Research Note: Small Pilot of Home Telehealth in a Hospital Heart Failure Outreach Service

Jeffrey Soar¹, Lisa Capamagian², Charles Denaro³, Linda Prentice³, and Ruth Skinner-Smith²

¹University of Southern Queensland, Toowoomba, Queensland, Australia
²Tunstall Healthcare, Eagle Farm, Queensland, Australia
³Royal Brisbane and Women’s Hospital, Herston, Queensland, Australia

Abstract

Aims: To demonstrate the feasibility of the use of telehealth to better support patients and staff operating a hospital outreach heart failure (HF) service. Patients and Methods: Telehealth with interactive audio and video between the hospital and patients’ homes was used to supplement the delivery of care. The Royal Brisbane and Women’s Hospital, Tunstall Healthcare and researchers from the University of Southern Queensland developed this collaboration in 2012 to establish a telehealth pilot program to support risk assessment and services to patients in a hospital outreach heart failure service. A convenience sample consisting of 10 patients and 6 HF Service clinical staff utilised the telehealth system during 2012. Feedback from staff was gathered to assess perceptions of impacts and satisfaction. Results: Focus groups of the participating staff were held mid-project and end of project. There was consensus about a range of perceived benefits. Conclusion: Collaborations using telehealth to supplement an outreach specialty care model can be seen to have a positive impact on a patient’s care and be well-received by clinical staff.

Keywords: telehealth; heart failure

1 Aims and Introduction

Healthcare spending is growing at unsustainable rates in most OECD countries; cost pressures and challenges of access and affordability are commonly reported (Hagist & Kotlikoff 2005). Whilst treatments and outcomes for chronic diseases have improved they require extensive, long-term application and chronic diseases are increasing as causes of mortality (AIHW 2010). With Baby-boomers now entering their late-60s it is critical to incorporate smart technology-enabled solutions to facilitate the delivery of cost-effective home care and address many of the challenges of managing chronic diseases.

There is interest in available telehealth and smart home technologies but adoption remains low despite its expected value in timely and cost-effective management (Goodwin 2010). One of the reasons for this recalcitrance may be the lack of studies that have progressed beyond pilot scale; there is also criticism of the quality of the available evidence (Williams et al 2003). The better known large studies are the UK’s Whole System Demonstrator projects (Steventon et al 2012) and the USA Veterans’ Administration’s implementation (Darkins et al 2008). These reported some evidence of benefits including reductions in hospital admissions and re-admissions.
2 Background

The general failure of Telehealth projects around the world to go beyond pilots is perplexing given the evidence of high and growing levels of unmet needs of the frail elderly and people with disabilities or chronic illness. People generally prefer to remain in their own homes and delay or avoid a move to institutional care. Telehealth technology is aimed at enabling people to live more independently, access care in their own homes, improve service efficiency and allow earlier intervention to slow or reverse the progression of disease, to empower consumers and their carers, and otherwise improve their quality of life.

This project aimed to contribute to the experience of Telehealth through a pilot application within a hospital outreach heart failure service. Over 2.5% of Australians aged 55-64 years have heart failure increasing to 8.2% for those aged 75 years or over (Prentice 2010). Australians with heart failure in 2004-05 numbered 263,000. It is a major cause of hospital admissions with readmission rates of 30% and 60% at 30-day and 12 months respectively following discharge. It is associated with high levels of health-service utilisation across all settings of care as the disease progresses. Management of risk factors such as smoking, lack of exercise, obesity, excessive alcohol use and poor diet can greatly reduce the impact of heart disease. There is some evidence that cardiac rehabilitation can help decrease the risk factors (AIHW 2012).

A key in the effective treatment of chronic diseases is regular monitoring and management (AIHW 2011). HF has been in many of the international and national telehealth trials. Home-based healthcare support can assist patients to proactively manage their conditions through self-monitoring and early intervention; it can help prioritise home visits and decrease visits that are for only routine check-ups. Existing chronic illness outreach services such as those at the project hospitals lack a strong technology support for effectively prioritising patients. Monitoring systems can highlight the occurrence of abnormal readings for further investigation. When there is a large volume of abnormal readings, which is common with seriously ill patients, then it can be difficult to triage patients to identify those in most urgent need.

The monitoring requirement for HF patients and provision of services lends itself to the application of sophisticated telehealth systems. Sophisticated smart agent technology built into telehealth systems can maximize resource access and efficient utilization of available resources with better access regardless of patient location. It can assist patients in guided self-care and clinicians in decision-support.

