Using home telehealth to empower patients to monitor and manage long term conditions

Self management of long term conditions can ease the burden on NHS resources and increase patient independence. A pilot aimed to assess the benefits of telehealth.

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This article describes a pilot telehealth project in Swansea where patients with heart failure and chronic obstructive pulmonary disease were provided with telehealth monitoring equipment. While early evaluation points to some potential economic benefits, supporting patient empowerment was a significant outcome.

INTRODUCTION

The increasing burden of long term conditions on healthcare resources provides a powerful incentive to find more efficient ways to care for patients with chronic illnesses (Paré et al, 2007). Our current healthcare system continues to focus on acute care and neglects the patient’s role in managing their own health (Bensink et al, 2006).

One way of addressing these issues is through home telehealth. This provides a means to monitor, educate and counsel patients within their own homes. Wootton et al (2006) identified that home telehealth had the potential to collect monitoring information, give patients access to their own data, improve self management and reduce the need for home visits and, ultimately, the cost of home care.

Telehealth technology incorporates home monitoring technology designed to enable people to stay in their own homes and to take greater responsibility for their own care. The main aim is to empower patients and, in doing so, prevent them from having frequent unplanned admissions, while allowing them to maintain their independence (Fururse et al, 2008; Dale et al, 2003).

DEVELOPMENT OF A TELEHEALTH SERVICE IN SWANSEA

The chronic conditions management (CCM) team at Abertawe Bro Morgannwg University Health Board set up a pilot of telehealth. The aim of the pilot was to allow patients to monitor their vital signs and become more active in managing their condition.

Funding was secured as part of a grant from the Welsh Assembly Government to purchase 11 telehealth packages that would be piloted by the CCM team.

The Genesis monitor is a small device that looks like an alarm clock and has a blood pressure cuff and pulse oximeter finger probe attached (Fig 1, overhead). Other peripheral devices, such as glucometers, INR monitors and weighing scales can also be attached. For the pilot, weighing scales were the only extra peripheral device used.

The pilot started in March 2009, and a total of 22 patients enrolled to take part until March 2010. Every day, the monitor activates at a preset time and instructs the patient to take their blood pressure, oxygen saturations and weight, as their long term condition requires. In addition, the device prompts them to answer a number of condition specific questions, which are set by the CCM nurse who tailors them to the patient’s specific needs. The questions are presented simultaneously on the screen of the device and in an audible format.

The patient can answer only “yes” or “no”, by pressing a button. While this can limit the detail, it has the advantage of making the user interface very simple as there are only two buttons. The patient can also request a visit by the CCM nurse at this point.

The device is connected to a home telephone line and sends information via this to a secure web based server. This information is then accessed via the internet by the patient’s CCM nurse who, in turn, can assess whether or not the patient needs any intervention on that particular day. Reports can be printed at the patient’s request, so they can take them to outpatient appointments in acute care.

THE PILOT STUDY

Patients diagnosed with heart failure and/or chronic obstructive pulmonary disease were included in the pilot study. Both these conditions are common in CCM caseloads, accounting for a significant amount of hospital admissions and placing the greatest demand on the service (Box 1). Patients invited to join the pilot had to meet inclusion and exclusion criteria (Box 2).

The aim was to monitor individual patients for a 12 week period, although this could be extended or shortened according to individual needs, with the pilot study running for one year. The first patient began monitoring on 2 March 2009 and 22 patients had been monitored by March 2010.

Patients were informed that the process was not an emergency response system and this was reinforced on the consent form signed by patients before the system was installed. This was because readings were checked by the CCM team 9am-5pm Monday-Friday. Patients were advised that, although they could record outside these hours, the readings would not be viewed by the CCM nurse until the next working day.
They were instructed not to rely on the machine if they felt unwell and to contact their GP or out of hours service. It is technically possible to have the readings monitored by a 24 hour call centre, which would avoid this problem, but this option was not available to the team.

EVALUATION OF PILOT
Data was collected using the following tools:

- Minnesota heart failure questionnaire, pre and post monitoring (Reigel et al, 2002);
- St George’s respiratory questionnaire (Jones, 1991) pre and post monitoring for patients with COPD;
- Patient experience questionnaires provided by the manufacturer at the end of monitoring;
- Data relating to number of CCM/surgery consultations/visits and hospital admissions before commencing and during monitoring;
- Anecdotal evidence was gathered from CCM staff, other multidisciplinary team members and patients taking part.

The pilot is being formally evaluated with Swansea University and the findings will be based on both qualitative and quantitative data. While patients consented to take part, all data was anonymised before being shared with their fellow researchers.

IMPLEMENTATION ISSUES
The telehealth team, which is part of the CCM team, encountered several problems due to equipment failure and the reluctance of staff to adapt to new practices.

