

### EU Random Control Trial of Home Monitoring of COPD patients

The study took place under the 'Quality of Life and Management of Living Resources Programme'. It explores the outcome of a nine month monitoring programme of seventy six patients with chronic respiratory disease taking part in a randomised trial using the telehealth <DOC@HOME®> home based patient management system. The project was part funded by the EU framework 5, 'Quality of Life and Management of Living Resources Programme'

#### Background

Telehealth has been defined to be "the use of technology and clinical protocols to remotely monitor a patient's vital signs outside of a clinical setting". More recently, new design approaches in European technology supported by the member states, has redefined this description to encompass the holistic delivery of care, the management of patients and support of carers at a distance from centres of clinical expertise. This includes the monitoring of health and wellbeing through care support regimes and promotion of social interaction with the aim to prevent avoidable decline in health status, with its associated impact on patient's quality of life and healthcare delivery resource.

#### Key objectives

The overall purpose was to make a representative evaluation of evolving remote home-based patient monitoring delivery and its associated management in the context of an ageing society, the primary stated objective being:

"determine and evaluate the impact and demand of managing the care of patients at home using current state of the art technology and to identify the means for deployment following adoption by health service providers".

The particular emphasis was the prevention of decline in health status and the reduction of the financial burden on healthcare provision.

#### Method

Seventy six patients were randomly selected to participate in a socio-economic evaluation study. Patients participating in the programme were diagnosed as having chronic respiratory disease. Qualifying patients were then randomly selected into either a control or monitored group. The patients forming the control

group were managed using existing care protocols, through outpatient visits, home visits and triage on an 'on-demand' basis. The monitored group were assessed at an outpatient clinic, issued with a 'DOCOBO HEALTHHUB™' home monitor and given a brief training on its use. They then self-monitored daily and the management team assessed them remotely. Patients and clinicians could also communicate directly by phone and had access to technical support lines.

Patients were trained to use home monitor to collect medical datasets at the time of their assessment. The home monitor allowed each patient to measure and record a range of physiological signals and other measures on a daily basis including: lead 1 ECG, blood pressure, peak flow, forced expired volume and SpO2 and a standard set of questions for assessment of signs and symptoms, life style and quality of life measures, and medication concordance. Europe's generic quality-of-life (QoL) scale (EQ5D) was also used.

The patients information was automatically transferred to a central server during the night using a standard telephone connection. Clinicians viewed the data in their office on their existing PCs through a simple WEB interface. There was no requirement to purchase additional computer hardware or software.

Regular assessment of medical status and QoL factors were used to prompt calls for face-to-face consultations or home visits by community services. Clinicians were able to send messages of advice directly to patient's home monitor via the server. Patients and clinicians could also communicate directly by phone and had access to technical support lines.

## evidence based telehealth

### Patient recruitment

At the time of recruitment baseline patient characteristics were assessed including the patient's primary condition, various severity indicators and comorbidities alongside socio-economic factors, support at home and the level of motivation to join the study.

### Record of the patient's progress

At the interim clinical visits - clinical measurements, an assessment of patient's knowledge and skills, use of other health or social services since the last visit were assessed followed by consideration whether to continue the service after patient or staff comment.

At the last clinical visit - This followed the practice of the interim review with the additional assessment and re-view of factors influencing any future decisions to continue with the service for this patient.

### Post study reviews

Clinician—This determined perceptions on equipment, time, changes in personal style and or performance and general comments.

Patient—This assessed the ease of learning and using the equipment and service, the time involved and general comments.

### Clinical site quality audit

This was carried out including the record of local site activities by an external auditor that considered staff and roles involved in service delivery, handling of special events and circumstances.

### Summary of Outcomes

A significant reduction in the number and duration of hospital admissions was accompanied by a clear clinical improvement in the patients being monitored and a reduction of demand on resource.

In contrast the control group demonstrated an increase in the presentation of symptoms, the number of hospital admissions and impact on available resource.

Thirty four (90%) of patients reported that they would routinely use the DOC@HOME system for their care management.

	Control Group	Monitored Group
Symptoms	+3.8%	-12.6%
Anxiety	+7.3%	-14.5%
Impact	+9.4%	-6.2%

Learning to use the system												
Difficult		10										
Very easy to use											21	
0	2	4	6	8	10	12	14	16	18	20	22	

Difficulties in using the system												
Yes												
Occasionally												
None or rare											19	
0	2	4	6	8	10	12	14	16	18	20	22	

Perceived level of support												
same												
More supported							13					
Much more supported							12					
0	2	4	6	8	10	12	14	16	18	20	22	

### Conclusion

*“The group of patients that used the remote monitoring system correctly, presented reduction in the number and duration of hospital admissions accompanied by a significant clinical improvement. We conclude that home tele-monitoring brings a positive contribution for the management of these patients in the community.”*

Dr Manuela Zamith

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