Outcomes of the Kaiser Permanente tele-home health research project


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.

Health technology
Remote video technology in the home health care setting (Tele-Home Health) in patients newly diagnosed as having either congestive heart failure, chronic obstructive pulmonary disease, cerebral vascular accident, cancer, diabetes, secondary diagnoses of anxiety and those needing wound care. Patients in the intervention group received video visits in addition to in person and telephone visits. The video equipment gave patients access to a home health nurse 24 hours a day. After normal working hours these patients had access to the on-call home health nurse by having the Home Health Department contact the patients using the remote video equipment. This process allowed immediate in-depth assessment and triage without patients having to leave home. The video system included peripheral equipment for assessing cardiopulmonary status.

Type of intervention
Supportive care.

Economic study type
Cost-effectiveness analysis.

Study population
Patients newly diagnosed as having congestive heart failure, chronic obstructive pulmonary disease, cerebral vascular accident, cancer, diabetes, secondary diagnoses of anxiety, or those needing wound care. Furthermore, the eligible patients were required to have a plan of care for 4 or more weeks and a projected need for 2 or more visits per week. Patients were assessed to assure that they could operate the video system, and the home had to be a safe environment for the technology.

Setting
Home health department in a large health maintenance organisation and community. The economic analysis was carried out in Sacramento, California, USA.

Dates to which data relate
Effectiveness and resource use data corresponded to the period between May 1996 and October 1997. The price year was not explicitly specified.

Source of effectiveness data
The evidence for the final outcomes was based on a single study.

Link between effectiveness and cost data
Costing was performed prospectively on the same patient sample as that used in the effectiveness analysis.
Study sample
Power calculations were not used to determine the sample size. Eligible patients were randomly assigned to either the intervention group (access to a remote video system plus the routine home health care) \((n=102)\) with a mean (SD) age of 71 (12.91) years or to the control group (access to the routine home health care) \((n=110)\) with a mean (SD) age of 69 (14.20) years. It was reported that one home was eliminated owing to an unsafe environment.

Study design
This was a quasi-experimental pilot study involving the randomised allocation of the eligible subjects (randomised controlled study), carried out in a single centre. The duration of the follow-up was until discharge from home health care. Loss to follow-up was not reported. Registered nurses and licensed vocational nurses conducted all visits during the study. Data for the analysis were collected from patient interviews and surveys, from medical record audits, and from the computer databases.

Analysis of effectiveness
The principle used in the analysis of effectiveness (intention to treat or treatment completers only) was not explicitly reported. The primary outcome measures were three quality indicators (medication compliance, knowledge of disease, and ability for self-care) and degree of patient satisfaction as reported on a 3-part scale. The scale addressed ease of use, system reliability, effectiveness and degree of provider interaction, confidence in providers' ability to assess health condition remotely, appropriate levels of care, convenience, access to care, and preferences. The three quality indicators were evaluated from abstracts of medical records and were routinely collected as part of a patient's standardised care plan. The study groups were comparable in terms of demographic characteristics, use of services during the previous year, and self-reported health status as measured by the 12-Item Short-Form Health Survey.

Effectiveness results
At discharge from home health care services, patients in the control and intervention groups did not differ in their compliance with medication regimen, knowledge about their condition, or ability to move toward self-care. More than 90% of the intervention group agreed or strongly agreed that they appreciated the care provided at the remote video visits, were confident in the assessment received, were comfortable discussing personal problems, believed they received an appropriate level of care, found the remote visit convenient, and appreciated receiving timely access to care. Both groups responded similarly regarding their satisfaction with in person caregiver visits, even though the intervention group received 194 fewer in-person visits.

Clinical conclusions
Remote video technology in the home health care setting was shown to be effective, well received by patients, and capable of maintaining quality of care. Patients seemed pleased with the equipment and the ability to access a home health care provider 24 hours a day.

Measure of benefits used in the economic analysis
No summary benefit measure was identified in the economic analysis, and only separate clinical outcomes were reported.

Direct costs
Costs were not discounted due to the short time frame of the cost analysis. Some quantities were reported separately from the costs. Cost items were reported separately. Cost analysis covered the costs of pharmacy services, laboratory, physician visits, ED visits, and inpatient treatment. Home health care costs included direct costs for payroll, benefits, travel, and cellular phone usage. In the intervention group, additional costs included capital and telecommunication charges. A time study (which was not reported in the paper) indicated that remote video visits allowed 15 to 20 video visits per day. The perspective adopted in the cost analysis was not explicitly specified. The price year was not specified.
Statistical analysis of costs
The Mann-Whitney test was used to evaluate the direct costs.

Indirect Costs
Indirect costs were not considered.

Currency
US dollars ($).

Sensitivity analysis
A sensitivity analysis was not carried out.

Estimated benefits used in the economic analysis
The reader is referred to the effectiveness results reported above.

Cost results
Although the average direct cost for home services was $1,830 in the intervention group and $1,167 in the control group, the total mean costs of care, excluding home health care costs, were $1,948 (SD $3,681) in the intervention group and $2,674 (SD $6,313) in the control group.

Synthesis of costs and benefits
A synthesis of costs and benefits was not conducted.

Authors' conclusions
Remote technology has the potential to effect cost savings when used to substitute some in person visits and can also improve access to home health care staff for patients and caregivers. This technology can thus be an asset for patients and providers.

CRD COMMENTARY - Selection of comparators
A justification was provided for the choice of the comparator (home visits and telephone contact). It was the routine home care provided in the context in question. You, as a database user, should consider whether this is a widely used health technology in your own setting.

Validity of estimate of measure of benefit
The effectiveness results are likely to have high internal validity given the randomised nature of the study design. However, no power calculations were performed to justify the sample size adopted in the study and intention to treat analysis appears not to have been conducted. The study groups were found to be comparable in terms of baseline characteristics. The study sample was highly heterogeneous which may explain the high standard deviations in the cost results. A more homogeneous sample may be more informative in terms of economic analysis.

Validity of estimate of costs
Some quantities were reported separately from the costs and adequate details of cost estimation were given. However, neither the price year nor the perspective adopted in the cost analysis were reported. It was reported that, if depreciation expenses had been included in the cost calculations, the cost of home health care services in the 2 groups would not
differ materially and the reduction in expense would be closer to $900 per patient. The effects of different types of
contacts on indirect costs were not addressed. Statistical analyses were performed on resource use components and cost
data. The cost results may not be generalisable outside the study setting.

Other issues
The authors’ conclusions appear to be justified given the uncertainties in the data. However, sensitivity analysis could
have been performed to investigate the robustness of the results to changes in the study variables. The issue of
generalisability to other countries was not addressed, although some comparisons were made with other studies. The
degree to which the study sample was representative of the study population was addressed, in that the authors noted
that the diagnostic categories chosen for the study proved to be appropriate, because the patient population identified
are high users of services and so, potentially, would benefit most from using remote video technology.

Implications of the study
As better, lower-cost products become available, new models of care using remote video access should be scientifically
evaluated for use by patients receiving home health care. Incorporating this technology into the home health care
patient's plan of care as a substitute model should further support potential cost-effectiveness. Stakeholders who are
responsible for home health care budgets agree that this type of intervention would break even within 12 months, and
its potential warrants its further study. The authors feel that technology in health care can be an asset for patients and
providers and has the potential to save costs. Therefore, this technology must be a part of continuous planning for
quality improvement.

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