

How to Make Telehealth Work:

DEFINING TELEHEALTH PROCESSES & PROCEDURES

Victoria Wade

First Edition

June 2013



Acknowledgements

Adelaide Unicare acknowledges the assistance of the Australian Government Department of Health and Aging, through a grant from the Telehealth Support Program.

I also wish to acknowledge the contributions of Jeremy Hamlyn, Frank Whittaker, Paul Daly, Kath McIntyre, Sue Johnson, Nigel Cord-Udy and Jon Jureidini to the content.

1. INTRODUCTION

1.1 The Aim of this eBook

The purpose of this e-book is to describe and discuss how to make telehealth work. It includes detailed descriptions of the clinical processes and procedures needed to effectively set up and operate telehealth services. There are many types of telehealth, however the main focus here will be on video consultations which increase access to specialist expertise. This is particularly relevant to Australia, although I hope those outside Australia may also find much of the content to be useful.

This book is not a technical manual. It contains a section about the qualities of technology and its effect on the clinical work, but the main topic is dealing with changes to the clinical model of care. This is a very important issue which has not received enough attention; introducing telehealth into a health care organisation or system creates a new model of care, and I will argue that getting this right is much harder than making the technology work, and is critical to the success of telehealth services.

The book is divided into four sections:

- + **Part 1** an introduction to telehealth and how it is being implemented in Australia
- + **Part 2** discusses the change management issues in more detail
- + **Part 3** is the “nuts and bolts” of the work. It contains a list of clinical disciplines and the specific issues for introducing telehealth in each area. Readers should feel free to skip directly to this section.
- + **Part 4** contains conclusions and recommendations for practice

1.2 Message to the Reader

As this is an e-book, I have tried to make it short, sharp and snappy. It is a first edition, covering just a few clinical disciplines, and over time I want to add additional areas of practice to the content.

I have, however, commenced with the areas of practice that were most requested by referring practitioners: mental health features strongly. Please send me your feedback and your own experiences in telehealth; these will be greatly valued and any contributions readers make to subsequent editions will be acknowledged. Contact me at: victoria.wade@adelaide.edu.au

1.3 Introduction to Telehealth

Telehealth is the delivery of health care at a distance, using information and communications technology. I will now briefly describe the characteristics of telehealth and how it has been implemented in Australia.

1.3.1 Modes of Telehealth

Telehealth is divided into two main modes:

1. Synchronous, or Real-Time

In real-time telehealth, the participants are interacting with each other simultaneously, for example by video consultations, telephone, live text transmissions or chat rooms. Scheduling is therefore very important.

2. Asynchronous, or Store-and-Forward

In this case, the participants are sending and receiving the information at different times. As the data is stored, the service can be operated with more flexibility of timing. Examples include sending photographs, emails, or patient data such as blood pressure or blood sugar readings. Perhaps the most common and widespread use is Picture Archiving and Communications Systems (PACS) in radiology.

1.3.2 Types of Participants

Telehealth can also be classified according to who is participating:

a) Provider to patient

For this type of telehealth a health care provider is at one site and the patient is at a distant site, such as their home or a local health care service.

b) Provider to provider

In this case the communication is between two or more health care providers, without the patient. Typical examples are when a primary care provider seeks advice from a specialist, or when a group of clinicians meet for case conferencing.

c) Remote and proximal provider to patient

This occurs when one health care provider is consulting with a patient at a distance, and a second health care provider is physically present with the patient. The two main reasons why this is useful are:

i) the proximal provider can assist with the tele-consultation, by managing the technology, introducing the patient to telehealth, and conducting a physical examination if one is needed, which the distant provider obviously cannot.

ii) if the proximal provider is taking responsibility for patient care after the tele-consultation, then a three-way conversation with the patient and distant provider can increase coordination of care and the local practitioner's ability to provide on-site care for the patient.

d) Health care students

Medical, nursing and allied health care students can all play important roles in telehealth. They can both assist the patient with a tele-consultation, and at the same time receive education in telehealth and discipline-specific clinical content.

Where the primary care site is hosting students, this becomes an important option for students to receive education in both telehealth and discipline-specific clinical content.

1.3.3 Types of Sites

When there are two health care providers involved plus the patient, it is helpful to distinguish the two health care sites in this way:

Initiating Site: the site in closest proximity to the patient and which usually provides the primary care. In most cases this site makes the initial referral or request for a telehealth service. However there are exceptions, for example when a hospital or specialist requests a telehealth consultation for discharge planning or post-procedure follow up.

Providing Site: this site provides the specialist expertise to the initiating practice, and is at a distance from the patient.



1.4 Telehealth in Australia

Before July 2011

The vast majority of telehealth services in Australia were operated by the State and Territory Departments of Health. They usually provided real time video consultations within the public health systems between larger urban public hospitals and smaller rural health services. Some were also used for case conferences and inter-hospital communication in urban locations(1). Medicare, the Australian universal health insurance system, supported only one type of telehealth in the private sector, which was telepsychiatry, and this was only used at a very low level(2).

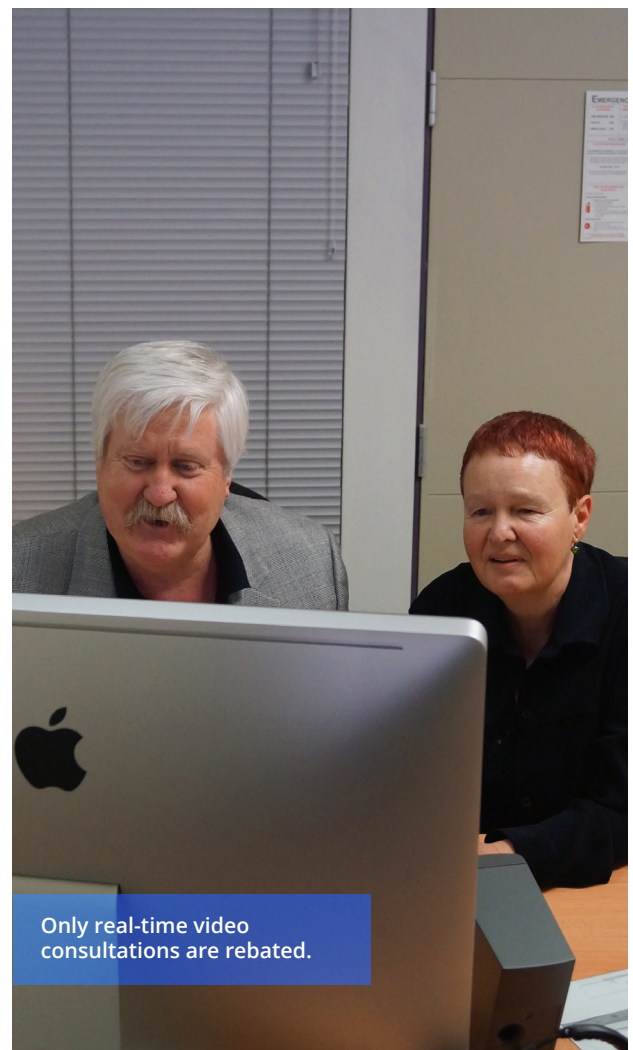
After July 2011

Medicare began rebating video consultations from all types of **medical specialists** to patients from the 1st July 2013. I will be paying particular attention to using the current Medicare Benefits Schedule (MBS) item numbers in Australia. Only **real-time video consultations** are rebated.

