation (ISBAR telehealth referral & MR 8-02B telehealth consultation record) and work flow processes (see Appendix 1).

3. NEW SERVICES TO BE DELIVERED

- 3.1 NHW will provide SRH with telehealth support to SRH'S registered nursing staff (SRH RN) managing patients. These inclusion criteria are:

- The patient has presented to SRH UCC between the hours of 2100hrs and 0700hrs and is assessed by the SRH RN to have a presenting problem consistent with Australasian Emergency Triage Scale (Triage) categories 4 or 5.
- The patient has vital signs/clinical observations outside an expected range and/or the SRH RN has concerns regarding the management of the patient and wishes to initiate a telehealth consultation.
- Patients presenting to the SRH UCC with urgent conditions that obviously require management in a 24 hour staffed Emergency Department, will be transferred to NHW in accordance with SRH practice.

- 3.2 SRH GPs will continue to provide services at the nominated dates and times as per the VMO GP on call roster.

- 3.3 NHW will provide telehealth support to SRH RNs in accordance with the referral protocol agreed between NHW and SRH which is attached to this document as Appendix 1.

- 3.4 The form that the support will take will be:

- (a) Assessment of the patient by the NHW MO via discussion between the NHW MO and the SRH RN; review of relevant vitals signs data and investigation results; visual assessment of the patient via videoconferencing link between SRH UCC and NHW ED; and discussion between the NHW MO and the patient and/or family or carer, as appropriate.
- (b) Advice given to the SRH RN by a medical officer employed by NHW (NHW MO). This advice will be to guide the clinical management of the patient and will be in accordance with NHW extant policies and protocols. The advice provided cannot require a SRH RN to practice outside of SRH extant policies and protocols. Advice may also be provided directly to eligible patients and/or their relatives/carers at SRH.

- (c) Where appropriate the provision of a 'telephone order' of medications to be administered by the SRH RN to the patient. Note there is no legal provision for the SRH RN to dispense 'take home' doses of medication.
- 3.6 Established protocols will guide treatment and if indicated transfer to NHW will be effected. The Primary Clinical Care Manual, 7th Edition 2011 will guide treatment provided by SRH nursing staff.
- 3.7 Whilst every attempt will be made by the NHW MO to provide a telehealth service in a timely fashion, SRH acknowledges that the NHW MO is also expected to manage a caseload within the Emergency Department at NHW and will prioritise patients according to his or her best assessment of clinical urgency.
- 3.8 A flowchart illustrating the referral process is attached as Appendix 1.

4. FUNDING AND RESOURCES

- 4.1 Each party agree to meet own costs associated with the provision of this service for the period of the Memorandum of Understanding.

5. CLINICAL GOVERNANCE

- 5.1 NHW will be responsible for
 - (a) Employing medical officers who hold general registration with the Medical Board of Australia and rostering those medical officers in the NHW Emergency Department so that one is available to provide telehealth services during the nominated times, on the nominated dates within the provisions of clause 3.7 above. In the event of unavoidable circumstances such as the sudden illness of a rostered MO NHW will advise SRH of the temporary suspension of the telehealth service and the likely duration of the suspension. NHW will use its best endeavours to avoid and/or minimise the duration of any such disruption to service delivery.
 - (b) Providing SRH with any information reasonably necessary to enable SRH to credential, if required, the NHW MOs providing the service
 - (c) Indemnifying its MO through NHW's arrangements with the Victorian Managed Insurance Agency (VMIA)
 - (d) Installing and maintaining suitable IT equipment and systems at NHW to facilitate telehealth services

- (e) Ensuring all relevant staff are briefed and educated in the use of telehealth equipment and process including communication utilising the ISBAR format, and appropriate record-keeping
- (f) Maintaining adequate medical records of its employees' assessment and advice to telehealth patients/relatives/carers and to SRH RNs in relation to telehealth patients

