A cost-effectiveness analysis within a randomised controlled trial of post-acute care of older people in a community hospital

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**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**
The authors studied a locality-based community hospital for the care of elderly people.

**Type of intervention**
Rehabilitation.

**Economic study type**
Cost-utility analysis.

**Study population**
The study population comprised elderly patients requiring rehabilitation after an acute illness for which they were admitted to hospital.

**Setting**
The setting was secondary care. The economic study was carried out in Bradford, UK.

**Dates to which data relate**
The effectiveness and resource use data were collected between November 2000 and September 2002. The prices related to 2001/02.

**Source of effectiveness data**
The effectiveness data were derived from a single study.

**Link between effectiveness and cost data**
The costing was carried out prospectively on the same sample of patients as that used in the effectiveness study.

**Study sample**
The authors reported that full details of the clinical study are reported elsewhere (Green et al. 2005, see 'Other Publications of Related Interest' below for bibliographic details). Nevertheless, many details were summarised in the current report. Patients were eligible if they were registered with a general practitioner in the primary care trust served by the community hospital and were admitted as emergency referrals to the elderly care department in that hospital. Patients could be included in the sample only once they had become medically stable, and if they were in need of post-acute rehabilitation. There was no report that power calculations were carried out in advance of the study to assess the required number of patients to minimise the influence of chance on the results. A total of 220 patients were included in the study. Of these, 141 received care in the community-based hospital and 79 received care in the district general

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Study design
The analysis was based on a randomised controlled trial (RCT), with randomisation in a ratio of 1 patient to remain in the district general hospital to 2 patients to transfer to the community hospital. The study was based in the two centres within the single primary care trust setting. The patients were followed for 6 months and the outcomes were extrapolated to a 1-year period. The authors reported that 26 patients did not achieve their allocated rehabilitation setting and that, after 6 months' follow-up, 55 patients had died (34 assigned to the community hospital group and 21 assigned to the district general hospital group). Blinding was not possible.

Analysis of effectiveness
The analysis was conducted on an intention to treat basis. The primary health outcomes were the quality-adjusted life-years (QALYs). Utility valuations were obtained from patients using the European quality of life instrument (EuroQol EQ-5D) at baseline, 1 week after discharge, and 3 and 6 months after randomisation. The authors did not report summary statistics for the patients at baseline, although this information might have been reported in the parent study. Moreover, the authors included an adjustment for baseline factors in their analysis, suggesting that some differences were present.

Effectiveness results
At baseline, the mean QALYs were 0.41 (standard deviation, SD=0.30) for the community hospital group and 0.43 (SD=0.28) for the general hospital group.

At 1 week after discharge, the mean QALYs were 0.46 (SD=0.35) for the community hospital group and 0.44 (SD=0.36) for the general hospital group. The mean difference was 0.04 (95% confidence interval, CI: -0.06 to 0.15).

At 3 months after recruitment, the mean QALYs were 0.40 (SD=0.37) for the community hospital group and 0.36 (SD=0.36) for the general hospital group. The mean difference was 0.06 (95% CI: -0.06 to 0.18).

At 6 months after recruitment, the mean QALYs were 0.38 (SD=0.34) for the community hospital group and 0.35 (SD=0.34) for the general hospital group. The mean difference was 0.06 (95% CI: -0.05 to 0.18).

The authors also reported result for surviving patients only.

Clinical conclusions
The authors concluded "health outcomes...associated with community hospital care for older people in need of post-acute rehabilitation are similar to those of a department for the care of elderly people in a district general hospital”.

Methods used to derive estimates of effectiveness
The authors made an important assumption to support the valuation of QALYs.

Estimates of effectiveness and key assumptions
The authors assumed that there was no further change from the 6-month valuation for the remainder of the year.

Measure of benefits used in the economic analysis
The authors used QALYs as their summary measure of health benefit (see the effectiveness study above for further details).
Direct costs
The authors adopted a whole system perspective incorporating the costs of health and social care. Resource use was measured using patient questionnaires administered at 1 week after discharge and 3 and 6 months after randomisation. The questionnaires were administered by an interviewer to the patient and their carer(s). The questionnaires covered information on hospital admissions, attendances at accident and emergency, visits to the general practitioner, hospital outpatient department visits, use of out-of-hours services, contact with health or social care staff, institutional accommodation, and receipt of aids and adaptations. Assumptions were made to account for missing data and the authors explored the possibility of recall bias.

The quantities and the costs were analysed separately. The unit costs were estimated from a range of local and national sources. The costs were reported in 2001/02 prices. Discounting was not required given the relatively short time horizon, which extended to less than 1 year.