The two basic models of service delivery which are rebated under the MBS are:

- a) Provider-to-patient telehealth, where the medical specialist is at one site and the patient is at a distant site. For example, psychiatrists providing psychological management may conduct a video consultation direct to the patient's home.
- b) Provider-to-patient with a second provider, in which case the medical specialist is at one site and the patient is with a second health care provider at a distant site. The distant site is often a general practice, but could also be an Aboriginal Health Service or a Residential Aged Care Facility. It is also possible for the second provider to conduct a home visit and assist with the teleconsultation there.

The primary focus is telehealth consulting under the MBS, in which only medical specialists are rebated for providing care by video consultation, but the content is also applicable to other service models for telehealth. These include home care, allied health service delivery, or circumstances where both the GP and the specialist are both consulting with the patient virtually. As this is a living document, additional material about these models may be added later. The next section turns to the issue of change management in telehealth.



2. TELEHEALTH AND MANAGING CHANGE

Although there are strong arguments for implementing telehealth, the uptake of telehealth has been slow and difficult, not just in Australia, but in all parts of the world. Section two aims to explain this problem.

2.1 Why Telehealth?

The case for implementing telehealth is quite compelling:

- + Telehealth improves equitable access to healthcare: more, it addresses the structural types of inequity which are hard to solve and essential for health care reform(3).
- + Telehealth is a tool for better use of the health workforce: the rural workforce is better supported and the whole health workforce can be used more efficiently(4).
- + Telehealth provides more home care and better support for people with chronic diseases, their families, and carers(5).
- + Telehealth is a key to providing quality care to residents in aged care facilities(6).

There is research evidence to support each of these arguments, but the evidence is a work in progress. Overall, I think there is evidence that telehealth **can** provide these benefits to health care, but whether it actually **does** do this depends on the particular circumstances: what sort of telehealth, for which patients, where, and how?(7, 8). For more information about the evidence for telehealth, go to <http://www.e-unicare.com.au/evidence-for-telehealth/>

2.2 What is the Problem with Telehealth?

For the past 20 years, clinicians and researchers who are enthusiastic about telehealth have claimed that telehealth would soon become a major new way to deliver health care services. Expectations, promises, and just plain hype have been huge(9, 10). Instead, what has actually happened is that telehealth has been difficult to introduce into health care:

- + The uptake has been slow(11).
- + The numbers of patients seen has been small(12, 13).
- + Many telehealth services have not been sustainable(14, 15).
- + Many services have continued to exist on the sidelines of health care, not becoming part of the mainstream(16)

Telehealth experts have been tearing their hair out, or in more scientific language: “failure to adopt has dominated the scientific consideration of telemedicine for 20 years”(17). So why is this the case?

Firstly, most attempts to intentionally change health care delivery are difficult. It is hard enough to persuade clinicians to prescribe one antibiotic instead of another; it gets even harder when the innovation is complex, involving changes to professional roles, work flow and relationships(18). There might be very good arguments for introducing particular changes, but each single change has an impact on the overall functioning of a very complicated system, and hence meets a great deal of resistance or inertia(19).

Telehealth is a good example of a complex innovation; it changes these things:

- + The way in which health care providers work.
- + Referral patterns, clinical pathways and the patient journey.
- + Professional roles: who does what aspects of the clinical work.
- + The type, frequency and nature of communication between health care providers.

New roles for providers, such as telehealth coordinator, and telehealth consultation assistant, are created. As services develop and expand, they start to change the organisational structure of the health care services and the distribution of the health workforce. Is anyone now surprised that introducing telehealth is difficult? No, I thought not.

Telehealth is not like a new drug or a new operation: introducing telehealth is service development. This work is hard, slow, and requires great attention to detail. This book aims to help.

2.3 A Brief History of Telehealth

Although telehealth was introduced into health care from the early 1970s as demonstration projects, setting up ongoing services largely started from the mid 1990s. Despite predictions that telehealth would rapidly become a widespread method of health service delivery(20), the reality is that telehealth has largely been implemented as small scale services, short term pilot studies or research projects(1). This phenomenon has been commented on around the world and across many areas of telehealth(21), and has also occurred in Australia.

I am not surprised that telehealth is fragmented in private medical practice, which still largely consists of many small independent practices (the “cottage industry” model), but it is more surprising that this is also the case in the public health system. Looking inside the state-based telehealth services in more detail reveals that they also consist of small semi-autonomous units. How telehealth has developed in each jurisdiction is largely a function of the historic conjunction of particular clinicians and opportunities so, for example, Queensland has a long-standing telepaediatric service, South Australia a telepsychiatry service, and Western Australia has developed wound care and ophthalmology via telehealth.



As services develop and expand, they start to change the organisational structure of the health care services and the distribution of the health workforce.

2.4 Prior Research

There has been a large amount of research about telehealth, but most of it has covered patient outcomes, cost-effectiveness, or technical matters. I have pointed out the importance of service development, but for something that is so essential, this area has been badly neglected.

For those who are interested, these researchers have done work in this area:

Nicolini noted that little been done on the organizational aspects of telehealth, and he went on to say that “the take up of telemedicine results inevitably in the reconfiguration of the existing work practices and socio-material relationships. This new way of working triggers a variety of shifts in coordination mechanisms, work processes and power relationships in the health care sector.”(22).

Essen said that “in practice telehealthcare systems are highly problematic and demand that the organization of care work is radically re-engineered”(23).

Aas judged that the slow uptake of telemedicine was almost certainly due to a grave underestimation of the organisational problems(24).

Organisational factors also came up as one of the three main barriers to the implementation of e-health initiatives more generally, such as electronic records, decision support and health information systems(25).

Recent Research in Australia

I have conducted research on this area, gathering data from a diverse group of Australian telehealth services through qualitative interviews. I found that telehealth was much more than a simple substitution of one method of consulting with another. Looking at 35 different telehealth services I found that introducing telehealth resulted in these substantial changes to service delivery:

Work Flow

Most (80%) of the telehealth services changed the work flow of clinical care. This involved having to develop new systems for referrals, booking, coordination, record keeping and follow up. Typically, one respondent said that scheduling two rooms, two sets of equipment, the patient and a second clinician to be with the patient was “really quite a logistic exercise”.

Workload

Whilst telehealth has the potential of making healthcare more efficient by reducing travel time, this did not necessarily translate into reducing the workload of individual clinicians. For the clinicians providing care at a distance, in about 40% of cases their workload increased as they were asked to see more patients from additional locations. The main area in which telehealth decreased workload was not in seeing patients, but in saving time attending meetings, education events and case conferences.

Work Roles

Telehealth led to the introduction of new staff or new roles for existing staff in about 75% of cases. “Telehealth coordinator” is an interesting new role, that has an administrative component, but also often combines a clinical role such as triage or chronic disease management. Some telehealth coordinators may also have an educational role such as training or mentoring rural clinicians.



Communication and Collaboration

Most (about 80%) of telehealth services improved communication between clinical services. This ranged across improved discharge planning, case conferencing, chronic disease management, clinical audit and emergency care. I think this may well prove to be one of the great benefits of telehealth; as the health care system has become more complex, integration has become harder, and communication mishaps are now a common cause of adverse events and medico-legal cases. Shareable electronic health records are one way of dealing with this issue, however telehealth also helps by fostering more direct contact between clinicians, with subsequent increased trust.

Organisational Structure

This was much less common; only 20% of telehealth services made more than minor changes to the organisational structure of the health service. Where this did occur, these were things like a new organisational unit or a new clinical network being formed.

