Telehealth consultations in rural hospital emergency departments: Supporting best practice for junior doctors

Final Report

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Introduction & Context

This work is one part of a larger project implementing a telehealth after hours support service from the emergency department (ED) of the regional hospital, Northeast Health Wangaratta, to multiple GP led referral hospitals with urgent care centres. The overall aim of the larger project is to alleviate the demands on rural GPs in providing after hours care in the small rural community hospitals and secondly to provide an alternative to driving long distances for after hours medical assistance at the regional centre for the residents of those same communities. The workforce providing the telehealth support consists of a mixture of junior and senior doctors. The referral hospitals using Telehealth are staffed by registered nurses with no available medical personnel. The definition of telehealth in the context of this work refers to the consultations between clinicians and patients, using real-time video conferencing.

This PMCV project focused on exploring the junior doctor experience of conducting the after-hours telehealth consultations from the regional hospital emergency department. At the time of the study the overarching Telehealth project was very new. The hypothesis was that junior doctors rotating into the regional hospital would not have had prior experience using Telehealth for delivering emergency care and would encounter challenges in assessment and management.

Informed by the findings from the work exploring the junior doctor experiences, the next step was to develop an educational Telehealth resource for the junior doctors to undertake prior to their rotation into the Northeast Health emergency department.

Background

The use of telehealth has been described as having the potential to reduce the inequitable access to health services and the poorer health status that many rural people experience, and contribute to addressing the ongoing problem of burnout of the rural health workforce most especially isolated GPs (Meyers, Gibbs et al. 2012). Telehealth has been seen as enabling improved quality, integration and implementation of evidence based care, and to be a major support for the Australian rural health workforce, notwithstanding there are some potential organisational, technical, ethical, medico-legal and governance problems (Wade, Eliott et al. 2012). Many studies have shown no differences in outcomes between telehealth care and usual care (McLean, Sheikh et al. 2013), however to date there has been a failure in the literature to adequately describe the Telehealth intervention. This lack of detail makes it difficult to disentangle the contributions of technological and human/organisational factors on the outcomes reported (McLean, Sheikh et al. 2013).

A recent systematic review of telehealth evaluations was undertaken by The University of Melbourne, Institute of Broadband Enabled Society (Dattakumar, Gray et al. 2013) with the aim of creating a conceptual framework that incorporates the key dimensions, criteria and measures that need to be considered in the evaluation of telehealth implementations in Australia. This review highlighted that while there is a significant amount of telehealth evaluation literature across various specialties in health care, it is difficult to identify the outcomes of use and to compare these outcomes between projects. What is clear from the literature is that patients are rarely at the forefront of evaluations nor are the experiences and training needs of staff new to telehealth nor the nature of the inter-professional relationships involved in Telehealth (Darkins, Foster et al. 2013). Descriptions of the training and clinical practice skills needs are also missing in the literature. Specialised training resources for doctors and medical students in consent, history taking, decision making and examination using telehealth are not readily available (Verhoeven, Tanja-Dijkstra et al. 2010).

The Australian College of Rural and Remote Medicine (ACRRM) has responded to this by developing a Standards Framework (Australian College of Rural and Remote Medicine 2014) to provide health and medical colleges, clinicians and health care organisations with a common approach to the development of craft specific guidelines to assist members in the establishment of quality telehealth services. This framework suggests that in establishing a telehealth service consideration should be given in regard to criteria for the skills the health care provider should have to use telehealth (1.5.1 Skills of Practitioners). Ensuring medical staff have the skills and knowledge to undertake effective consultations using telehealth is an important first step in ensuring the patient experience is a safe, effective and satisfying one. It is also an important consideration in the job satisfaction of doctors and nurses in rural and regional health settings.

Rationale for the study

Junior doctors rotating into the emergency department are well prepared for face to face assessment, diagnosis and treatment but have no undergraduate training and minimal exposure to the use of real time video consultation for assessment and management of offsite urgent care patients. The ACRRM telehealth framework suggests that when establishing a new telehealth service consideration should be given to the skills of the health care provider specific to the constraints and opportunities of the technology.

Objectives of study

1. To understand the experiences of junior doctors in consulting with the after hours care of patients from remote sites using telehealth.
2. To identify any skills deficits in assessment and management when undertaking a consultation with a patient from a remote site using Telehealth.
3. To design a brief educational intervention for junior doctors targeting the key competencies in effective Telehealth consultations when working in a Regional Emergency Department.

