

### Telehealth and the use of video conferences: A Rapid Review

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**Citation** Corey Joseph & Angela Melder. June 2018. Telehealth and the use of video conferences: A Rapid Review. Centre for Clinical Effectiveness, Monash Health, Melbourne, Australia.

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### Executive Summary

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#### Background

Telemedicine or telehealth is an emerging area where information technology is fast being integrated into healthcare services. One aspect of telemedicine is the use of video, called 'video conferencing', for patient-clinician consultation. At Monash Health, a video conferencing program is being established in a range of clinical areas. Therefore, the purpose of this review was to assist in informing the development a new video conference service. Specifically, the objective of this review was to search and synthesise the evidence regarding efficacy, cost, sustainability and appointment attendance and the use of video for clinical consultation in the following clinical areas: diabetes, nephrology, oncology, haematology, genetics, pain management, medication review, infectious disease.

#### Summary of findings

- Seven studies met the inclusion criteria for this study.
  - One review explored the use of Skype for video conferencing.<sup>2</sup>
  - One review explored the use of in-hospital telemedicine, including video conferencing.<sup>1</sup>
  - With respect to patient populations, studies focused on patients with diabetes,<sup>3</sup> Aboriginal and Torres Strait Islanders,<sup>4</sup> and patients with chronic conditions, including diabetes.<sup>6</sup>
  - Reviews also focused on patient satisfaction,<sup>5</sup> and the success and sustainability of telehealth in and remote and rural Australia.<sup>7</sup>
- Skype has been used to deliver video conferencing and is a low or no-cost tool that can be used for the delivery services to patients.
- Video conferencing provides a high level of satisfaction for healthcare workers, paediatric and indigenous patients.
- Factors associated with the success and sustainability of video conferencing services include the following:
  - *Vision* related to having a clear, realistic goal defining the purpose of the service.
  - *Ownership* related to the clinical need, motivation and purposeful development of the service; success required both clinicians and management to be 'on board' and supportive of the initiative.
  - *Adaptability* related to the recognition of the requirement to adapt the service model in response to the needs of patients, clinicians and health services, often going through several iterations before establishing a suitable model.
  - *Economics* referred to the need for the service to offer value that was transparent, in terms of cost or time savings, with comparable clinical benefits to face-to-face services.
  - *Efficiency* related to the development of procedures and processes. Successful and sustainable services did not always have high activity levels, but needed to be efficient with processes.
  - *Equipment* related to consideration of infrastructure. Services did not require expensive equipment; many relied on low-cost alternatives. Services did however need to have processes in place to manage technical issues.
- It should be noted that these factors are not specifically related to video conferencing only, but other aspects of telehealth such as patient information that is stored and forwarded. These factors are specific to rural and remote communities.
- There is a paucity of data on the impact of video conferencing and appointment attendance, as well as the speciality areas of nephrology, haematology, pain management, medication review, or infectious disease.

## Background

Telemedicine or telehealth is an emerging area where information technology is fast being integrated into healthcare services. One aspect of telemedicine is the use of video, called video conferencing, for patient-clinician consultation. Video conferencing involves at least one of the parties not physically being present in the same room together. At Monash Health, a video conferencing program is to be established in a range of clinical areas. Therefore, the purpose of this review was to assist in informing the development a new teleconference service.

## Objectives

The objective of this review is to report on the evidence regarding efficacy, cost, sustainability and appointment attendance following the use of video for clinical consultation in the following clinical areas: diabetes, nephrology, oncology, haematology, genetics, pain management, medication review, infectious disease.

## Search strategy

Literature searches were performed in four bibliographic databases and Google (Table 1). The search strategy was based on a study known to the authors.<sup>1</sup> Titles and abstracts identified were exported to EndNote X7 (Thompson, Reuters, Carlsbad, California, USA). Papers identified were screened using inclusion and exclusion criteria established a priori. Inclusion and exclusion criteria were applied in two stages: 1) Only articles that are systematic reviews, involving human studies, and published in the last 5 years were included; and 2) Only reviews that specifically meet the population, intervention, outcome and context (Table 2). Searching and inclusion was conducted by one author (CJ), in consultation with colleagues as necessary.