5.2 SRH will be responsible for

- (a) Employing registered nurses who hold general registration with the Nurses' Board of Australia and rostering those registered nurses in the SRH UCC so that one is available to provide care to eligible patients
- (b) Making any necessary arrangements for the credentialing of the NHW MOs who will provide the service
- (c) Indemnifying its RN through SRH's arrangements with the Victorian Managed Insurance Agency (VMIA)
- (d) Installing and maintaining suitable IT equipment and systems at SRH to facilitate telehealth services
- (e) Ensuring all relevant staff are briefed and educated in the use of telehealth equipment and process including communication utilising the ISBAR format, and appropriate record-keeping
- (f) Maintaining adequate medical records of its employees' assessment and management of telehealth patients
- (g) Briefing relevant patients and/or guardians on the use of telehealth services and obtaining consent for a telehealth consultation to be initiated.
- (h) Responding to requests for information about the management of telehealth patients made under Freedom of Information legislation, and responding to subpoenas/requests from police or statutory bodies.

5.3 NHW and SRH jointly will perform periodical audits of eligible patients and their management in order to refine process and ensure high quality care is delivered. Audit data to be collected is listed in Appendix 2.

6. EVALUATION AND REPORTING

6.1 Evaluation of the program will occur periodically by a steering committee comprising members of both NHW and SRH executives. Reports from the evaluation will be provided to each organisation's Clinical Review Committee or similar and an agreed briefing provided to the DoH.

7. TERMINATION

7.1 This Memorandum of Understanding may be terminated by either party giving the other party four weeks written notice.

8. DISPUTE RESOLUTION

8.1 If any question, difference or dispute arises between the parties, dispute resolution in the first instance is the responsibility of the steering committee.

8.2 Where agreement cannot be reached by the steering committee, the CEO of NHW and the CEO of SRH will agree on the method of resolution to apply to the particular question, difference or dispute.

9. INTELLECTUAL PROPERTY

9.1 In respect of any methods, plans or guidelines created by one of the parties, that party shall retain the intellectual property in the product, notwithstanding that the steering committee may have approved the method, plan or guideline.

9.2 In respect of any methods, plans or guidelines created jointly by the parties or by the steering committee, both parties shall be entitled to the intellectual property in the product.

DATED: _____

Signed for and on behalf of **NORTHEAST HEALTH WANGARATTA**

Margaret Bennett
Chief Executive Officer

IN THE PRESENCE OF:

Name of Witness:

