

# Telehealth for multiple chronic conditions

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## Project summary

This study was a randomised controlled trial of telehealth remote monitoring for people who had two or more chronic conditions, including: diabetes, chronic obstructive pulmonary disease (COPD), chronic heart failure (CHF), hypertension and asthma. The study aimed to test the hypothesis that self-monitoring via home-based telehealth equipment can, when combined with ongoing remote monitoring of the patient's results by a nurse, reduce the incidence of hospitalisations and emergency department visits for people with multiple chronic illnesses. It also aimed to empower older individuals to take a more active role in managing their chronic illnesses.

Participants randomised to the intervention group were provided with equipment and trained to measure their vital signs (blood pressure, blood glucose levels, weight, pulse and oxygen saturation levels) on a daily basis for a period of 12 months. Readings were then transmitted via the internet to a secure website where any deviations from set parameters triggered email alerts which were reviewed by a nurse.

The intervention was evaluated by determining whether participants: showed a measureable reduction in hospital admissions, length of stay and emergency department visits; improvements in their self-assessed quality of life and confidence in self-management behaviours; whether participants and their GPs were satisfied with the service and its outcomes; and what they saw as the benefits and challenges of a telemonitoring service.

## Results

### Demographics

A total of 117 participants took part in the trial (59 telehealth group and 58 control group). The average age for the telehealth group was 74 and 71 for the control group. In the telehealth group 53% of participants were female compared to 42% in the control group. Both groups were taking a large number of prescription medications (average 11 per day) and scored an average of eight on the Charlson Co-morbidity Index indicating they were eight times more likely to die in the next year of life in comparison to a person who scores 0 on the index.

## Health service use

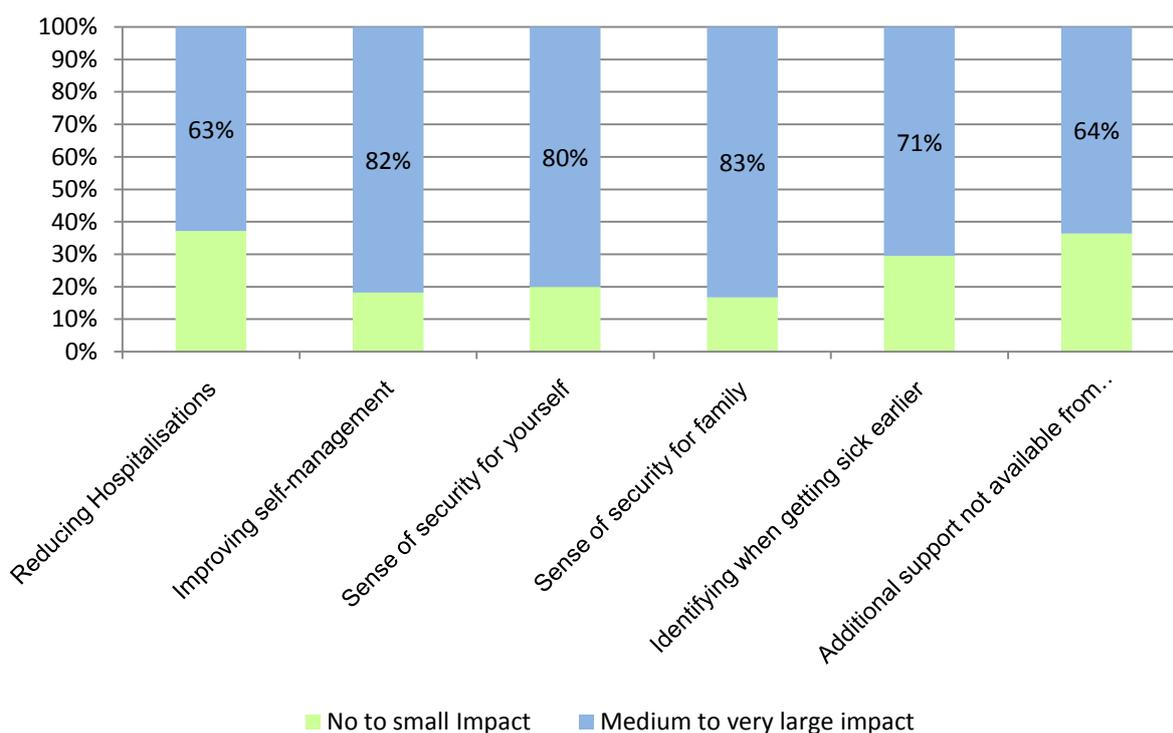
This trial has shown that for people with multiple chronic illnesses, telehealth did not result in any measurable reduction in health service use. While, the telehealth group had shorter hospital stays by an average of 1.4 days, in comparison to the control group, this difference was not found to be statistically significant. There were also no within-group differences between the number of chronic disease related hospital admissions or the length of time spent in hospital in the year prior to the study and the 12 month study period for either group.