**Table 1. Search strategy**

Database	Search terms	Limits
Pubmed	review OR meta-analysis OR "meta analysis" OR meta-analysis AND telehealth OR telemedicine	Reviews only, last 5 years, humans.
OVID Medline	telemedicine.mp. or TELEMEDICINE/ AND (review or "literature review" or "meta-analysis" or metaanalysis).af	Reviews only, last 5 years, humans.
Cochrane	telehealth	Nil
TRIP	telehealth	Reviews only
Google	telemedicine hospital telehealthcare OR telehealthcare OR diabetes OR nefrology OR oncology OR haematology OR genetics OR pain OR medication "infectious disease"	Nil

**Table 2. Inclusion/Exclusion criteria**

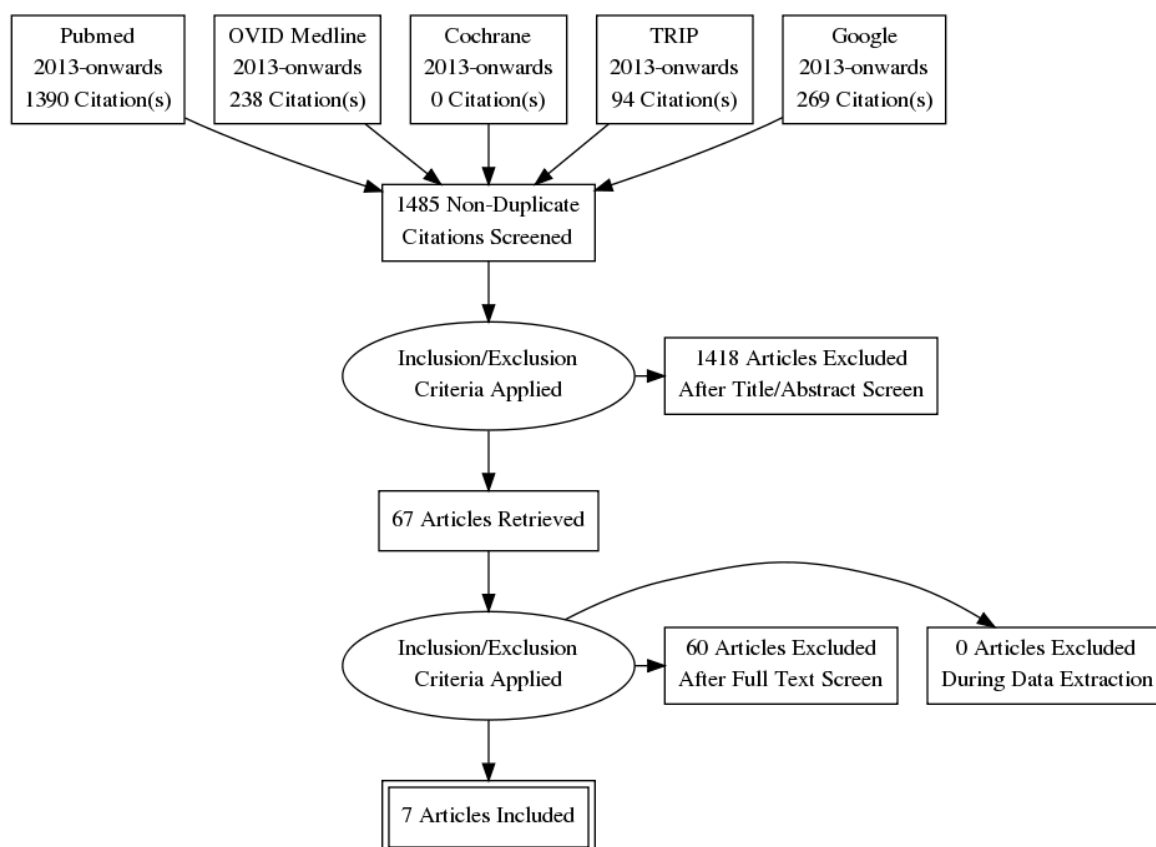
<b>Population</b>	<b>Include:</b> Adult and paediatric services. <b>Exclude:</b> Aged care.
<b>Interventions</b>	<b>Include:</b> Telemedicine video calls with patient present. <b>Exclude:</b> All other telemedicine modes (e.g. telephone, electronic or mobile).
<b>Outcomes</b>	<b>Include:</b> Efficacy, cost, sustainability, appointment attendance.

<b>Context</b>	<b>Include:</b> Diabetes, nephrology, oncology, haematology, genetics, pain management, medication review, infectious disease. <b>Exclude:</b> All other contexts (e.g. dietetics, dermatology, mental health, rheumatology, physical activity, etc.).
<b>Types of evidence</b>	<b>Include:</b> Systematic reviews. <b>Exclude:</b> Non-systematic reviews (e.g. scoping review and descriptive, or analytic studies).
<b>Limits</b>	<b>Date:</b> Last 5 years.