The Royal Brisbane & Women’s Hospital (RBWH) Heart Failure Service cares for patients living with heart failure by promoting self-management, providing an action plan for worsening symptoms at home, optimising heart failure management and ensuring smooth, timely and safe transfer of health care needs. The HFS team consists of a Clinical Nurse Consultant, two clinical nurses, pharmacist, physiotherapist, exercise physiologist and a dietician. The team works closely with treating hospital physicians and allied health members, as well as the patient’s GP and other community care providers. The services provided include patient assessment and education, post-discharge telephone follow-up, home visit assessments and review, Heart Failure Multi-disciplinary Clinics, home medication titration support, outpatient exercise classes and individualised home exercise plans. The HFS typically has a case load of over 200 patients at any time for an average of 6 months post hospital discharge. The potential benefit of Telehealth to RBWH is expected to be in reduced readmissions, better targeting of home visits through the information gathered by the telehealth service which can be more accurate than self-reporting, reducing avoidable home visits through on-line monitoring, better sharing of patient information, improved provision of information for patient self-care, reduced travel for both HF clinicians and patients, and the development and testing of a model with the potential to be applied in other RBWH services as well as across Queensland Health. It is expected the Telehealth-based care model could assist staff to manage an increased number of patients.

3 Methods

The project began with establishment of the Project Team and agreement on the Project Plan. Ethics approval was obtained both from the Human Research Ethics Committee of the University of Southern Queensland and from Queensland Health through the NEAF system. The steps involved assessment of the information requirements of staff of the HFS, processes required for triage of patients, processes for referral of patients to the telehealth service, processes for removal of patients from the service, forms required and their design and content, the training requirements and schedule, the installation schedule, identification and resolution of issues, midpoint project assessment, focus group meetings, project completion, decommissioning and final assessment.

The configuration of equipment for the each patient was discussed individually. For the first patient it was decided to include Mytelemedic monitorTM, blood
pressure monitor, oximeter, scales and a glucometer. These devices were either directly connected to the telehealth base station or linked wirelessly. The Tunstall Mytelemedic telehealth monitor was designed for use by patients in their homes to help them manage their health. Each day patients were prompted to take their vital signs readings using the peripherals selected for them by the HF clinical team and answer a series of questions about their symptoms. All of this information is then transmitted to the HFS triage as well as the Tunstall telehealth response centre. If a patient’s readings are outside of the limits set for them then HFS team was prompted to contact the patient and/or schedule a home visit.

4 Results

A focus group workshop was held mid-way during the project to capture the impressions of participating staff and another was held at the conclusion of the project. The comments recorded in the focus group included:

- It was well-received by patients and staff
- One patient became stressed about using it and needed to be removed from the project
- It reduces the need to call patients by telephone as the health status of patients is readily available
- It can help prioritise which patients to call and check up on depending on the data
- Can help to adjust medication doses as a result of the up-to-date readings
- Reduced travel of patients and clinicians
- Reduced house calls
- Staff found it very helpful in monitoring their patients, especially for titration of medications in the very unstable patients.
- It has helped staff to prioritise calls and care
- Increased contact and motivation for those patients that need it
- Assisted in monitoring unstable patients
- Assisted with monitoring of medication titration effects
- Patients have found the equipment easy to use
- Useful for self-management
- Reduced the need for them to visit clinic so often – reducing travel time and expense
- Provided motivation for self-management

There were anecdotes such as:

- “Patient J, his weight went up 4 kilos in one night – so I rang him to check, he otherwise would not have been called, it demonstrates the value to early intervention; he was home by himself; he religiously does his readings but does not seek help when required – hence the telehealth helps”
- Patient A with blood sugar problems, could use to keep the hospital doctor informed; (could then use the technology to help keep him on his) medications; he is expected to be resistant to removal, would like to stay on the program for at least another month
- Patient B – emotionally attached to the unit; obese, HF problems; would like to stay on the program
- Person remote – using device with Samsung tablet
- Others – will step down (that is, will reduce their level of support from the HF Service)

- Staff perceptions:
  Appreciate emails from the Response Centre
  Used the automated heart failure and diabetic interviews that came with the system, no need to make significant changes

- Anecdotes from patients:
  Patients learnt to self-manage, so when there was an aberrant reading they would double-check or would use their own device