Organizational setting

This study took place at Northeast Health Wangaratta (NHW) which is the principal referral hospital for the central Hume region, servicing a catchment of around 100,000 people. The health service provides 24 hour emergency department care and has a diverse clinical capacity with 27 medical beds, 25 surgical beds, 12 paediatric beds, 8 critical care beds. 6 obstetric beds, 6 special care nursery, 31 rehab/sub acute beds, 7 dialysis chairs, 8 oncology chairs, 10 day stay beds, 62 residential aged care beds and a large range of community health services including dental. The health service employs in excess of 1200 people.

The ED Telehealth program currently supports 11 urgent care centres in outlying health services of the central Hume region in the after hours periods when no local doctors re available. Category four and five patients who present to the urgent care centres in the after hours periods are assessed by the referral centre nurses and if deemed suitable for Telehealth are then referred to the Northeast Health ED Telehealth service. The nurses' phone NHW to flag a telehealth patient, send though a set of clinical documentation and the patient is then added to the NHW patient list for assessment joining a virtual queue analogous to being in the waiting room.

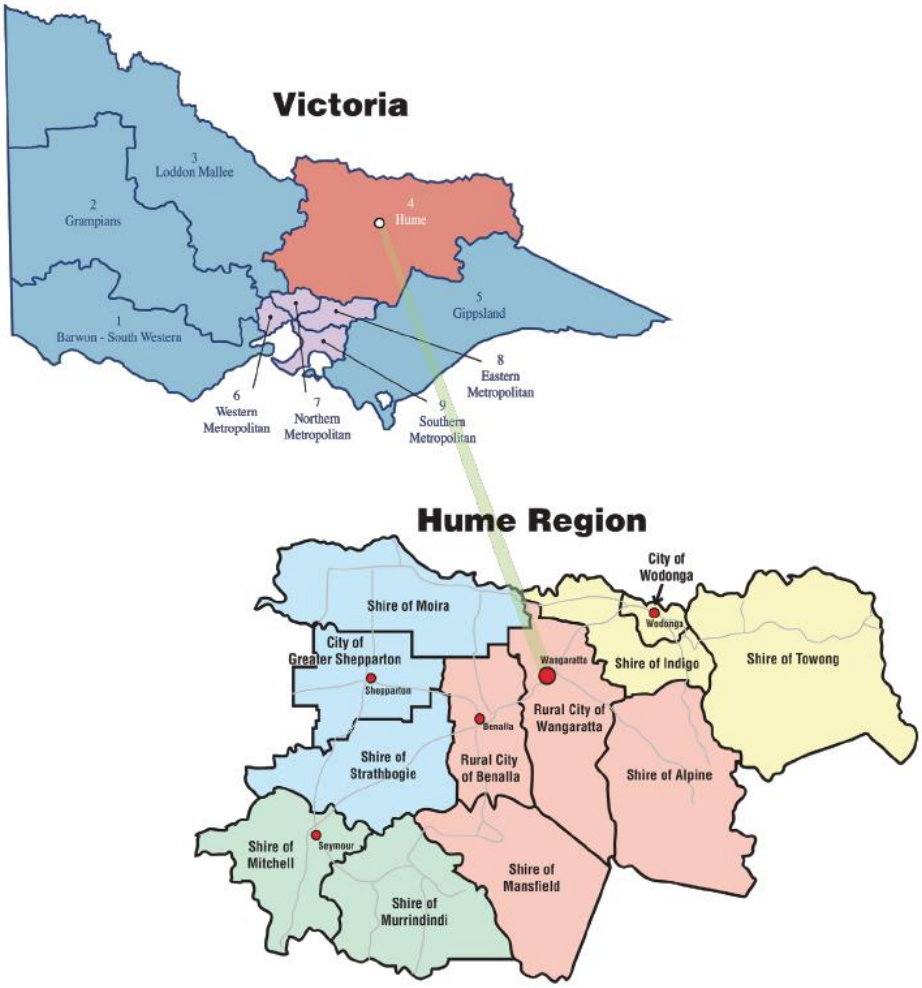

Figure1. Northeast Health Wangaratta location

Methods

Recruitment

Fifteen junior medical officers who were currently working or had recently been working in the emergency department at Northeast Health Wangaratta were invited to participate in the study during the months of May, June and July 2014. The doctors' contact details were supplied by the office of the Director of Medical Services. All doctors were contacted by telephone or email and invited to participate in the study. Each doctor received a plain language statement explaining the study via email. The junior doctors were offered the opportunity to participate in either of three ways:

1. Join a focus group discussion
2. Complete a self-report questionnaire
3. Have a structured interview (based on the questionnaire)

Returning the completed questionnaire was considered as giving consent to participate. Verbal consent was sought prior to participation in interview or focus group.