Model of Care

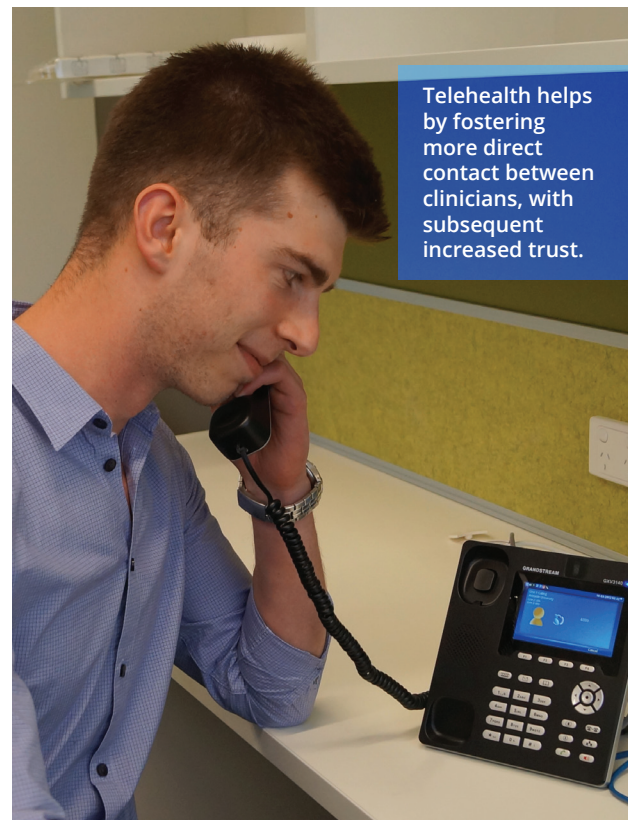
About half the telehealth services introduced a new model of care. It can be tricky to specify exactly what a model of care is, but I offer this working definition:

A model of care is a codified and coherent approach to providing services to a defined population of patients.

Examples of changes to models of care are the shift from individual care to team care in diabetes, cancer care, and palliative care, or the shift from specialist care to primary care for common mental health issues.

My research found that in some cases telehealth was instrumental in the development of whole new models of care, with increased use of guidelines, more clinical education, and greater control of the patient journey. One example of this is described in detail in Section 3.3.4 below; it happens to be in cardiology, but there are other Australian examples covering paediatrics, ophthalmology and burns care.

Such a new system cannot be imposed; it seemed to work best when created as a service to rural areas, in collaboration with rural clinicians, rather than as a top-down edict. The top-down approach led to resentment, with some examples of rural providers feeling that they were being dictated to by city hospital specialists, with subsequent lack of participation.



3. DATA FROM OUR TELEHEALTH PROJECT

This section introduces what we have learned about the processes and procedures needed to make telehealth work. This is the “nuts and bolts” practical part of the work. If you only read one section of this work, make it this one. I start with the administrative side, then give an overview of the clinical issues, consider some of the clinical disciplines in detail, then conclude with a brief discussion of technical issues.

3.1 Administration

3.1.1 Booking and Coordination

Booking and coordination is essential to making telehealth work. As there are two rooms, two clinicians and two sets of equipment to be managed at separate locations, this takes extra administrative work. Some particular points to note are:

Patient attendance – patients should be advised to arrive 15 minutes before the consultation. If the patient does not attend, two clinicians are affected, so patient reminders, either phone call or SMS, are particularly important.

Clinician with the patient – is a clinician needed to be with the patient; if so, is this a doctor, practice nurse, health care student, or other? Also, does the clinician need to stay for the entire consultation, or only for the introduction and conclusion to the consultation?

Record keeping – the health care service at each end of the video consultation keeps their own records.

Processes needing to be managed under this section include patient attendance, paper flow, coordination and immediate support of the patient.

3.1.2 Engaging with Medicare

Provider Numbers

As we supplied a video consulting room for specialists to work from, we looked into the issue of whether the specialists needed an additional provider number to work from this new physical location. We found that this was not necessary, because the specialists were working from our location only on a part time and temporary basis. If a specialist does move physical location to take up an ongoing telehealth practice, for example, starts working out of a video call centre for a substantial part of the working week, then yes, they will need an additional provider number if they are conducting Medicare eligible services.

Billing Options

The changes to billing depend on whether or not the specialist is using electronic records or billing, or are still using paper-based systems.

Documentation able to tie the billing at both sites together needs to be considered in order to meet audit requirements.

3.2 Clinical – General Comments

The following set of issues are relevant across a broad range of clinical disciplines and types of care provided.

3.2.1 Referral Pathways

This is a really important area to think about, because telehealth increases the referral options by enabling a wider range of specialists from different locations to be accessible to patients. Here are some different options for choosing which specialists to work with via telehealth:

1. *Specialists who already have a referral relationship with the general practice.* The advantage of this is that it is good for continuity of care, and it is possible for the patient to see the specialist in person if needed. However there may be gaps in existing specialist services that need to be filled by specialists who are not presently visiting or taking referrals from the practice.
2. *Specialists who are in the same catchment area for hospital referrals.* In this case, although the specialists may not know the specific referring doctors, they will know the health care system and the usual pathways that the patients will take if they need hospital services.
3. *Specialists from anywhere in Australia.* This is now possible due to national registration, and some telehealth services are advertising that they have a “bank” of specialists that referring doctors can choose from. This may contribute to fragmentation of care unless carefully managed.

The best type of referral pathway to select depends on the type of specialist care requested. If the practice has existing visiting specialists, then establishing telehealth with them is a good first step; as they are already seeing patients from the practice in person, they can use telehealth as an adjunct to care and are ideally placed to be able to gradually extend the use of telehealth as both parties gain more experience.

If the practice is going to start working with new specialists via telehealth, then the scope of practice needs to be discussed, as well as how the patients are going to be followed up if an in-person consultation is needed.

There are, however, some circumstances where it may not be necessary for a specialist to be able to see the patient in person. This applies particularly to consulting sub-specialists who are conducting one-off assessments which are primarily about obtaining a detailed history and having a discussion with the patient. Clinical genetics is a good example of this; there are only a few clinical geneticists in each state or territory, located in the capital cities, and it is not possible for them to travel to all rural locations. Furthermore, much of their work can be done either without a physical examination or with the assistance of a health care provider proximal to the patient. In theory, then, the clinical geneticist could be located anywhere in Australia, although it is still helpful if he or she is in the same jurisdiction as the patient, because of their knowledge of the local health care system.



The importance of trust

Although health care is increasingly a team-based activity, most practitioners are used to consulting with the patient on their own, or with their own staff assisting, whereas telehealth invites, and sometimes demands, a partnership approach. If the specialist requests a physical examination for a patient whom they are seeing via video communication, then they want to trust in the knowledge and skills of the provider with the patient. This trust may take some time to develop. Two ways we have seen specialists dealing with this issue are:

- + Only do telehealth with general practitioners that they already know.
- + Only do telehealth with general practitioners that have attended an education course they have conducted.

Both of these approaches give the specialist confidence that the quality of clinical care will not be compromised by introducing telehealth. When telehealth becomes much more widely used, these skills might be just assumed, but the area is not sufficiently developed for this to be the case at present.

3.2.2 Scope of Practice

Determining the scope of practice is about clarifying and specifying what type of clinical work the specialist will be providing via telehealth. Each clinical discipline is different in terms how much of usual practice is able to be provided by telehealth. There are also likely to be differences between individual clinicians in the same discipline. During this developmental period in telehealth, most clinicians are not aware of how much of their work can be done via video consultation as they have not been taught about or previously exposed to this method of working.

