Insufficient evidence of benefit: a systematic review of home telemonitoring for COPD

Bolton CE, Waters CS, Peirce S, Elwyn G, Engineering and Physical Sciences Research Council (EPSRC) and Medical Research Council (MRC) Grand Challenge Team

CRD summary
This generally well-conducted review concluded that the benefits of home telemonitoring for patients with chronic obstructive pulmonary disease were not yet proven. The authors’ conclusions reflect the limitations of the evidence presented and seem reliable.

Authors’ objectives
To evaluate the evidence for the clinical and economic benefits of home telemonitoring interventions for patients with chronic obstructive pulmonary disease (COPD).

Searching
The authors searched nine bibliographic databases (which included MEDLINE, EMBASE and CINAHL) and 11 telemedicine websites (listed) to July 2009. Search terms were not reported in the paper. No language restrictions were applied. Contents of relevant journals (not specified) and reference lists of retrieved articles were screened for additional studies. Authors of included studies were contacted to identify in-press and recently published articles.

Study selection
Randomised and non-randomised controlled trials and uncontrolled studies of telemonitoring interventions for adults with COPD were eligible for the review. All economic and clinically related outcomes were considered. Interventions had to meet a definition of telemonitoring reported in the paper.

Most included studies recruited patients following a hospital admission for COPD exacerbation or from secondary care clinics. Two studies specifically recruited patients who were on long-term oxygen therapy or home ventilation. Mean participant age ranged from 61 to 73 years. Telemonitoring interventions measured between one and three parameters; a symptom report was the only item included in all interventions. Frequency of monitoring ranged from daily to twice weekly. Most interventions included an educational component. The comparator, where applicable, was usual care.

Two reviewers independently selected studies for the review; disagreements were resolved by consensus.

Assessment of study quality
One reviewer assessed quality (risk of bias) using the Cochrane Collaboration criteria. The assessment was checked by a second reviewer. Disagreements were resolved by consensus.

Data extraction
Data on interventions and outcomes were extracted by one reviewer and checked by a second. Disagreements were resolved by consensus.

Methods of synthesis
A narrative synthesis was presented. Differences between studies were evident from tables.

Results of the review
Two randomised trials (139 participants), two non-randomised controlled studies (144 participants) and two uncontrolled studies (37 participants) were included. All the studies had methodological and/or reporting limitations. Only one of the studies reported a power calculation. Follow-up ranged from three to 12 months.

Four out of six studies reported a reduction in COPD exacerbations with telemonitoring. In two studies the difference was statistically significant. One of two studies that reported on quality of life found a significant improvement with telemonitoring. All six studies reported on hospital admissions and four found statistically significant reductions associated with telemonitoring.
Cost information
Two studies conducted cost-minimisation analyses and reported savings of 15% and 50% per patient associated with telemonitoring. Two other studies analysed direct costs and one reported savings. Where savings were found they were attributed primarily to reductions in hospital admission.

Authors' conclusions
Given the risk of bias in the design and the small scale of the included studies, the benefit of telemonitoring for COPD was not yet proven.

CRD commentary
The review question and inclusion criteria were clear. The search covered a wide range of sources, although unpublished studies were not sought so publication bias was possible. Search terms were not reported so the quality of the search was unclear. Measures were taken to reduce risks of errors and bias affecting the review process. Relevant details of included studies were reported. Study quality was assessed and showed that most studies were at high risk of bias. Most studies did not report a power calculation and so may have been too small to detect differences between telemonitoring and usual care.

A narrative synthesis was appropriate in view of the differences between the included studies, although the vote-counting approach used did not take account of differences in study quality. The authors noted that four of the included studies included an educational component which could have accounted for some of the effects attributed to telemonitoring.

This was a generally well-conducted review. The authors' conclusions reflect the limitations of the evidence presented and seem reliable.

Implications of the review for practice and research
Practice: The authors did not state any implications for practice.

Research: The authors stated that future trials of telemonitoring in COPD should have rigorous design, clear definitions of intervention and outcomes and should include economic analyses.

Funding
Engineering and Physical Sciences Research Council/Medical Research Council.

Bibliographic details

PubMedID
20846317

DOI
10.1111/j.1365-2753.2010.01536.x

Original Paper URL

Indexing Status
Subject indexing assigned by NLM

MeSH
Home Care Services /organization & administration; Humans; Monitoring, Ambulatory /methods; Outcome Assessment (Health Care); Pulmonary Disease, Chronic Obstructive /therapy; Telemedicine /organization & administration
AccessionNumber
12011007168

Date bibliographic record published
09/03/2012

Date abstract record published
23/06/2012

Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.