The questionnaire

Self-report questionnaires were designed specifically for the study.

Thirty eight questions were constructed with the aim of understanding the perceptions of the junior medical officers in regard to:

- The existence and use of guidelines, pre-training, support from senior doctors.
- Level of confidence in assessing patients and making clinical decisions (including prescribing)
- Level of confidence and communication with referral hospital staff
- Issues related to use of technology
- Issues related to patient accessibility
- Issues related to confidentiality and continuity of care
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Data analysis

Basic demographic data were collected to describe the background characteristics of the participants. Confidence levels were measured using visual analogues scales. Thematic analysis of short answer free text questions was undertaken to understand the key aspects of the junior doctor experience in using telehealth in the ED.

Ethics

Permission to conduct this work was sought and approved form Northeast Health HREC.

Results

Participation

Eight doctors agreed to participate in the study (53 %). Of these five completed self-report questionnaires and three were interviewed with the questionnaire providing the structure for the interview.

Background Information on the Medical Officers

Table one shows the background information on the participating junior doctors indicating that their level of medical experience ranged from one week to six months.

Table 1. *Participant Demographics*

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

Use of guidelines

Clinicians were asked whether there were a set of guidelines for telehealth consultations available in the ED for them to follow. As seen in Table 3, there were mixed perceptions amongst the clinicians as to the existence of guidelines for either setting up and/or undertaking a telehealth consultation. Based on the open ended comments, the doctors considered short, precise guidelines as important.

Table 2: *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.

Training and Support for telehealth consultation

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.

Of the eight doctors only two received any training in both setting up the telehealth equipment and in how to undertake a consultation using telehealth. One additional doctor received training in how to set up the equipment but not in how to undertake the consultation. No-one reported having any support from a senior doctor when using telehealth however one respondent commented that this is because it is junior doctors who staff the ED overnight when most telehealth occurs- see Table 3.

Table 3.*Training and support in using Telehealth*

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.		No

Confidence in using telehealth

Participants were firstly asked to rate their confidence level before and after their initial telehealth consultation on a visual analogue scale with 0 equalling no confidence at all and 10 equalling complete confidence. The ratings are provided in Table 4. Four participants stated that after undertaking one telehealth consultation their confidence level increased, one stated that her confidence level decreased, while three others stated that their confidence levels did not change. Comments revealed that confidence was related to the suitability of the type of condition being treated via telehealth.

Table 4: *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."

Following this they were questioned further about what impacted on their level of confidence and two key factors emerged.

1. *Difficulty with physical examination and assessment*

When asked to comment further about their confidence the most common subject that arose was the capacity to make an assessment of the patient through a remote 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]

"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]

Other participants expressed concern over the more subtle aspects of physical appraisal based on the patient's walk, dressing style and the way they act.

"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]

2. *Competence of the healthcare professionals*

The competence of the healthcare professionals at the referring site was viewed as a key determinant for a successful consultation. This aspect was picked up several times in the questionnaire with both positive and less than positive experiences reported in regard to communicating effectively with the referral sites.

"…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."

"Quality of nursing care at other end." [P4]

"The severity of patient's presentation, the capabilities of the referring health service." [P5]

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

"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]

Technology capability

Participants were asked about the ease of connecting for a telehealth consultation, and when connected, the clarity of vision and sound. Two participants chose to provide open ended responses. As seen in Table 5, the capability and capacity of the technology is considered quite good by the participants. Connecting to the internet was quite simple, and the audio and video quality was mostly very good or good, however some participants identified some issues with sound delay, bright lighting and the need for multiple observation screens.

Table 5: *Technology*

Participant ID	Connecting to Telehealth 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
	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.

Accessibility

Participants were asked whether a patient's cultural background or age had any influence on the doctor's capacity to successfully undertake a telehealth consultation.