## Results

Overall, 1629 studies were found. After removing duplicates and applying the inclusion/exclusion criteria, 67 full-text articles were retrieved. Of these, 7 met the inclusion criteria for this study (Figure 1). One review explored the use of Skype for video conferencing.<sup>2</sup> One review explored the use of in-hospital telemedicine, including video conferencing.<sup>1</sup> With respect to patient populations, review studies focused on patients with diabetes,<sup>3</sup> Aboriginal and Torres Strait Islanders,<sup>4</sup> and patients with chronic conditions, including diabetes.<sup>6</sup> Reviews also focused on patient satisfaction,<sup>5</sup> and the success and sustainability of telehealth in remote and rural Australia.<sup>7</sup>

There were no review studies found for nephrology, haematology, pain management, medication review, or infectious disease. Nor were there any reviews that focused on appointment attendance as an outcome measure.



**Figure 1. PRISMA flowchart of included studies**

### Skype video conferencing<sup>2</sup>

One review<sup>2</sup> looked specifically at the use of Skype, a low-cost or no-cost video conferencing tool in healthcare settings. They found that the use of Skype was most prevalent in the management of chronic diseases such as cardiovascular diseases and diabetes, followed by educational and speech and language pathology applications. Most reported uses were in developed countries. In all but one case, Skype was reported by the authors to be feasible and to have benefits mostly to disease management, but also diagnosis and treatment. However, while Skype may be a pragmatic approach to providing telemedicine services, in the absence of formal studies, the clinical and economic benefits remain unclear.

Whilst the majority of studies included in this review were for patients with chronic disease, none were related to diabetes, and therefore, it was not possible to report the impact of Skype on diabetes patients.

## **In-hospital Telemedicine <sup>1</sup>**

### Medication review

No reviews were found that reported evidence around video conferencing and medication review. However, one single study included in this systematic review<sup>1</sup> contained a study that used video conferencing to manage and review medication.<sup>8</sup> An intervention by clinical video pharmacy (tele-pharmacy) services demonstrated statistically significant reductions in HbA1c and LDL-cholesterol. These results are comparable to patient results from face-to-face visits with clinical pharmacists. There were no significant changes in the number of patients attaining their HbA1c or LDL-cholesterol goals after video conference intervention.<sup>8</sup>

### Paediatrics

Patient satisfaction has been reported to be high for paediatric video conferencing, with reports of cost and time savings for patients. Patient comfort with the consultation was reported in 77% of the patient respondents. Concerns regarding privacy, comfort with the camera, and satisfaction that the specialist was comfortable with a non-face-to-face appointment were all independent predictors of satisfaction.<sup>9</sup>

Further, a single study conducted at the Shriners Hospitals in the U.S. set up a video conferencing program for patients and external healthcare providers.<sup>10</sup> In this program, a coordinator travelled to healthcare services with the video conferencing equipment and televised the consultation back to the Shriners hospital. It was reported that the coordinator was essential developing effective relationships with remote sites, providers and funding resources. These relationships were fundamental to setting the stage and gaining access to necessary networks. The coordinator had to understand the technical capabilities and roles of all the participants in the process, how to troubleshoot problems and obstacles that arose, understand and comply with ever changing regulations governing the industry, and play the role of a promoter/marketer for an innovative service.

## **Patients with Diabetes <sup>3</sup>**

One review investigated the improvement in treatment outcomes following telemedicine interventions for diabetes however, there were no findings specific to video conferencing relevant to this review as it included home-based interventions, mixed telephone and video, nurse education only.

## **Aboriginal and Torres Strait Islanders<sup>4</sup>**

Video conferencing has been used to provide medical consultations for the supervision of chemotherapy administration and for the delivery of speech rehabilitation therapy. For all video consultations patients attended a regional public hospital. During video consultation, the patient can be accompanied by family members, primary health practitioners (health workers, nurse, and medical officer) and or a traditional healer.

The benefits of social and emotional well-being from receiving care in the community, attendance of family during care, and choice for palliative patients to die in country were all reported. A reduction in patient travel and greater access to specialist care was also frequently reported in the included studies.

The perspective of Indigenous patient's and the use of telehealth reported a 75-100% preference for teleconsultations over face-to-face consultations.

Video consultations were reported to alter the way an Indigenous patient traditionally interacts with providers. Indigenous Australians reported positive interpersonal interactions and the ability to develop rapport with the consulting clinician. Good technical quality was viewed as crucial for video consultations with Indigenous patients.

No adverse outcomes are reported using video conferencing in Aboriginal and Torres Strait Islander people.

