Comparing the costs of home telemonitoring and usual care of chronic obstructive pulmonary disease patients: a randomized controlled trial


Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

CRD summary
The objective was to assess the effects of home remote monitoring on the use of health care services by patients with severe chronic obstructive pulmonary disease. The authors concluded that their results were positive, but further research was needed. The costing was appropriately conducted and well reported, but the analysis should be considered a cost analysis rather than a cost-minimisation analysis, as suggested by the authors. The assumption of clinical equivalence was not supported.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The objective was to assess the effects of home remote monitoring on the use of health care services by patients with severe chronic obstructive pulmonary disease (COPD).

Interventions
Home remote monitoring (telemonitoring) comprised a touch screen with an integrated modem, on which a disease management and monitoring protocol was installed. There were also printed copies of learning materials on how to manage COPD. Each patient was instructed on the use of the equipment during their initial meeting with their case manager. Patients were responsible for sending daily information on their symptoms and medication consumption. Patient data were monitored by case managers, and automated warnings were issued by the device when the data were outside preset parameters. This allowed quick responses, with pre-programmed advice and follow-up from the case manager.

The comparator was home COPD management, provided by the regional home care service.

Location/setting
Canada/social care.

Methods
Analytical approach:
The economic analysis was conducted alongside a randomised controlled trial, in the Montreal area, coordinated by the Maisonneuve-Rosemont Hospital. The average follow-up was 365 days before intervention, 178 days of intervention, and 105 days after intervention. The authors stated that the analysis was conducted from a health systems perspective.

Effectiveness data:
The data were from the trial: 120 patients were included in the final analysis. Patients were recruited, matched into pairs, and each pair was randomised. Patients were observed before the intervention was introduced, while the device was present, and after it was removed. The intention of the trial was not to measure effectiveness, but resource consumption. Several of the resource categories could be considered to be proxies for health status, such as emergency room visits, hospitalisations and home visits by nurses. Patient satisfaction with the telemedicine device was recorded; satisfaction with usual care was not.

Monetary benefit and utility valuations:
Measure of benefit:
The health benefits were assumed to be equal for both interventions.

Cost data:
The resource use and costs for emergency room visits, hospitalisations, and home visits by nurses and respiratory therapists were recorded. To allow comparison with one year before implementation, the data from after intervention were adjusted from 105 days to 187 days (one year after implementation). The numbers of emergency room visits and hospital stays were reported with minima, maxima, means and standard deviations. Home visits were reported as the total number and their length in minutes. Hospital and home visits were valued using local wages and individual patient data. The costs were included for the equipment and labour specifically for the intervention. The equipment costs were negotiated prices from the device supplier, amortised over three years. All costs were reported in Canadian dollars (CAD).

Analysis of uncertainty:
The cost differences between before and after implementation, for each intervention, were assessed for statistical significance using Student's t-tests.

Results
The costs for the intervention group were CAD 470,312 before implementation, compared with CAD 619,602 during and after implementation; a saving of 38% or CAD 4,818 per patient. For the control group, there was a saving of 24% or CAD 3,205 per person. This equated to a net benefit of 14% in favour of the intervention.

The primary source of cost savings was reduced hospitalisations, representing an aggregate CAD 438,990 saving for the intervention group, and CAD 185,626 for the usual care group. The costs for emergency room visits were reduced by CAD 43,309 for the intervention group, and CAD 16,000 for the usual care group.

Patient satisfaction was reported as being high for the telemedicine arm. Satisfaction was not reported for the usual care arm.

Authors' conclusions
The authors concluded that their results were positive, but further research was needed.

CRD commentary
Interventions:
The telemedicine intervention was well described, but there were few details on the usual home care comparator. It was not clear if the usual home care in Montreal was similar to that in other settings. The limits the generalisability of the findings.

Effectiveness/benefits:
The focus of the study was resource use differences. The authors acknowledged that the interventions might have differed in effectiveness, and a study assessing the effects of home telemonitoring on patient quality of life, medication adherence, exacerbations, and other clinical outcomes was needed. Some of the outcomes, such as emergency room visits, hospitalisation and length of stay could be considered to be proxy health outcomes; the differences in these outcomes could translate into different health benefits for the patients. This analysis did not capture any of these, due to its focus on resource use.

Costs:
The costs were from appropriate sources, with details of resource use for several categories. This detail in resource use will allow cost comparisons with alternative settings. Overall, the cost reporting was very good, but the price year was not reported, which limits the ability to compare these results with those of other studies.

Analysis and results:
The authors suggested that they used a cost-minimisation approach, but no evidence of equivalent effectiveness was
presented, and the findings suggested that there were differences. The analysis would be better described as a cost analysis. The cost results were not compared for statistically significant differences across interventions at any time point. To determine if the intervention was cost-effective, the important comparison was the difference between the interventions. It appears that the intervention was less costly, but this was not statistically assessed.

Concluding remarks:
The costing was appropriately conducted and well reported, but the analysis should be considered to be a cost analysis rather than a cost-minimisation analysis. The assumption of clinical equivalence was not supported.

Funding
Supported by the Ministere de la Sante et des Services Sociaux du Quebec, Canada.

Bibliographic details

DOI
10.1016/j.eurtel.2013.05.001

Indexing Status
Subject indexing assigned by CRD

MeSH
Humans; Pulmonary Disease, Chronic Obstructive; Remote Sensing Technology; Telemedicine

AccessionNumber
22013041681

Date bibliographic record published
29/10/2013

Date abstract record published
24/04/2014