With the exception of one participant [P8] who has treated Aboriginal patients in Western Australia (made no difference using telehealth), no other participant has had the opportunity to treat people from diverse cultural backgrounds using telehealth. 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, six participants said that this factor did not influence their capacity to treat patients. Two participants however, said that it does influence 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

The capacity for the junior doctor to provide uninterrupted, coordinated care using telehealth was examined under three domains. Overall there appeared to be reasonable capacity to provide good continuity but there were some inconsistencies which were related to a lack of information, absence of clear guidelines and the type of clinical presentation:

1. *Information flow back and forth in a timely manner from and to the referral hospital*

Participants were asked whether they received clinical documentation about the patient, in a timely manner from the referral hospital. While most respondents felt that this aspect was satisfactory it appeared that there was some work to do in ensuring that the documentation systems were streamlined and consistent:

> "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]

In terms of the flow of information *back* to the referral again the majority of respondents felt this worked well however one person who disagreed [P8] felt comprised by a lack of documentation and clinical information.

> "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."

2. *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. In general the participants agreed that there was no difference in prescribing patterns, however one participant who disagreed [P8] provided some insight into the type of prescribing suitable to an ED telehealth presentation :

> "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 fluid 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]

3. *Follow up with the General Practitioner*

Out of a total of eight responses, seven participants stated that they always advise their patient to seek further advice and treatment from their GP. One participant [P2] stated that this occurs "sometimes". Letters sent to the respective GP after the telehealth consultation was however very inconsistent with four participants stating that they have never done this, two participants had done this sometimes, and two participants always sent a letter to the GP.:

> "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]

Participants were asked to rate on ten point scales (with higher scores equalling better outcomes) 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 thought the patients were able to make their own decisions and choices about the care they received. Overall the ratings were consistently high with comments indicating that the doctors felt there was little difference between telehealth and face to face care in regard to these domains. These ratings are provided in Table 6.

Table 6: Responsiveness of care

Dignity and Respect	Privacy and Confidentiality	Decisions and choices about care
9	9	9
10	7	5
7	8	8
10	10	10
10	9	7
6	8	9
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.
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.

Stress related to using telehealth

Participants were asked whether they felt stressed when using the telehealth system to treat patients. Six participants were not stressed by the telehealth consultations but two participants' said that they were stressed. One participant, who agreed that she is stressed when using telehealth made the following comment:

"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]

Overall impression of their experience with Telehealth

Further comments or thoughts about telehealth in general were sought and while the impressions were generally positive the issue of the skill of the referring practitioner, the need for training in Telehealth consultations and understanding the limitations were the recurrent themes.

"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]

"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 telehealthing (sic) 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]

Development of Training package

Informed by the findings of the junior doctor interviews and survey responses a short on-line training module with quiz has been developed to assist junior doctors in undertaking ED Telehealth consultations. This will be added to two other new resources developed by the project team. The suite of materials developed and accessible to junior doctors will include:

1. Short on-line training module with quiz
2. ED Telehealth handbook with guidelines for set up, documentation and successful consultation tips
3. Instructional ED telehealth video with section targeting physical examination and correct patient selection

Once approved by the hospital executive in early 2015 all resources will be loaded on to a customised Telehealth tab on the Northeast Health homepage for easy access and will be included in the orientation package for new doctors.

Conclusion and Recommendations

This project highlights that junior doctors working in a regional emergency department are novices in undertaking patient assessment and management using Telehealth and require support and direction. Junior doctors are positive regarding the valuable contribution telehealth can make to rural health. Nevertheless they have reported some gaps in their preparation to offer this service and concerns regarding their capacity to undertake adequate assessment of their patients and receive the information they need from the nurses at the referring hospitals.

Clear guidelines and training particularly in the area of physical examination and correct patient selection are important in ensuring high quality consultations. Training materials have now been developed to assist with this issue. Teaching and practical experience in Telehealth would be a worthwhile inclusion in undergraduate medical education particularly for medical students undertaking rural health placements.

Further research is needed to understand the issues facing the nurses in the referring hospitals using the after hours telehealth service and developing training packages to assist them in appropriate patient selection for telehealth and physical examination skills tailored to the telehealth encounter. The relationship between the nurses in the referral hospitals and the junior doctors are crucial to the success of telehealth in this context.

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