### Oncology

There were no reviews found that synthesised the evidence regarding the use of video conferencing in oncology. However, one review on telehealth and indigenous people<sup>6</sup> included a single study using video conferencing in oncology.<sup>11</sup>

Oncology video conferencing was set up in a Queensland for indigenous patients.<sup>11</sup> The service allowed family members, Indigenous health workers, nurses or local medical officers to accompany the patient at the remote site for a video conference for new referrals, reviews, monitoring of treatment, or routine follow-up. They found that patient, family members and healthcare workers all thought the service was of benefit. Further, patients reported they were able to

develop a rapport with the specialist, they preferred the service over face-to-face, the quality of the video conferences was good, and they were satisfied with the service.

## **Patient satisfaction**

One review looked at patient satisfaction and telehealth however, there was no explicit findings regarding video conferencing.<sup>5</sup> However, there were two single studies<sup>12,13</sup> in the systematic review<sup>5</sup> that explored the use of teleconferencing and patient satisfaction and they are summarised below.

### General medical<sup>12</sup>

One single study looked at the use of video conferencing in 11 medical clinics.<sup>12</sup> They used video conferencing in the consultation to communicate between the patient and an assisting nurse, and an offsite nurse or physician.

One-third of patients expressed a preference for receiving care via video conference. An additional 57% rated it as just as good as a traditional visit. Over half of patients cited shorter/no wait time as their primary motivation for using telehealth. Patients' experiences were overwhelmingly positive: 94–99 % reported being very satisfied with all attributes. When rating the quality of care they received, 95 % of all patients were very satisfied. Among all patients, 95 % were very satisfied with the technology, i.e., their ability to see and hear the practitioner and to see diagnostic images on the monitor. Finally, 95 % of all patients appreciated the convenience of the service. Nearly 100 % of patients in each group reported that they definitely or probably would use video conference personally and would recommend the service to someone else.

### Genetics<sup>13</sup>

One single study used video conferencing in the community with the patient and community site physician and a remote genetic counsellor.

The most frequently reported advantages of video conference genetic services were reducing the burden of traveling, and the convenience and ease of local services. Other patient reported advantages included informational value, efficiency, and the benefit of services in their local and familiar medical facility. The majority of participants reported no disadvantages and had no recommendations for improvement. Some reported technical challenges and that visits felt less personal.

Patient-reported satisfaction with genetic services and tele-conferencing services was high, both overall and on specific items. Most patients reported feeling comfortable with the video camera and that their privacy was respected, although some reported concerns that video conferences might increase the risk of breach of confidentiality of their health information. While the majority of patients reported having no trouble seeing or hearing the genetic counsellor patients some patients reported technical difficulties. Nonetheless, all patients reported being satisfied with genetic services.

## **Sustainability in Rural and Remote Communities<sup>7</sup>**

One review explored the factors influencing success and sustainability in rural and remote telehealth services in Australia.<sup>7</sup> There were six categories identified that were associated with success and sustainability. They were:

- *Vision* related to having a clear, realistic goal defining the purpose of the service.
- *Ownership* related to the clinical need, motivation and purposeful development of the service; success required both clinicians and management to be 'on board' and supportive of the initiative.
- *Adaptability* related to the recognition of the requirement to adapt the service model in response to the needs of patients, clinicians and health services, often going through several iterations before establishing a suitable model.
- *Economics* referred to the need for the service to offer value that was transparent, in terms of cost or time savings, with comparable clinical benefits to face-to-face services.
- *Efficiency* related to the development of procedures and processes. Successful and sustainable services did not always have high activity levels, but needed to be efficient with processes.
- *Equipment* related to consideration of infrastructure. Services did not require expensive equipment; many relied on low-cost alternatives. Services did however need to have processes in place to manage technical issues.

It should be noted that these factors are not specifically related to video conferencing only, but other aspects of telehealth such as patient information that is stored and forwarded. Furthermore, these factors are also specific to rural and remote communities.

## Grey literature

The state government of Victoria provides a website that details current telehealth projects within the numerous healthcare services. These projects can act as exemplars for service development. The link can be found here: <https://www2.health.vic.gov.au/hospitals-and-health-services/rural-health/telehealth/telehealth-projects>

## Conclusions

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Skype is a low or no-cost tool that can be used for the delivery services to patients. Video conferencing also provides a high level of satisfaction for healthcare workers, paediatric and indigenous patients. Factors that are associated with the success and sustainability of video conferencing services include vision, ownership, adaptability, economics, efficiency, and equipment. There is a paucity of data on the impact of video conferencing and appointment attendance, as well as the speciality areas of diabetes nephrology, haematology, pain management, medication review, or infectious disease.

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