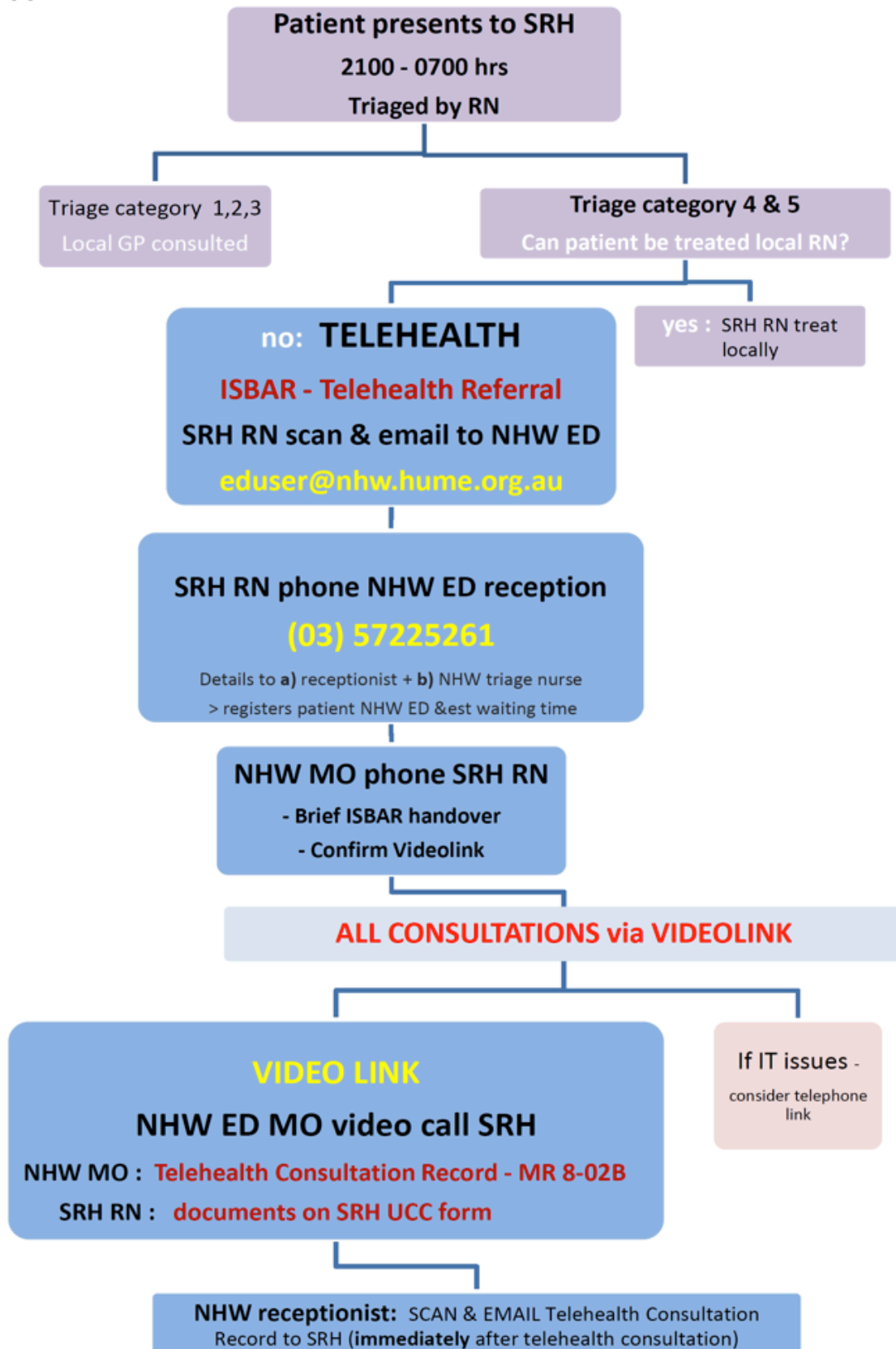
Signed for and on behalf of **Small Rural HEALTH**

Charlie Brown
Chief Executive Officer

IN THE PRESENCE OF:

Name of Witness:

Appendix 1.



Appendix 2

Data to be collected for audit

Focus on timelines, patient outcomes, patient and staff satisfaction

SRH:	
• Patient satisfaction	(UoM patient survey)
• Did patient represent to another facility? Why?	(UoM evaluation)
• Readmission/representation rate	(audit of patient file)
• Patient outcome	(audit of patient files)
• RN satisfaction	(UoM electronic survey)
• Record ALL presentations to UCC	(feedback & analysis both sites)

NHW:	
• Time patient arrived in SRH	(telehealth referral)
• Time telehealth referral arrives	(NHW ED telehealth consult record)
• Time telehealth link occurs	(NHW ED telehealth consult record)
• Time telehealth concludes	(NHW ED telehealth consult record)
• Time takes to complete telehealth paper work	(NHW ED telehealth consult record)
• NHW MO & RN satisfaction	(NHW ED telehealth consult record - 1-5 rating suggestions on how to improve included)
• Number of telehealth presentations monthly	
• Number referrals for triage categories - +/- service creep	
• Waiting times at NHW ED – impact of telehealth referrals	
• Waiting times NHW ED prior to telehealth	
• Record ALL presentations to NHW ED	(feedback & analysis)





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Author/s:

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Title:

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