## Health outcomes

Empowering older individuals to take a more active role in managing their chronic illness and improving health outcomes was also an important aim of the research. The results show that quality of life and self-efficacy (confidence in managing your chronic disease) were maintained in the telehealth group, whereas they significantly declined in the control group. Additionally, for individuals considered to have uncontrolled hypertension, over a third were able to show improved blood pressure control at the completion of the study. The use of telehealth in identifying and managing poorly controlled hypertension is an important finding as one of the sequelae of uncontrolled hypertension is end-organ damage resulting in heart attack, heart failure, stroke and kidney failure.

In terms of the impact of telehealth from the participant perspective the majority reported that it had made a medium to very large impact on helping them to better self-manage their chronic diseases and on providing a sense of security for themselves and their family or carer. As can be seen in Table 1 over two thirds also reported that it had had a medium to very large impact on helping them to identify when they may have been getting sick earlier and helping to recognise their own symptoms before an exacerbation.

Table 1: Participant Reported Impact of Telehealth



Using the telehealth equipment to monitor their health on a daily basis also prompted increased communication between the participant and their GP. Over 80% of participants reported that they had discussed their daily measurements with their GP, and further, half of them reported that there were medication reviews/adjustments or changes to treatment because of these discussions.

#### Use of tablet technology

This study was innovative in that it involved teaching older adults to use tablet computers to monitor their health regularly. The vast majority of participants (over 90%) were satisfied or very satisfied with the ease of use of: the tablet touch screen, the telehealth equipment used to measure their vital signs, and the time it took to enter their daily measurements.

Participants embraced the technology and only one person was withdrawn from the study because they were unable to use the tablet. Just under half (44.4%) reported using the tablet for things other than their measurements, such as: playing games, searching the internet, social networking, emailing family and friends and sending messages to the telehealth nurse.

#### Participant comments

Participants were also given the opportunity in the 12 month follow-up survey to make general comments about the trial, a selection of these are below.

*“Telehealth makes you feel a part of your treatment, with doctors they tell you what pills to take but they don’t really have time to do much more, telehealth helps you to help yourself more.”*

*“The telehealth nurse put my mind at ease when I did not know if something was normal or not.”*

*“It made me understand how the body’s workings do change day by day; it gave me more of an insight.”*

#### Telehealth nurse feedback

At the completion of the trial the telehealth nurse completed an in-depth interview which provided information on the perceived benefits of telehealth to participants, improvements for future services, potential target groups and GP involvement. The nurse reported that the program provided clients with an increased awareness of their bodies allowing them to better manage their health. The data provided reassurance justifying a visit to their GP with actual figures to show the doctor and start a discussion or review management. It also enabled one nurse to provide regular care to a group of quite unwell individuals, spread out over a considerable geographical distance.