Statistical analysis of costs
Resource use was reported as the mean (with SD). When sample size permitted, the authors reported that they used t-tests to compare the groups. A non-parametric bootstrapping analysis with 50,000 replications was conducted on the incremental cost and effectiveness.

Indirect Costs
Indirect costs, in terms of wider costs to society such as economic productivity, are unlikely to be relevant to the study because of the very high average age of the patients involved. However, the cost of informal carer time was not taken into account and this might have a high economic cost. The authors acknowledged that this factor was omitted from the study and noted that carers' burdens were comparable between the patient groups, and so might have had a similar impact on the overall cost.

Currency
UK pounds sterling (€).

Sensitivity analysis
Sensitivity analyses were used to investigate the robustness of the results to the main cost-drivers. The authors investigated the impact of readmission to the hospital and the use of institutional care (which incorporated the patients' financial contributions). Cost-effectiveness acceptability curves were also calculated.

Estimated benefits used in the economic analysis
See the 'Effectiveness Results' section.

Cost results
The mean cost per patient was 7,233 (SD=5,031) for the community hospital and 7,351 (SD=6,229) for the district general hospital. The difference was 118 (95% CI: -1,639 to 1,403).

The bootstrapped mean cost was per patient was 7,243 (SD=5,026) for the community hospital and 7,375 (SD=6,225) for the district general hospital.

Synthesis of costs and benefits
The authors reported that the mean incremental cost-effectiveness ratio suggests that community-based care is slightly more effective and less costly than district general hospital care. Therefore, community hospital-based care is the dominant rehabilitation alternative. The main results were found to be robust to the changes explored in the sensitivity analyses. The cost-effectiveness acceptability curve suggested that, if decision-makers were willing to pay 10,000
(30,000) per QALY gained, then community care would be cost-effective in 51% (53%) of cases.

Authors' conclusions
"Health outcomes and costs associated with community hospital care for older people in need of post-acute rehabilitation are similar to those of a department for the care of elderly people in a district general hospital."

CRD COMMENTARY - Selection of comparators
The authors aimed to investigate the cost-effectiveness of community hospital care and compared this with district general hospital care. The comparator represented the type of care available in the authors' setting. It is likely to represent at least one of the alternatives available in other settings that the reader might face.

Validity of estimate of measure of effectiveness
The analysis was based on an RCT. Such a design aims to minimise systematic differences between the groups and so increases the internal validity of the results. Although the authors did not report a comparison of the groups at baseline, this analysis was clearly carried out as the analysis included some statistical adjustment for baseline factors. Comparisons might have been reported in the parent study. The authors were clear about their methods and gave a clear and concise summary of the study with appropriate statistical analyses.

Validity of estimate of measure of benefit
The authors used QALYs measured during the clinical study as their summary measure of health benefit. As the authors acknowledged, this non-disease specific measure enables comparisons with a wide range of health- and non health-related technologies.

Validity of estimate of costs
The authors carried out their analyses from a multi-system perspective encompassing health and social care providers. All the costs relevant to these perspectives were appropriately reported. The methods and results of the costing study were well thought out and were reported in detail, enabling the reader to gain a thorough understanding. In particular, the resource quantities were reported separately from the unit costs. In addition, the authors noted the potential for recall bias from elderly patients, took steps to measure this, and reported their results. Small differences in the results over time, or due to a change in the perspective adopted, may well influence the principle results and conclusions, as the differences between the groups observed were not statistically significant. Since the costs were incurred during less than 2 years, discounting was not relevant. The date to which the prices related was appropriately reported, which will aid any possible inflation exercises.

Other issues
The authors did not draw comparisons between their own results and those of previous studies; they noted that previous studies are scarce and have suffered from methodological weaknesses. The authors noted the limited applicability of their results, reminding readers that the results are applicable to a single function (post-acute rehabilitation for older people) and one type of community hospital. These are important considerations if a reader is looking to generalise the results. The results and conclusions were an accurate reflection of the scope of the study. Some limitations were highlighted. For example, the use of only a single-site evaluation and the very high age of the participants, some of whom had cognitive impairment that might have increased the likelihood of recall bias. Steps were taken to reduce the possibility of recall bias.

Implications of the study
The authors suggest "a community hospital service similar to the one studied may be reasonably expected to reduce pressure on a district general hospital service by releasing beds” and that "post-acute rehabilitation provided by a community hospital can be an effective model for intermediate care". There were no suggestions for further work.
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None stated.

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Other publications of related interest
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