



South Eastern Health
and Social Care Trust



HOME
TELEHEALTH
LTD

Evaluation Report for COPD Telehealth Project

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Index

Preface	3
Acknowledgments	4
COPD in Northern Ireland	5
How SETRUST used Telehealth with COPD patients	5 - 6
The Telehealth Programme	7
The holistic service model delivered by Home Telehealth Limited	7
How the project worked	8 - 11
<ul style="list-style-type: none">▪ Referral process▪ Inclusion criteria▪ Exclusion criteria▪ Home assessment▪ Installation of Telehealth equipment▪ Monitoring of patient data▪ Patient reports	
Programme results	11 - 13
<ul style="list-style-type: none">▪ Hospital admissions▪ St Georges Questionnaire▪ Face to face visit by CRT▪ Phone calls by CRT▪ GP Visits▪ Prevented admissions	
Analysis of information gathered	13 - 14
Cost evaluation	14
Limitations	15
Conclusion	16 - 17
References	18

Preface

This Report provides an evaluation of the South Eastern Health and Social Care Trust (SETRUST) COPD Telehealth project.

The project was managed by Barbara Hanna RN, Respiratory Nurse.

The Trust partnered with Home Telehealth Limited as its Telehealth service provider.

Acknowledgements:

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COPD IN Northern Ireland

Chronic Obstructive Pulmonary Disease (COPD) is a slowly progressive disorder characterised by air flow obstruction which is largely fixed, although some impairment can be partially reversed using bronchodilators and other forms of treatment. It encapsulates the conditions: chronic bronchitis, emphysema and chronic asthma. (BTS 1997)

1. In Northern Ireland in 2005-2006, there were 25,959 people diagnosed with COPD. During the same period there were 10,886 admissions to hospital for COPD utilizing 130,632 bed days. The average length of stay was 12 days with an average cost per admission of £2,305 and a total cost of approximately £25 Million (DHSSPSNI 2006)

With the reduction in the number of beds available in Northern Ireland hospitals, there is a move to drive patients from hospital based care to home based care. One area that addresses this is the recent development of Community Respiratory Teams (CRT). The team consists of a Respiratory Nurse and Respiratory Physiotherapist. With the number of patients with COPD increasing a solution needed to be found to assist the teams in managing their case load.

The Health Minister for Northern Ireland, Mr Michael McGimpsey made an announcement in January 2008, stating that a solution to these issues could be Telehealth. Mr McGimpsey has committed to having 5,000 patients with long term conditions, such as COPD using Telehealth in their own homes by 2010.

How SETRUST used Telehealth with COPD patients

The South Eastern Trust in partnership with Home Telehealth Limited (HTL) initiated a project to monitor patients with COPD living at home using Telehealth technology. Funding secured at the end of 2006's financial year of £30,000 allowed the Trust to monitor a total of 22 patients.

This Report provides an evaluation of the SEHSCT Telehealth Project. Patients recruited to this project represented a broad cross-section of the case load for the Community Respiratory Team based at Lagan Valley Hospital in Lisburn, County Antrim.

It was decided by Dr. Stephen Tate and the CRT to monitor the patients for approximately 12 weeks and 1 patient for the length of the project which was 11 months. A total of 22 patients were recruited onto the project with 17 of them providing full evidence towards the evaluation of the project. The remaining 5 patients were not able to provide full evidence as 3 deceased during monitoring and 2 failed to complete the project.

A number of outcomes and goals have been achieved in the project and evidence suggests that Telehealth could be used as a method of reducing hospital admissions and it appears to promote patients to become better managers of their long term condition and ultimately enjoy a better quality of life.

One of the 5 patients who failed to complete, experienced difficulties with the Telehealth equipment, due to problems understanding the question and answer sessions. This patient also left the project after 8 week as he could not commit to daily monitoring due to holiday plans. If this patient had been able to stay at home, his difficulties could have been addressed using a different Telehealth monitor, which is discussed further in this document.

The other patient's blood pressure was detected to be extremely high by the monitor. He attended Accident and Emergency. His daughter felt the monitoring was too stressful for him so it was stopped after 12 days.

Compliance of the remaining 20 patients using the Telehealth technology was 100%. All of the patients found the monitors easy to use and appreciated the step by step instruction given in text and audio format. The ease in which patients used the medical devices such as blood pressure and oxygen saturation was clearly evident as patients were used to having this carried out by their health professional on a regular basis.

It is suffice to say that patients on our project stated that if they were given the choice of being cared for in a hospital setting or at home, they would prefer to be cared for in their own home environment with Telehealth as a support.