There will be a few disciplines where a large proportion of the work can be done through video consulting: for example dietician/nutritionist consulting, or some types of mental health work. On the other hand, in other disciplines video consulting is one component of a total episode of care, for example when it is used for post-operative follow up. For a more academic discussion of this issue, see the recent paper by Locatis, which suggests three principles for determining when it is appropriate to use telehealth in the medical specialties; these principles are congruity (similarity with in-person care), fidelity and reliability(26).

3.2.3 Safety of Staff and Patients

This has been developed specifically for telepsychiatry, but is described here as it has general application to other types of video consultations.

Referrals

Patients who are known to be acutely mentally unwell should not be referred for video consulting in the first place, but rather, dealt with in the usual way, such as referral to the Acute Crisis Intervention Service (ACIS).

This is because the psychiatrists conducting assessments by video consultation are doing so with the aim of assisting the patient's GP to manage the patient's care, and are not able to admit mental health patients for inpatient care.

However it may only become obvious at the time of the video consultation that the patient is acutely mentally unwell, and in this situation the psychiatrist should be able to offer advice and assistance to the GP on acute management and disposition of the patient.

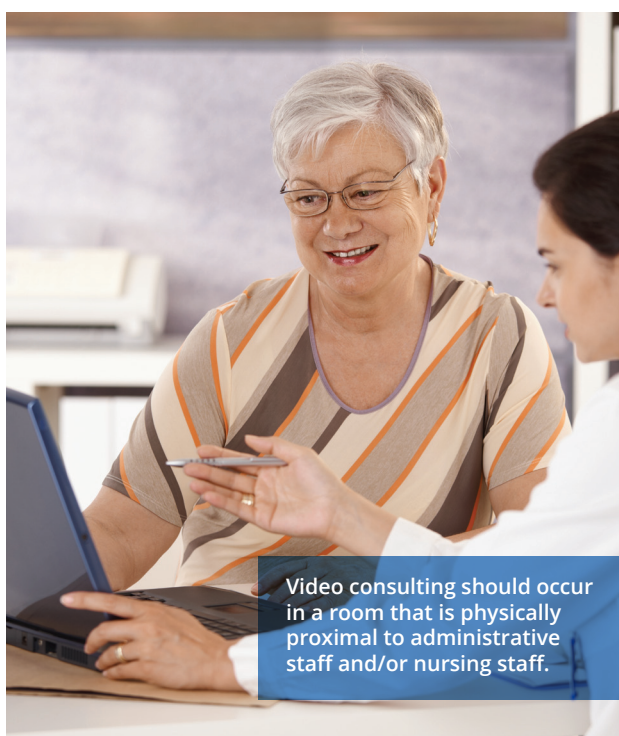
Procedures

Video consulting should occur in a room that is physically proximal to administrative staff and/or nursing staff.

Clinical staff should accompany the patient for the initiation and conclusion of each video consultation, or for the entire consultation if requested by the psychiatrist or the GP.

The psychiatrist at the remote end should be able to request immediate nurse assistance at the patient end, and be given a direct number to call. This should not be the general reception number of the practice, as this can be engaged, or they may be put on hold by reception staff.

If the psychiatrist judges the patient to be acutely unwell and in need of detention under the Mental Health Act, the psychiatrist should be able to ask one of the on-site medical practitioners to assist with this process.



3.2.4 “Failed telehealth consultations”

Even an inappropriate or unsuitable referral can be useful: we had an example of a referral for a psychiatry assessment that the psychiatrist judged was not suitable for a video consultation. Rather than a one-off consultation liaison assessment, the nature of the problem indicated that ongoing care was going to be needed. However, the psychiatrist expedited the patient obtaining access to care, so making the attempt to set up a telehealth consultation led to better coordination of care. This illustrates that having a telehealth system can improve communication between providers even when the video consultation does not actually occur.

The other circumstance that can arise is where the video consultation is conducted but is not complete, and an in-person consultation is needed as well. Rather than regarding this as a failure, in actuality a proportion of the work has already been done, and the in-person consultation can proceed with information already gained. An endocrinologist explained to me that whilst he did want to examine patients with complex problems himself, he was very willing to conduct initial consultations with rural patients by telehealth, order some investigations, and then do the physical examination at his next visit to the rural location. This is not a failure of telehealth, but rather a way of working which starts the total process of assessment in a more timely fashion for the patient

3.3 Clinical – Specific Disciplines

We have investigated the process changes needed for a range of clinical disciplines, starting with the areas most requested by referring sites, and the ones for which we have initiated clinical services. This section does not attempt to cover all clinical disciplines. We hope to expand the content to include other disciplines in subsequent editions.

3.3.1 Mental Health

3.3.1.1 Adult Psychiatry

i) Scope of Practice

The type of psychiatry practice to be delivered via telehealth needs to be discussed. The typical services provided by psychiatrists are:

- + Emergency assessments
- + Inpatient care
- + Consultation-liaison
- + Ongoing management (psychotherapy or case management approach)

Emergency Assessments

The purpose of emergency assessments often includes making a judgment about whether or not the patient could or should be detained under the relevant Mental Health Act. Also these assessments offer advice about immediate management of the patient's condition.

In South Australia, the public health system operates a telepsychiatry service through the Rural and Remote Mental Health Services (RRMHS). When it is known in advance that the consultation will be for consideration of detention this is the most appropriate service for this type of assessment. This is because detention under the Mental Health Act will be to a public facility.

As described earlier, that the patient is seriously unwell may only be discovered during a regular booked telepsychiatry appointment with a private psychiatrist. In that case the psychiatrist conducting the tele-consultation may need to advise or assist the primary care clinicians in handing over the patient to the public sector.

Inpatient care

At present, in Australia, private inpatient psychiatric care is not provided by telehealth.

Many private psychiatrists would be willing to give advice to a rural GP who has admitted a patient to a rural hospital for a psychiatric reason, particularly if the psychiatrist has a pre-existing relationship with the rural general practice, but Medicare does not rebate video consultations to patients who are hospital inpatients, so there is no financial incentive to do so.

Also the private psychiatrists we have discussed this with said they would be unwilling to manage a rural inpatient directly via video consultation. As with many other aspects of telehealth, the issue is not just about how much the specialist can provide at a distance, it is also about what facilities are available locally. For example, how much experience the hospital nurses have in mental health, the physical environment of the ward, and which other services such as psychology or occupational therapy are available.

Consultation-Liaison

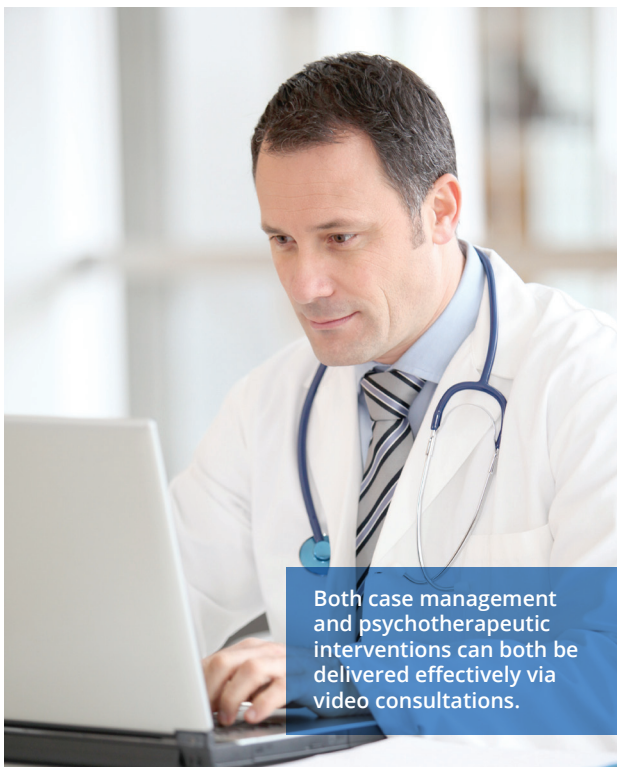
The psychiatrists we have spoken to prefer their telehealth work to use a consultation-liaison model, whereby the psychiatrist does not take on primary responsibility for the patient, but consults to the other health care providers who do have this role. In private practice, this involves utilizing Medicare item 291, to conduct a comprehensive assessment and delivering a management plan to the patient's GP which covers the next 6 months or so. Some of the patients may need more than one tele-consultation for a complete assessment, or may need follow up in less than 6 months.