*“It was a real pleasure to call a client and have them tell me their reading was out and that they had arranged to see the GP or had already discussed the issue with the doctor and had a plan... there was a noticeable change of approach by the participants during the course of the study, they were more in control of their health management.”*

*“Participants have told me that in the past they have gone straight to hospital when unwell;*

*they have not bothered to see the GP because either they left it too long as they hoped it would get better or the doctor wouldn't do anything anyway, whereas with encouragement to seek early intervention, most participants did see their GP or called the afterhours GP service rather than going straight to hospital for attention."*

## Impact on Policy and Practice

The practice implications of this research are specifically around the targeting of telehealth remote monitoring services, exploring participant motivation, GP access issues and the need to incorporate alternative service responses to health events.

Whilst other telehealth trials have demonstrated reductions in service use for single diagnosis models (COPD, CHF, diabetes), it would appear that there is a limit to how much impact such an intervention can have dependent on how advanced the disease is and the number of complex co-morbidities the individual has. The participants in this research were chosen because they had multiple chronic illnesses and were more likely to be frequently hospitalised and as such more likely to demonstrate cost savings related to health service use. However, these individuals were so advanced in their illness progression that deterioration in their condition was often too rapid and too serious for intervention to prevent hospitalisation.

Despite telehealth remote monitoring providing a means of identifying when a participant was getting sick, the service model did not include any response to this other than encouraging attendance to their GP. Whilst this has shown to be effective in other research for single diagnosis models, for people with multiple chronic illnesses, the inclusion of more intensive alternative care pathways, such as hospital in the home may well have enabled a reduction in hospital use.

For telehealth to be effective, participants also need to be willing to take advice and make an effort to get issues checked. However, it was reported by the telehealth nurse that despite identifying abnormal readings, some participants did not always seek advice from the GP because: they were unable to afford the visit; unable to arrange transport; or, wanted to see if the issue would resolve itself. Future telehealth services therefore would need to consider participant motivation and GP access issues to enhance success of the program.

To maximise the potential of telehealth services to provide cost savings and have the greatest impact on health outcomes, targeting the groups of participants most likely to achieve this is important. Our experience in this and previous studies has led us to conclude that telehealth self-monitoring can provide the most benefit to recently diagnosed individuals who are still learning about symptoms of exacerbation, the effects of taking/not taking their prescribed medications and how best to effectively self-manage their condition. It is also beneficial for people who have uncontrolled blood pressure and those who have recently had an acute event related to their chronic condition, especially if their care plan includes additional treatment options to supplement GP attendance.

Despite the lack of significant reductions in health services, there was evidence that remote

monitoring can have a positive impact on health outcomes. The results show that quality of life and self-efficacy were maintained in the telehealth group over the 12 month study period, whereas they significantly declined in the control group. There was also evidence of improved blood pressure control. Participants' feedback in terms of using the technology for their health measures was very positive and the tablet software also provided opportunities for social interactions. Participants developed confidence in discussing their health with their GP and use their daily measurements to support conversations about medications and treatment. These are important outcomes that could be achieved quite inexpensively in future service models. The major expense in this research was the equipment, software and internet connectivity. Increasingly, older people with chronic diseases who are most likely to benefit from remote monitoring have their own computer or tablet and access to the internet. Capitalising on that and building the service around the resources the individual already has at home, for example being able to install the monitoring app on to a range of devices, (phone, home computer, tablet) would significantly reduce the cost to future services.

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IRT Foundation directly aligns with IRT Group's mission to create age-friendly communities where older Australians can age without barriers.

We support research projects promoting a greater understanding of the ageing process and the care and wellbeing of seniors. IRT Foundation also funds community grants and educational activities.

IRT Group has committed over \$1.6 million in grants to leading Australian researchers since 2009. By making a commitment to research, advocacy and partnering with community groups and businesses, IRT Foundation will fund programs and services to change people's perceptions of older Australians and of ageing.

Our Foundation is a key part of IRT's commitment to give back \$20 million in community dividends by 2020. In doing so, we will create age-friendly communities – a society for all ages.

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