EVALUATION OF OUTCOMES OF A CLINICAL TRIAL OF A HOME TELECARE SYSTEM FOR THE MANAGEMENT OF CHRONIC DISEASE IN THE HOME

Branko Celler, Nigel Lovell and Jim Basilakis

Biomedical Systems Laboratory, School of Electrical Engineering and Telecommunications, University of New South Wales, Sydney, 2052, Australia

Abstract: A clinical trial of a home telecare system [1-5] for the management of chronic disease at home on 22 patients with a primary diagnosis of Congestive Heart Failure (CHF) and / or Chronic Obstructive Pulmonary Disease (COPD) has demonstrated a high level of patient and doctor satisfaction with respect to usability, functionality and effectiveness. Measurement and medications compliance was high and all patients were able to use the system daily. Although a detailed evaluation of health care outcomes and cost benefits of the clinical trial was beyond the scope of this project, individual case studies suggest that this home telecare system could have a profound impact on the active management of chronic and complex disease at home.

Keywords: Home Telecare, e-Telehealth, Chronic Disease, Biomedical Instrumentation, Evaluation

Introduction

In this paper we present a preliminary analysis of the outcomes of a clinical trial of a home telecare system described in a previous paper [6] at this conference titled “Design and implementation of a home telecare system for the management of chronic disease in the home”.

Materials and Methods

A clinical trial of the home telecare system was completed in December of 2001. The sample population was 22 patients located in the Sydney area and in Wagga Wagga, a rural centre 400km southwest of Sydney. Patients were selected as having a primary diagnosis of Congestive Heart Failure (CHF) or Chronic Obstructive Pulmonary Disease (COPD) and having been hospitalised for that condition in the previous year. A complex process of obtaining approvals from various bodies was successfully negotiated and a suite of documents including informed consent and initial, follow up and final evaluation questionnaires of both patients and their GP were developed. Twelve systems were installed first in Sydney and after a series of initial problems were resolved, another ten systems were installed in Wagga Wagga. After a period of six months the final questionnaires were administered to both patients and clinicians and the results analysed.

Results

Patient Statistics: From the 22 patients that were enrolled from both Sydney and Wagga Wagga for the trial, 13 patients had COPD as their only complaint, 5 had CHF as their only complaint while 4 patients had a diagnosis of both CHF and COPD. There was a preponderance of males participating in the trial by 14:8. The mean age of the participants was 71 years old with the oldest participant being 82 years old and the youngest 61. Most patients were compliant with their recommended program of measurements. For the 17 patients that suffered from COPD or both COPD and CHF, the patients were mainly distributed in the upper half of severity of lung disease. In the case of the five patients who were diagnosed exclusively with CHF the patients’ severity of illness varied from no symptoms to being bed–ridden as a result of their heart failure.

Patient Responses: Subjects were asked to complete a questionnaire before and after the study to gauge their views on the Home telecare system. Some responses are listed below.

- All patients (100%) found the home telecare system easy to use
- 93.8% of patients (all but one) were satisfied with the home telecare system
- 75.1% rated the home telecare system as either Very Good or Good and 18.8% Adequate
- 75% either Strongly agreed or Agreed that the home telecare system can play an important role in managing their health
- 68.8% Agreed that the home telecare system gives them more control over managing their health. 18.8% Disagreed
- 93.8% of patients used the home telecare system at least once a day
- 87.4% of patients reported few or no problems with the operation of the home telecare system
- 86.7% of patients agreed that use of the home telecare system gives them extra piece of mind
- 75.1% of patients were not concerned that the confidentiality of their health information was threatened. One patient expressed some concern and another was not sure
- 93.8% of patients wanted to continue using the home telecare system on a regular basis
Case Study
Mrs BB was a 58-year-old woman living in Wagga Wagga who had a history of multiple infective exacerbations of COPD. She had been diagnosed with severe emphysema relating to her heavy smoking history. She was enrolled into the telecare trial and automated monitoring of her lung function, temperature, heart rhythm, weight and blood pressure was conducted and reviewed regularly by her GP. Fig. 1 demonstrates the trends for key measurements performed by Mrs BB over six weeks, commencing from a date very close to her discharge from hospital. During this period of home monitoring, there was a changing trend in her measurements (increased heart rate – the raw data showing an obvious sinus tachycardia, decreasing respiratory reserve (FEV1, FVC), increased weight due to fluid retention). The GP was alerted to these results. The patient was then contacted and it was discovered that she was indeed acutely short of breath. As a result, the patient was readmitted to hospital for two days after being diagnosed with lung infection and heart failure.

Discussion and Conclusions
There was generally a high level of acceptance of the home telecare system with both patients and their general practitioners responding favourably on its ease of use, effectiveness and likely impact on improving management of the patients’ chronic disease at home.

REFERENCES

Fig. 1. The three panels depict heart rate (bpm), lung function (FEV1 and FVC in litres) and weight (kg) for the patient over a six-week period in December 2001. The steady increase in heart rate and weight with a decline in respiratory reserve demonstrates a potentially serious degeneration in the patient’s health.

GP Evaluation: Overall, 88.9% stated that they were either very satisfied or satisfied with the system. 11.1% were neutral. No one expressed dissatisfaction with the system. 88.9% of the GPs felt that the home telecare system could play an important role in the management of their patients’ health, and 11.1% were not sure. 66.7% stated that they would like to continue to use the home telecare system on a regular basis, whilst the remainder were undecided. GPs were also asked to comment on the model of care presented in this study. In responding to the statement, “I think that the Home telecare system could be better managed by a centralised monitoring service rather than by a GP.”, 11.1% strongly agreed, 22.2% agreed, 44.4% were unsure and 22.2% disagreed.

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