The advantage of working in this way is that the psychiatrist can set aside more of their time to consult to GPs. If the psychiatrist takes on the whole treatment of the patients, then most of their week will quickly be taken up with ongoing management. There may, however, still be pressure from referring services on the psychiatrist to take on the total management of the patient.

Ongoing Management

There is evidence that both case management and psychotherapeutic interventions can both be delivered effectively via video consultations(27, 28). These can, but need not be, conducted by medical specialists; other members of the mental health team such as psychologists, social workers and mental health nurses are also involved in this type of care.

I have worked directly in both of these areas; I helped to set up and manage a telepsychology service delivering cognitive behaviour therapy, and ran a trial of delivering mental health case management via videophones, both to rural areas of South Australia, each of which showed that this method of delivering services is feasible and effective. There is good potential for these aspects of mental health services to be delivered by allied mental health workers if a resourcing model is available.



Both case management and psychotherapeutic interventions can both be delivered effectively via video consultations.

ii) Location of the Patient

Should the patient always be at a local health service, or is it acceptable to consult with the patient directly at their home?

Distress: the first issue is that if the patient becomes distressed as a result of a telehealth consultation direct to the home, there is no-one immediately at hand to give professional assistance.

Privacy: it is often said that it is more private to consult to the home rather than to a health service. Patients may be reluctant to attend a mental health service because of stigma, although this is much less so for attending a general practice. On the other hand, we have seen examples where delivering a psychotherapeutic intervention to the home has been a problem because the patient's partner or family has been in the background during the tele-consultation. In this case, privacy from those the patient lives with needs to be discussed at the commencement of the service.

We have found that the impact of these issues relates to the purpose of the tele-psychiatry consultation. Our preliminary recommendation is that initial assessments or psychotherapy sessions are better conducted at a health service. In both cases, a local health care provider is available in case of distress, and in the case of an assessment, the health care provider can discuss the outcome with the specialist. Case management, on the other hand, may very usefully be delivered to the home. Our trial of seeing rural Vietnam veterans via home videophones for case management found that the patients did well with more frequent but shorter consultations; usually twice a week of 15 to 20 minutes each. Also, the veterans could have additional video consultations in case of an exacerbation, which both the staff and patients that participated in the study said assisted in avoiding hospital admissions.

3.3.1.2 Child and Adolescent Psychiatry

There are far fewer child and adolescent psychiatrists than adult psychiatrists and many of those that do exist work in the public sector in Child and Adolescent Mental Health Services (CAMHS). Because there is such a high demand for assistance in this clinical area, CAMHS services have a triage system, whereby a child and their family are seen for assessment reasonably rapidly, but unless the problem is both serious and urgent, they are then placed on a waiting list for treatment, which can be several months or longer. CAMHS services are also very thin on the ground in rural areas. General practitioners therefore have difficulty in accessing this form of specialist assistance for their patients.

The solution we are in the process of developing in South Australia is described here, and may be a useful model for other areas. It does, however, rely on a clinical champion, so might not be possible to implement in all areas. How it works is that the child and adolescent psychiatrist runs one-day workshops for GPs. After the workshop, the attendees are then able to either call him for telephone advice or they will also be able to book their patients for a video consultation. However, the GP will need to attend the video consultation with the patient (and family if they are also attending).

The reason for running the service in this way is that it is specifically set up to provide increased skills to GPs, so that over time GPs become able to manage more of these cases themselves. Thus, primary care in child and adolescent psychiatry starts to develop. This is another example of how telehealth can be used as service development. It does keep the size of the service manageable as it is only available to the GPs who are willing to attend training and actively participate in the management of the patients. So far about 200 GPs in South Australia have attended the workshops.



CAMHS services are also very thin on the ground in rural areas. General practitioners therefore have difficulty in accessing this form of specialist assistance for their patients.

3.3.1.3 Psychology

The model we are currently operating is of psychologists supplying services to rural clients, alternating in-person consultations with video consultations. In general psychologists say that they prefer to see the client in person for the initial consultation where possible, although this is not essential.

The processes that are important for psychologists to be able to do their work are:

Diagrams: many psychologists find it very useful to draw diagrams during the consultation. Some telehealth setups have a separate document camera but most do not, and in that case a small whiteboard on a stand is helpful.

Written materials: most psychologists have a range of handouts to assist clients with specific situations. These can be posted or emailed, but the effect is more immediate if there is a printer set up in the client consulting room which can be activated by the distant psychologist.

Psychological testing: this is a work in progress. Some psychological tests can be conducted at a distance and others cannot. The issues that need to be resolved are:

- + Which tests are suitable for telehealth. Some have been adapted to an online environment, and in this case the client could, with appropriate instructions, do them online before the video consultation.
- + For paper-based tests, the psychologist needs an assistant at a distance who can access the testing materials and set them up for the client.
- + What degree of supervision the client needs during the testing.

Behavioural assessment: often, this refers to children's behaviour problems, including assessment for attention deficit or autism spectrum disorders.

Sometimes, formal assessments are needed for the patient to access specific programs or other resources at school. There is preliminary evidence that this type of assessment is possible to do via telehealth, but

Safety of practice: this is as important as it is for psychiatry; see the section on patient and staff safety under Adult Psychiatry.

3.3.2 Pain Management

Initiating telehealth consultations in pain management has involved the development of a new model of care.

Since pain management is a multi-disciplinary specialty, the current model involves the patient attending a clinic in which they see several service providers who then jointly come to a diagnostic and management formulation.

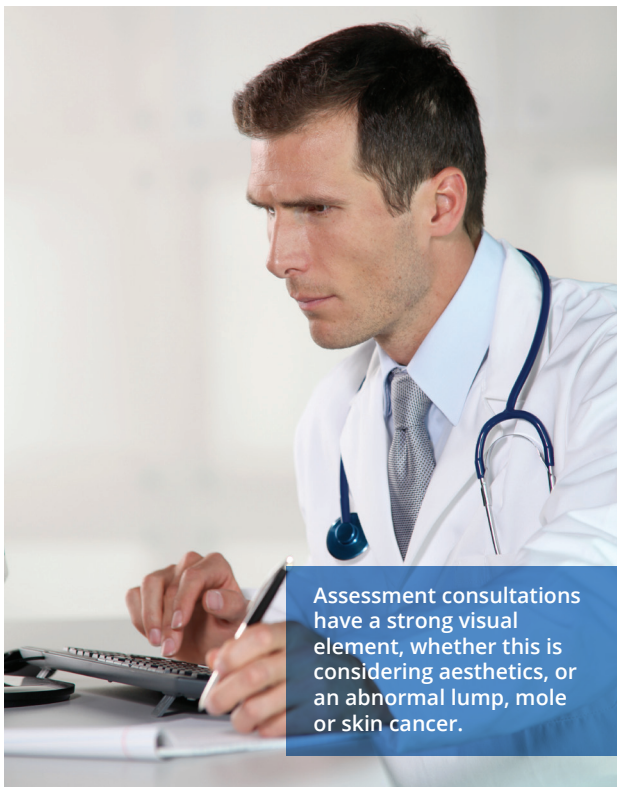
All pain management specialists, in both the public and private sectors, are extremely busy. Waiting list times are 3 to 4 months for private pain management clinics, and up to two years for public clinics.