Over half of the original monitors and peripheral devices supplied were faulty resulting in the company replacing all the monitors, and some of the new monitors had to be replaced as well. Faults reported included electrical faults that caused monitors to fail and which also affected some peripheral devices. Failure of the monitor screen to prompt questions was noted on some of the devices, and some did not produce the audible versions of the questions.

A major obstacle to implementation occurred when the original devices were withdrawn for upgrading and staff already trained in using these required retraining. Technical problems included an apparent incompatibility of the device with some telephone exchanges and a delay when an anticipated need to provide ADSL filters for patients’ homes where broadband had been installed was identified. This led to gaps in the monitoring of some patients and others refusing to have the monitors reinstalled in case further problems occurred.

At first, there was some reluctance within the team to refer patients due to fear of increased workload and difficulty in identifying suitable patients. Initially, staff were given basic training only, so found it difficult to anticipate the benefits for patients and felt that the software appeared complicated. Once staff started to use the software, they found it user friendly and, after extra training was provided, their initial reluctance to refer improved.

The telehealth team have undertaken this project in addition to their original workload. Initially, the team checked the daily monitoring data but this role had to be transferred to individual case managers. This has caused a problem, as some staff forgot to check data and needed to be prompted by the telehealth team.

The telehealth system is currently being installed in patients’ homes by the telehealth team, but this is time consuming and needs to be transferred to the CCM team.

INITIAL FEEDBACK
While detailed analysis of the full range of data is under way, there are some positive early indicators.

There are signs the pilot has achieved its aim to reduce unplanned hospital admissions. A comparison of admission rates before and after installation of the telehealth equipment shows a reduction for most of the patients involved.

Similarly, there appears to have been a reduction in the number of GP consultations. In respect of visits by CCM nurses, the results are more equivocal, and visits have increased in some cases. This may reflect an improvement in the detection of early signs of deterioration and extra visits may help prevent a hospital admission.

Feedback from patients via a consumer questionnaire is positive. As Kobb et al (2008) suggest, the views of patients using telehealth systems may be of some significance and positive perceptions could have a direct impact on health and health behaviour.

Patients found that having a hotline to the health professionals made them feel more secure and less anxious. Other responses point to an increased confidence in dealing with symptoms, and greater independence.

One of the main drivers for the use of telehealth equipment is to support professionals in monitoring signs and symptoms, allowing them to intervene (Wootton et al, 2006). This assumes an almost passive patient who is interested in their own monitoring. Early on in the project, the team recognised that the patient benefits directly if involved in self monitoring. Feedback suggests that patients see positive outcomes from being made aware of their own vital signs. Being able to associate how they feel with their vital signs empowers...
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and Telecare

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REFERENCES


them to recognise early indicators of deterioration.

One patient explained how he associated the feedback on his lowering oxygen saturation with very early symptoms. He was also able to identify when his oxygen therapy was effective.

Most patients said they felt more involved in their care and more able to manage their own care during the telehealth pilot.

The ability to manage their care from home was another positive outcome identified by patients. Most said they would be more comfortable with an early discharge from hospital if they had telehealth monitoring and that being at home had other advantages. They felt that, as well as preferring their home environment, it would promote better recovery, avoid hospital acquired infections and be easier for their family and carers.

The majority of patients taking part in the pilot found the equipment easy to use and were happy with the user interface. Some patients became so confident in using the system that they were able to check their blood pressure or oxygen saturations manually on an ad hoc basis.

Suggested improvements from patients included extending the service for a longer period, and to cover weekends.

Early indications are that the pilot has been successful and is worth extending. Most respondents found the service helpful and were willing to recommend it to others. Most patients at the end of 12 weeks on telehealth monitoring did not want the system to be removed from their homes. One patient said: “Telehealth has become a part of my everyday life.” The majority of patients had become so dependent on the system that the team had to remove it gradually.

CONCLUSION

Telehealth is a relatively new idea in the management of long term conditions and there is little evidence based research to support its use. However, it is developing rapidly and information on its costs and benefits is of increasing interest to decision makers in healthcare (Hailey et al, 2002).

This view is echoed by Wootton et al (2006) who said that telemedicine systems have been proposed as a cost effective means of responding to structural problems in the health service.

This small pilot scheme has shown some evidence of positive outcomes, which may be as much psychological as economic. The feeling of security that comes with the notion that someone is “watching over me” may be significant to someone worried about their health status and can have a positive health benefit as patients feel more relaxed.

The equipment provides a form of biofeedback, whereby the patient is made aware of their own physiological readings via the readings that the machine provides. This is interesting, as being made aware of their own physiological readings on a daily basis is a relatively new experience for most of them and traditionally an area from which they are often excluded by professionals.

Patients begin to associate the biofeedback with how they are feeling at the time and become experts at understanding and then predicting their health status.

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