The use of Telehealth to gather vital signs and carry out question and answer sessions is very much about allowing the patient to become more involved in their own healthcare delivery in a home environment

During the Telehealth Project it was found that the use of the home monitoring systems improved patient knowledge about their COPD. This directly resulted in fewer unnecessary appointments with their GP. In essence patients themselves had become ultimately better self managers.

A number of patients on the project had difficulty with their smoking cessation plan. The first monitors used in the project were limited in the questions and education provided on a daily basis. This caused a failure in addressing this high priority issue. The 2nd phase of the project, with different technology allows the creation of specific questions and health education tips.

The Telehealth Programme

The Trust over a number of months reviewed the use of Telehealth in various pilots being run in the UK by other NHS Trusts. Telehealth is a new concept in health care. Since the Trust was the first to start such a project in Northern Ireland, the Directors decided to use the services of a Telehealth service provider rather than purchasing equipment and running its own in-house service.

The partner that was chosen to deliver the programme was Home Telehealth Limited (HTL). HTL has over 10 years experience in implementing and managing Telehealth Programmes throughout the UK and Ireland and has recently been successful in providing the technology and programme management for one of the Telehealth Whole System Demonstrators in Cornwall, England.

The service offered by HTL is a holistic service model, which meant that the Trust did not have to consider extra internal resources or financial commitment. The HTL service model allowed the Trust to know exactly how much Telehealth was going to cost to deliver to each patient for the duration of the pilot.

The holistic service model delivered by Home Telehealth Limited

The service model provided the following within the Telehealth Programme.

- Provision of Telehealth awareness sessions throughout the Trust
- Provision of training to all clinical staff involved in the project
- Programme management and implementation
- Provision and maintenance of all Telehealth equipment for the duration of the project
- Assessments of patients suitability for monitoring in their own homes
- Installation of suitable Telehealth equipment
- Training patients in the use of their equipment in their own homes
- Monitoring and reviewing of patient data by qualified Telehealth Nurses in The Belfast Telehealth Care Centre
- Telephone support with patients 7 days a week
- Escalation to clinical staff as per agreed protocols
- Patients questionnaires carried out in their home and via telephone
- Review of patients use of the technology on a regular basis via home visits and telephone calls
- Removal and sanitisation of equipment when no longer required
- Providing exit questionnaires and evaluation documents

How the Project worked

Referral Process

The CRT would identify patients from its case load under the direction of Dr Stephen Tate. (Respiratory Consultant).

These patients would have to meet the following inclusion and exclusion criteria.

Inclusion Criteria

- Must live in the Lisburn council area
- Must have a diagnosis of COPD
- Must have either one or more of the following:
 - Recent emergency or unplanned admissions to hospital for COPD
 - Required a high level of support from the Community Respiratory Team
 - Be poor self managers of their COPD
- Must consent to a monitoring period of at least 12 weeks.

Exclusion Criteria

- Be physically unable to learn the process of monitoring
- Be cognitively unable to learn the process of monitoring
- Have combative/behavioral problems
- Refuse the home monitoring service
- Did not have a landline telephone installed in their home

Home Assessment

Once patients had been identified and had consented in principle to have Telehealth, a referral was made to HTL. HTL then contacted the patient directly to make an appointment to call and carry out a home assessment. During this home assessment, patients were given a demonstration of the monitor and information about the project. The assessor also checked the homes suitability for the installation, and checked that the phone and electricity points were in the correct place. If patients consented to be enrolled on the project, then a suitable date for the installation was agreed and documentation including a consent form was completed.

Installation of Telehealth equipment

Before the installation of the monitor in the patients' home, the CRT provided HTL with a list of the patients' diagnosis, past medical history and current medication. This information along with the personal information gathered at the assessment process was logged onto the Call Handling System in the Care Centre.

A monitor was allocated to the patient and their personal monitoring information downloaded onto it. This included the following:

- Patients Name
- Monitoring start time
- Vital signs that would be recorded
- Any personal reminders
- Question and answer session

The monitor was then installed in the patients' home normally in the presence of a relative or friend. Patients were given a full demonstration of the equipment and then asked to carry out a minimum of two sessions on their own to assess their skill in using the equipment. All of the patients appeared to grasp the use of the equipment very quickly due to the text and audible instructions given by the monitor.

Monitoring of Patient Data

Each morning at a dedicated time agreed with the patient, they would record the following vitals signs.

- Pulse
- Blood pressure
- Body weight
- Oxygen saturation levels
- Temperature

Along with these recordings the patients would be asked by the monitor a selection of questions relating to their COPD. The first monitor used on the programme called the Genesis from Honeywell Hommed had a selection of questions, but unfortunately were limited in that we could only use 10 and the answers were set at yes & no.