When using telehealth for pain management the things that need to be considered are:

- + what forms of treatment and/or management are available at the requesting site? As well as medication; psychological intervention, pain management education and support groups, and exercise are all potentially valuable aspects of the treatment.
- + what information does the specialist want about the patient before the video consultation? Typically pain management units have a proforma which the patient fills in beforehand, therefore a system is needed at the initiating site to collect this information from the patient and send it to the specialist.

In our service the patients are sent a 10 page form to fill out before the teleconsultations, which includes a detailed history of the pain, asking the patient to mark body diagrams with the location of the pain, and also record its intensity, fluctuations and duration. In this way, the pain management specialist begins the consultation with much of the history already provided. The referring practice, however, needs to ensure that this information is received and sent on to the specialist before the consultation.

One pain management specialist cannot provide a service to all rural areas of the state, so we are investigating working through the Pain Society to set up a service with several specialists in the area. Hence service development can move from working with individual providers to developing a model of care through professional associations.



3.3.3 Plastic Surgery

We interviewed a plastic surgeon who has been using video consultations for over ten years, to gain an understanding of the role of telehealth in plastic surgical practice. From this, he said that video consultations were useful in the following areas:

Booked Patient Assessment: he said that assessment consultations have a strong visual element, whether this is considering aesthetics, or an abnormal lump, mole or skin cancer.

Urgent ad hoc Patient Assessment: typically this involves giving another doctor advice a hand injuries and related matters.

Post-Operative Followup: for rural patients video consultations have been used for post operative consultations, preferably with a nurse assisting the patient. At this consultation the pathology results are discussed, and the nurse can receive information on the care and management of the wound.

3.3.4 Cardiology

The important issue in cardiology is that video consulting is only one component of providing a cardiology service at a distance. There is a very interesting and effective example of a tele-cardiology service in South Australia, called the **Integrated Cardiovascular Clinical Network (ICNet)**. This was specifically set up to support rural health services in responding to acute patient presentations. The different components of the service are:

- + A roster of cardiologists who are on-call to the service.
- + A network of point of care testing machines which enable rural hospitals to immediately conduct the blood tests that are needed when a patient presents with chest pain.
- + A network of ECG machines which transmit their results to the cardiologists and into a shareable electronic record.

- + A system to deliver thrombolytic drugs to rural hospitals so that they can be quickly administered to patients. As these drugs are expensive they are rotated around the rural hospitals so that they can be most efficiently used before going out of date.
- + A set of guidelines produced by ICCNet on the management of chest pain, displayed as large laminated posters on the walls of the emergency departments of rural hospitals.
- + And finally, the ability to conduct a video consultation between the patient and rural practitioner and the cardiologist

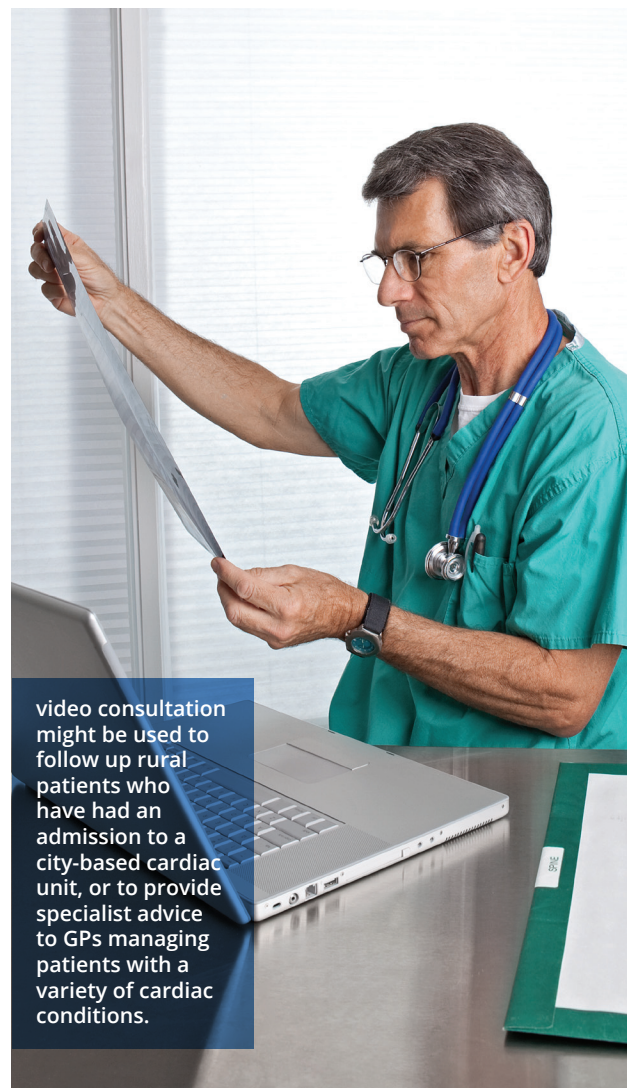
This is a very clear example of how telehealth is service development; it began several years before Medicare telehealth item numbers and supplies several other services apart from video consulting. It relies on both the public and the private sector cardiology services working together, and is a model that could very well be considered for broader implementation. Over this time, the death rates from acute coronary syndrome in rural South Australia have reduced to the same rates as they are in the metropolitan area. Whilst it is not proven that ICCNet caused this reduction, it is a strong hypothesis that this is the case.

Given that there are so many components to a rural cardiology service, what is the role of video consulting? This can be divided into acute care and chronic disease management:

Acute care: video consulting has a specific role in assessing patients with chest pain who have a normal ECG and normal blood tests. In this case the rural doctor has to decide between admitting the patients to hospital for further observation, or diagnosing them with indigestion and sending them home. The consequences of making the wrong decision can be fatal, but equally it is not possible or desirable to admit all of these patients all the time. A video consultation with a cardiologist can help with this decision.

Note that provided the patient has not yet been admitted to a hospital, but is attending the emergency department as an outpatient, the cardiologist can claim a Medicare rebate for this consultation.

Chronic disease management: this is more straightforward, in that a video consultation might be used to follow up rural patients who have had an admission to a city-based cardiac unit, or to provide specialist advice to GPs managing patients with a variety of cardiac conditions.



3.3.5 Geriatrics

Using telehealth for geriatrics is very much about a shared care model. It relies on the geriatrician and the GP having a good working relationship, and being familiar with local services and supports.

Geriatric Assessment

One model of providing geriatric assessment at a distance has been researched by the Centre for Online Health at the University of Queensland. In this case the local nurse initially sees the patient and administers a battery of standard cognitive tests, then the psycho-geriatrician interviews the patient, and formulates a diagnosis based on the combination of the interview and the test results. This was found to give results similar to in-person assessment(29). The locally based nurse, however, needs to have training in giving the tests, and in private practice it may be more difficult to implement that process.

Accessing Anti-Dementia Medication

There are a group of medications prescribed to treat early dementia, which are effective for some patients in slowing down the deterioration from the disease. Until recently, they could only be prescribed by specialists, however this made it hard for patients in rural areas to access the medication. The rules were therefore changed to allow a general practitioner to prescribe, but this must be in consultation with a specialist. This is a possible use for a video consultation, whereby the specialist can also see the patient.