- Problems from staff perspective:
  Reports, preferred numbers as well as the graphs
  Better able to provide service to a larger number of patients

- Problems from patient perspective
  Easy to use
  Liked the reminder
5 Discussion

There is a high level of unmet health and social needs of older people, people with disabilities, chronic illness, and socially isolated people with the process of meeting the needs of older people or those with disability is complex (Gramstad, Storli, & Hamran, 2013). This is further complicated for those who are geographically and socially isolated. Telehealth might deliver greater benefit in isolated, remote and regional communities. Rural Australians generally have shorter lives and higher levels of illness and disease risk factors than their urban counterparts even when adjusting for the poorer health of Aboriginal and Torres Strait Islander people. They are disadvantaged in related factors of access to goods and services, educational and employment opportunities and are generally poorer. Despite incentives there are fewer medical and health services in rural and regional Australia. Rural Australia has higher levels of health risk factors, suicide, injury rates and a greater prevalence of chronic disease. The percentage of older people is three times higher than for the national population and ageing at a faster rate.

Rural decline, patterns of migration, higher levels of health risk factors and of social and economic disadvantage all impact on rural ageing. A shortage of residential aged care places in rural areas results in many older people needing to leave their home communities to access care in distant communities. Services are being withdrawn in many rural areas and NGOs report being overloaded and underfunded with Australian rural people becoming more socially isolated and alienated. Preserving and supporting rural communities is essential to our national development. From a provider perspective limited funding restricts service provision in providing satisfying contact interaction to this large and growing market of consumer’s in diverse market locations. The aged and community care sector is yet to fully embrace the wide range of technology innovations that are increasingly available for both residential and community care (Soar 2013). This in itself may be a barrier as it can be hard to know where to start, what to choose, how to implement and whether the expected benefits will be realised. Smart home technologies and other devices can facilitate social connections with some residential care facilities already using these with and for residents. Understanding the critical points within an interaction, adopting technology enabled interactions and designing scripts and roles to maximise each interaction will provide some improvement in the service transaction.

Social isolation is a major issue for older people both within residential care and in the community (Alston 2012). Social isolation is present in community settings, in institutional care, and in both urban and regional care (O’Reilly et al 2011). Telehealth systems, voice over internet interactions and service innovations have the potential to minimise the complexities of isolation, provide access to care, keep people safe, provide a social interaction and enhance the quality of life (Darkins et al 2008).

The use of online care has also been explored as a means of social communication for grandparents who wish to keep in touch with family from a distance (Bellagas et al. 2013). Older people and people with disabilities are often unaware of the potentially useful technologies available and have limited disposable incomes, making them hesitant to investigate alternatives. Limited experience with technology generally and isolation from other technology users also makes it difficult for them to understand what the technologies offer and how they can be used. It is therefore important that people are supported in understanding the range of technologies available and which technologies are best suited to their specific needs. Accessing technologies and people with this expertise can be difficult, especially for people living in regional and remote areas. Web searches can overwhelm people with options they don’t understand. It is difficult to discuss technology options with people with complex needs over the phone as it is not possible to see the difficulties they are currently experiencing or to describe the functions of the technology and how these might address their specific needs.

The use of technology enabled communication is expected to enable rural and regional people with aged health need and disabilities to live more independently remain longer in their homes, choose to delay or avoid residential care, reduce attendances at care facilities through access to services from home and to have ready access to quality information for self-care (McManus et al 2012).

There is a high level of unmet needs amongst the frail elderly and people with disabilities and the adoption of technologies that promise benefits has been disappointing. Our small-scale project confirms findings from other similar projects around the world and it is hoped will make a small contribution. The purpose for our project was to prepare for a larger-scale project following an appropriate rigorous method. The next phase will link this project with our parallel work in intelligent agent software.

6 Conclusion

The findings of the pilot project reported on in this paper demonstrated that use of telehealth in a home-based
heart failure outreach program is viable. Staff reported that patients were able to successfully use the technology as per instructions. Staff in focus groups reported many perceived benefits of the use of the telehealth system. The use of telehealth to supplement an outreach specialty care model can be seen to have a positive impact on a patient’s care and be well-received by clinical staff.

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Conflicts of Interest

None declared.

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Correspondence

Professor Jeffrey Soar
University of Southern Queensland, West St, Toowoomba, Qld, Australia +617 4631 1255 soar@usq.edu.au