The following is the list that we were able to use for COPD.

1. Are you experiencing more difficulty breathing compared to a normal day?
2. Have you developed a cough?
3. Have you been using you inhaler more than usual?
4. Have you had to limit your activities more than usual?
5. Are you out of any of your medications?
6. Did you need extra pillows to sleep last night?
7. Have you noticed any extra swelling in you feet or ankles?
8. Are you on a smoking cessation plan?

With these limitations Home Telehealth Limited sourced another monitor called Remote Nurse from WebVMC. The main difference in this monitor is that it is software based and along with HTL the CRT could not only access a library of over 100 questions specific to COPD but could design questions, answer sets and create health tips for individual patients. The questioning session was designed using branch logic, therefore patients only needed to answer questions that were specifically based on the preceding question.

An example of the questions used is shown below.

1	How is your breathing compared to yesterday?	Better, Same, Worse
2	Have you had to use you nebuliser more that you would on a normal day?	Yes or No
3	How much swelling is in your feet and ankles?	None, Some or Extreme
4	Have you developed a new cough?	Yes or No
5	Is this a productive cough?	Yes or No
6	What is the colour of your sputum?	Pink, White, Yellow or Green
7	Have you smoked since 9am yesterday?	Yes or No
<p>If No: Health Tip: Well done and keep up the good work</p> <p>If Yes: Do you need extra support with your quitting plan?</p>		

Note: There is no limitation to the amount of questions and Health Tips that are available or can be created.

Initially patients monitored for 5 days without limits being set. A report was provided to the CRT on these 5 days and the alert limits were set by the team.

Once vital signs and answers were gathered, this data was transmitted down the patients own phone line, dialling a free phone number to a secure server. Telehealth Nurses at HTL's Care Centre would review this data within ten minutes of transmission and triage it against limits that had been set by the CRT.

If a patients data received was within its normal limits, then no action would be taken apart from a courtesy call to the patient which occurred every few days. These calls were useful in that they helped the patient build up a relationship with the Telehealth Nurse.

If any of the data gathered, either vitals or questions fell outside the agreed limits, the Telehealth nurse would phone the patients to discuss the readings and ask further questions which had been agreed by the CRT at the start of the programme. In most cases patients were asked to rest for a period and retest to see if their vitals fell back within limits.

If the second set of results were still outside the normal limits then an escalation was made to the Community Respiratory Team via their mobile phones. This allowed the CRT to prioritise their work while on the move.

During weekends and bank holidays, these escalations would have been directed to the Lisburn Out of Hours Service, but it should be noted that during the 12 month programme only 3 out of hours escalation had to be made.

Patient Reports

Each Monday the Telehealth nurse would fax a report to the CRT showing the vitals gathered for each of the patients over the previous 7 days. These graphical and tabular reports were useful as the CRT have a meeting every Monday morning at 9am to discuss their current case load.

Programme Results

Hospital Admissions

Statistics	Total	Trend	Value
Total admissions before monitoring period	17		
Total admissions during monitoring period	15	Down	11.77%
Total bed days before monitoring	120		
Total bed days during monitoring	72	Down	40%
Average length of stay before monitoring	7.06 Days		
Average length of stay during monitoring	4.8 Days	Down	2.26 Days

We further looked at the number of A&E visits without admission.

Statistics	Total	Notes
A&E visits without admission before monitoring	7	1 Chest Pain
A&E visits without admission during monitoring	7	1 High Blood Pressure

Note: All other attendances appeared to be with COPD

St Georges Questionnaires

In order to evaluate the patients' health status before and after the monitoring programme, the St Georges questionnaire was completed at the installation and uplift stages of the monitoring programme. The following are the statistics gathered from the 19 patients who were able to complete both questionnaires.

Statistics	Total	Trend	Value
Total scores before monitoring:	349		
Total scores after monitoring:	261	Down	25%
Total number of patients with a reduction in their score:	18		
Total number of patients with an increased in their score	0		
Totals number of patients with no change in their score	1		

Note: 3 scores missing as patients were end of life.

Face to face visits made by the Community Respiratory Team

Statistics	Total	Trend	Value
Total face to face visits before the monitoring programme:	159		
Total face to face visits during the monitoring programme	120	Down	24.53%

Telephone support calls made to patients by the CRT

Statistics	Total	Trend	Value
Total phone calls before monitoring period	95		
Total phone calls during monitoring period	104	Up	8.66%

GP Visits

Statistics	Total	Trend	Value
Total GP visits before monitoring period	49		
Total GP visits during monitoring period	38	Down	22.45%
Total phone calls before monitoring period	5		
Total phone calls during monitoring period	10	Up	50%

Prevented Admissions

These figures are based upon alerts detected by TeleHealth, where a detection of an onset of infection and the timely intervention of prescribed medication for the exacerbation has reduced the need for an A & E visit and/or an admission to hospital. In total 36 have been documented.