Behavioural Issues

If a patient is being cared for at home or in an aged care facility, the GP might want to seek advice about management of aggression, wandering, or other behavioural issues. These are ideally dealt with by also bringing the relatives, carers, or aged care facility staff to the video consultation, as they are dealing with the issues on a daily basis.

Whereas some adjustment in medications may be needed, many of the solutions are also about making environmental modifications, or working out how to best respond to the person.

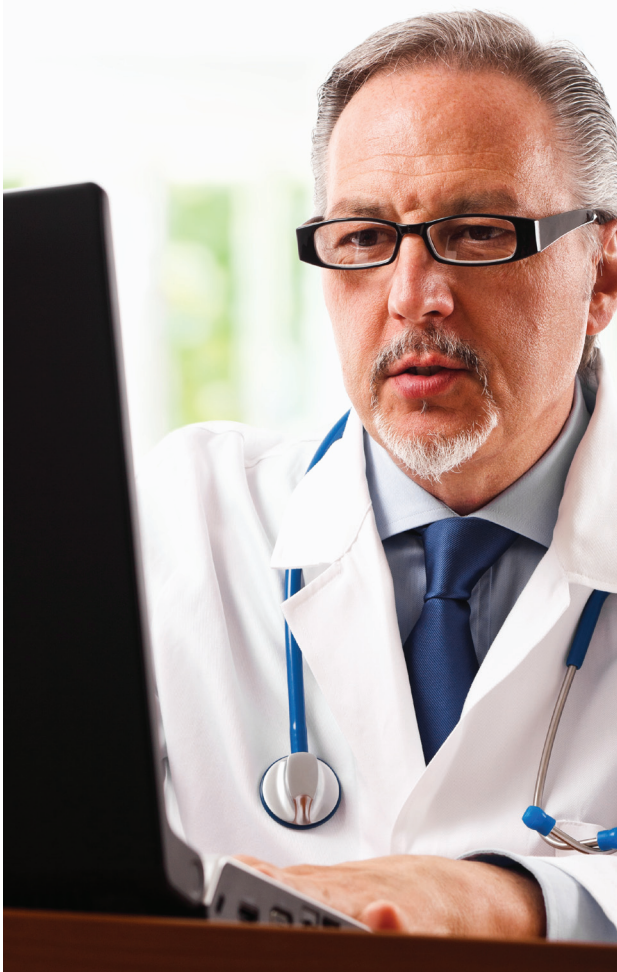
3.3.6 Dermatology

Most tele-dermatology in Australia is store-and-forward, in which the GP takes a photograph of a patient's skin condition and sends this to a dermatologist for an opinion. There are no Medicare item numbers for this clinical activity, but some private dermatologists are supplying this service to the GPs who usually refer patients to them, without charging the patient. If this is done informally and on a fairly low level, this is rather like the telephone advice that nearly all specialists are happy to give to GPs with whom they are associated. However, as this practice increases, it has become more than an ad hoc activity, and how this should be developed as a new type of service has become an issue.

The Australian College of Rural and Remote Medicine (ACRRM)

ACRRM operate a service, called **TeleDerm**, <https://www.acrrm.org.au/> which shows how store-and-forward dermatology can be implemented in an organised fashion, providing both clinical and educational benefits. The GPs send their de-identified photographs together with brief patient histories to a web portal, and this data is accessed by a dermatologist who posts a reply, usually within 24 hours. All cases posted on the portal are able to be seen by the group of registered users, who must be rural medical practitioners or doctors in training, so as well as being able to look at their own cases, the referring medical practitioners can also browse through a large bank of cases to increase their knowledge. The web site also has other educational features, such as regular case quizzes and practical tips. This is a good example of using telehealth to develop a community of practice.

Real time video was very useful for demonstrating practical procedures such as wet wrapping for treating children with atopic dermatitis.



In this circumstance, it is obviously important to have procedures to protect patient privacy, and these are:

- + The website is password protected and managed in a secure manner.
- + Only registered medical practitioners are authorised to use the site.
- + The patients are not identified on the site unless they give specific informed consent; this means that there are some limitations in showing photographs of patients' faces.

Real-time Video in Dermatology

What, then, is the role of real time video communication in dermatology? Some dermatologists argue that it is minor, however we started a telehealth service in a situation where the dermatologist visited a distant site in-person about every 6 weeks, but found the workload was becoming unmanageable. The solution was to only see new patients in-person, and to see all the follow up appointments in a weekly telehealth session. The feedback we received from the dermatologist was that direct communication to the patient was valuable when the patient needed to be motivated and actively involved with treatment. A GP was with the patient and also said that she learned a lot about dermatology through this process. Another dermatologist we spoke to said that real time video was very useful for demonstrating practical procedures such as wet wrapping for treating children with atopic dermatitis.

3.4 Technical Issues Relevant to Telehealth Processes

These issues have become apparent from our log of technical matters.

Reliability

The longer the consultation, the higher the probability that video communication will have an episode of degradation of quality or a total drop-out. The reliability and stability of the communications infrastructure will be tested the most by long consultations such as psychiatric assessments. Also, in the case of mental health assessments, total video drop out may lead to the patients simply leaving the room.

Technical support

The time taken to put back a dropped connection is very important. Technical difficulties make telehealth inefficient. When telehealth is inefficient, a rural practice might use it for occasional assistance in an urgent situation, where the clinical value is very high, but will not take it up for routine practice, and this will affect the overall uptake plus the business viability of telehealth. In regard to the hours required for technical support, although we ran an after-hours service, nearly all of our work was in hours.

Quality of the Picture

For many uses of telehealth, clinicians have told us that a small picture is quite adequate to do the job. Psychiatrists have consistently said that they obtain better value from a larger image with higher definition, to detect nuances of facial expression and body language. Even in these circumstances, we have found that so-called "standard definition" video communication is all that is needed to do the work, provided that it is reliable, the frame rate is around 15 or more a second, and the lighting is good. This is the standard was used for much of the research which concludes that video assessment is reliable(30).

Our technical team has concluded that "high definition" video, which is marketed by some as essential for telehealth, is not actually necessary, but rather, it can lead to technical difficulties, because it takes four times the bandwidth for accurate transmission. Where we have had fibre connections, we have been able to introduce high definition video transmission.

Quality of the Sound

One problem is that many systems of video communication do not pay enough attention to the audio channel. Most video consultation can take place if the picture is a little blurry or jerky, but it is very difficult for the consultation to continue if the sound quality is poor or intermittent.

We have found that the inbuilt speakers and microphones supplied with typical desktop and laptop computers do not give good audio quality. This is because they are invariably small and placed too close together, hence they have a limited dynamic range, and are prone to distortion and feedback.

Thus we have moved towards using external microphones and speakers wherever possible. These do not need to be hi-fi or studio quality; the actual quality of the audio transmission over IP or ISDN networks is not that high, so there is very little added benefit in using peripheral equipment that is designed for professional recording and broadcasting.

In a nutshell, any external speaker gives a substantial improvement. Microphones are more complicated, but the simplest answer is to use an omnidirectional microphone and keep it away from the computer and the speaker.

4. RECOMMENDATIONS

I hope that I have now amply demonstrated that initiating telehealth is service development. I have given specific examples of how this has been accomplished in a range of clinical disciplines, and now I will bring what we have learned together from this project plus other research I have conducted on implementing telehealth in Australia. To conclude, I recommend that one should:

Support individual champions

Starting a telehealth service is much more work than “business as usual”, and people willing to put in the extra effort, sometimes over several years, are rare. Telehealth is most often initiated by champions: enthusiastic individuals that drive uptake(31). This is essential to getting telehealth started, but can lead to initial uptake being uneven and fragmented.

Seek acceptance from the majority of clinicians

There are two components to this; one is disseminating the evidence that telehealth is an effective form of practice; we are contributing to this through the evidence pages of our website <http://www.e-unicare.com.au/evidence-for-telehealth/>

The other is addressing concerns about the acceptability of telehealth in clinical practice. I have published an article about ethical and medico-legal issues in Australian telehealth services, indicating that there were issues, but that these were readily able to be addressed in practice(32).

Build relationships between services and between clinicians

Telehealth can only function if the relationships between clinicians are supported. When a service is being newly established, this is what takes most of the time and effort to set up. It is one of the roles of the telehealth coordinator, telehealth project officer or clinical champion.

Develop a clinical-technical partnership

Having a balanced clinical-technical partnership can really help move telehealth forward. Be wary of a lack of balance which may be manifested by technology experts who do not listen to clinicians, or clinicians who have tried to turn themselves into technical experts.

Choose a sustainable model of operations

Two models that work are i) to fit a low level of telehealth activity into an existing health care service, or ii) to develop a new service which is large enough to sustain itself with sufficient referrals and activity to justify dedicated staff and infrastructure(1).

I welcome feedback or comments from those who wish to have a discussion, offer a critique, or add new material to this work. I can be contacted at victoria.wade@adelaide.edu.au

REFERENCES

1. Wade V, Elliott J, Karnon J, Elshaugh AG. A qualitative study of sustainability and vulnerability in Australian telehealth services. *Stud Health Technol Inform.* 2010;161:190-201.
2. Smith AC, Armfield NR, Croll J, Gray LC. A review of Medicare expenditure in Australia for psychiatric consultations delivered in person and via videoconference. *J Telemed Telecare.* 2012;18(3):169-71.
3. Bashshur RL, Shannon GW. National telemedicine initiatives: essential to healthcare reform. *Telemed J E Health.* 2009;15(6):600-10.
4. Moffatt JJ, Eley DS. The reported benefits of telehealth for rural Australians. *Aust Health Rev.* 2010;34:276-81.
5. DeVany M, Alverson D, D'lorio J, Simmons MS. Employing telehealth to enhance overall quality of life and health for families. *Telemed J E Health.* 2008;14(9):1003-7.
6. Mitchell EI, Rhodes LM, Grossman K. Telehealth's promise for the nation's long-term care residents. *Physician Exec.* 2004;30(2):52-5. Epub 2004/04/17.
7. Wade VA, Karnon J, Elshaug AG, Hiller JE. A systematic review of economic analyses of telehealth services using real time video communication. *BMC Health Serv Res.* 2010;10:233. Epub 2010/08/11.
8. Ekeland AG, Bowes A, Flottorp S. Effectiveness of telemedicine: a systematic review of reviews. *Int J Med Inform.* 2010;79:736-71.
9. Merrell RC. Telemedicine in the 90's: beyond the future. *Journal of medical systems.* 1995;19(1):15-8. Epub 1995/02/01.
10. Bangert D, Doktor R, Warren J, editors. *Introducing telemedicine as a strategic intent.* 32nd Hawaii International Conference on System Sciences; 1999; Hawaii.
11. World Health Organisation. *Telemedicine: opportunities and developments in member states: report on the second global survey on eHealth.* Geneva, Switzerland: 2010.
12. Hailey D, Ohinmaa A, Roine R. Limitations in the routine use of telepsychiatry. *J Telemed Telecare.* 2009;15(1):28-31.
13. Day M, Demiris G, Oliver DP, Courtney KL, Hensel BK. Exploring underutilisation of videophones in hospice settings. *Telemed J E Health.* 2007;13(1):25-31.
14. Lamminen H, Semberg V, Ruohonen K, Roine R. A three-year follow-up of Finnish telemedicine programs. *IEEE Trans Inf Technol Biomed.* 2001;5(2):174-7.
15. Obstfelder A, Engeseth K, Wynn R. Characteristics of successfully implemented telemedical applications. *Implementation Science.* 2007;2. Epub 2007/7/27.
16. Kerr K, Norris T. Telehealth in New Zealand: current practice and future prospects. *J Telemed Telecare.* 2004;10 Suppl 1:60-3. Epub 2004/12/18.
17. Merrell RC, Doarn CR. Editorial: barriers or barricades. *Telemed J E Health.* 2012;18(2):79-80.
18. Plsek P. *Complexity and the adoption of innovation in health care.* Washington DC: National Institute for Health Care Management Foundation, 2003.
19. Coiera E. Why system inertia makes health reform so difficult. *BMJ.* 2011;342:d3693.
20. Doarn CR, Yellowlees PM, Jeffries DA, Lordan J, Davis S, Hammack G, et al. Societal drivers in the applications of telehealth. *Telemed J E Health.* 2008;14(9):998-1002.
21. Grigsby B, Brega AG, Bennett RE, Devore PA, Paulich MJ, Talkington SG, et al. The slow pace of interactive video telemedicine adoption: the perspective of telemedicine program administrators on physician participation. *Telemed J E Health.* 2007;13(6):645-56. Epub 2007/12/21.
22. Nicolini D. The work to make telemedicine work: a social and articulative view. *Soc Sci Med.* 2006;62(11):2754-67. Epub 2005/12/14.
23. Essen A, Conrick M. New e-service development in the homecare sector: beyond implementing a radical technology. *Int J Med Inform.* 2008;77(10):679-88. Epub 2008/06/03.
24. Aas IHM. *The Organisational Challenge for Health Care from Telemedicine and e-Health.* Oslo, Norway: The Work Research Institute; 2007 27 October 2012]. Available from: http://www.afi.no/stream_file.asp?iEntityId=2088.
25. Mair F, May C, Finch T, Murray E, Anderson G, Sullivan F, et al. Understanding the implementation and integration of e-health services. *J Telemed Telecare.* 2007;13(Suppl 1):S1:36-7.
26. Locatis C, Ackerman M. Three principles for determining the relevancy of store-and-forward and live interactive telemedicine: reinterpreting two telemedicine research reviews and other research. *Telemed J E Health.* 2013;19(1):19-23.

27. Norman S. The use of telemedicine in psychiatry. *Journal of psychiatric and mental health nursing*. 2006;13(6):771-7. Epub 2006/11/08.
28. Backhaus A, Agha Z, Maglione ML, Repp A, Ross B, Zuest D, et al. Videoconferencing psychotherapy: a systematic review. *Psychological Serv*. 2012;9(2):111-31.
29. Martin-Khan M, Varghese P, Wootton R, Gray L. Successes and failures in assessing cognitive function in older adults using video consultation. *J Telemed Telecare*. 2007;13(Suppl 3):S3:60-2.
30. Hyler SE, Gangure DP, Batchelder ST. Can telepsychiatry replace in-person psychiatric assessments? A review and meta-analysis of comparison studies. *CNS Spectrums*. 2005;10(5):403-13.
31. Wade V, Elliott J. The role of the champion in telehealth service development: a qualitative analysis. *J Telemed Telecare*. 2012;18(8):490-2.
32. Wade VA, Elliott J, Hiller JE. A qualitative study of ethical, medico-legal and clinical governance matters in Australian telehealth services. *J Telemed Telecare*. 2012;18(2):109-14.