Further Analysis of the above information

The 24.53% reduction in face to face calls by the Community Respiratory team is significant. It enabled us to increase our case-load with the confidence that these patients were being monitored and the Telehealth nurses were in contact with them.

Our 8.66% increase in telephone calls is understandable. If the patient alerted with their vital signs or questions, a phone call from ourselves was sometimes adequate as we had all the information from Telehealth to act on without having to visit.

The information was collected from the General Practitioners (GP) as to their contact with the patient before and during monitoring. We were unable to gather data on 2 of the deceased patients as their notes had been archived. Of the remaining 20 patients some of the information we received included all contact with the patient. We concentrated on the phone-call or house visit which was for their COPD. Overall there was an average of 22.45% reduction in house calls and a 50% increase in telephone calls.

An 11.77% decrease in hospital admissions is significant. Before monitoring those patients who had been in hospital accumulated 120 bed days. During monitoring 72 bed days were used. This is a 40% reduction in bed days with an average reduction of 2.26 days in length of stay.

Another significant finding was the improvement in the St. George's Respiratory Questionnaire (SGRQ). It is a disease-specific measure used to assess patients with mild to severe airway disease. It was developed by Paul Jones at St George's hospital in London in 1990 to measure impact on overall health, daily life, and perceived well-being. It has been evaluated and approved as a self-administered instrument to:

- Assess the health of specific populations at a point in time
- Monitor the health of specific populations over time
- Evaluate the efficacy and effectiveness of health care interventions such as Telehealth

All the patients completed SGRQ prior to monitoring and 19 on completion of their monitoring period. Three patients deceased during the monitoring period. One patient only monitored for 12 days and for this reason there was no improvement in his score.

Limitations of the Project

This project is limited in the extent that an allocated amount of money was made available. In discussion at the start of the project it was unanimously decided by the Respiratory Consultant and the CRT that a reasonable number of patients and also a reasonable number of weeks monitoring was essential.

The monitors used at the start of the project had the questions set. These questions were unable to be changed to suit each individual patient. Recently new monitors have been implemented by the company and can be individualised to suit the patient's needs i.e. if smoking cessation is part of the patient's requirements this can now be addressed more effectively.

Conclusion

In conclusion the patients felt empowered and there was an overall improvement in their quality of life. Some of the comments from the patients proved to us how beneficial they felt it all was. One man described the experience 'like having your GP in the room all the time.

A lady who had been reluctant to go out of her house became more confident after hr monitoring. She stated 'once I knew my numbers were good I felt reassured, more confident and able to go out'.

Another lady stated that if she could afford the service, she would be more than happy to pay for it. 'Living on my own is very hard but with this service and the help and the support from the nurses is a great reassurance'.

Other comments were 'I felt this service should be made available to everyone as I find it invaluable in managing my condition'.

'I felt that the service was fantastic and if I had the opportunity to use it again I would do so'. His wife further commented that 'this has given me a peace of mind, knowing that my husband is being very well looked after'.

The majority of the patients kept their own note books of their vital signs and appeared proud to be able to tell us them.

Another advantage of SETRUST using the HTL service is that Information goes initially to the HTL Telehealth nurses. As trained nurses they were able to interpret the vital signs. If there was a slight variation in their vital signs they telephoned the patient to establish if they had been doing anything prior to monitoring, advised them to rest and repeat their monitoring in half an hour. We were only alerted when a significant difference was noted. Due to this the patients built up a rapport with the Telehealth Nurses and overall felt they had more support.

In another pilot study currently running in Northern Ireland the Respiratory nurse has to educate the patient on how to use the equipment. Also the alerts / escalations are dealt with directly by the Respiratory Team as the company which provides the service does provide the triage system that Home Telehealth Limited provides.

It is proving time consuming as most patients are alerting daily at present and it is the responsibility of their team to look at these daily and triage themselves. This prevents them from increasing their case-load. All the patients monitored in the morning, this enabled the Telehealth Nurses to have the information before 12 noon.

This proved very important because those patients who had alerted and required our intervention were able to get treatment for their exacerbation started that day. These alerts when acted upon by the CRT and treatment started are counted as avoided admissions to hospital.

Monitoring with Home Telehealth Limited (HTL) proved very efficient for the CRT. They installed the monitors and if there were any problems it was their responsibility to fix them. Overall the quality the patients received from the company was of a high standard and we have currently secured funding to monitor more patients with COPD and other long-term conditions.

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