Using cost-effectiveness analysis to compare Hospital at Home and in-patient interventions: Part 2

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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 use of Hospital at Home (HaH) for the rehabilitation of patients who had undergone primary total joint replacement (PTJR).

Type of intervention
Rehabilitation.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised adult patients who had undergone PTJR and were eligible for early discharge. Specific inclusion/exclusion criteria were no history of thromboembolic disease, insulin-controlled diabetes, severe cardiac or respiratory disease, dementia, depression, other mental health illness, access to a telephone, and being co-resident with an adult.

Setting
The setting was the community. The economic study was conducted in Birmingham, UK.

Dates to which data relate
No dates for the effectiveness or resource use data were reported. The price year was not provided.

Source of effectiveness data
The effectiveness evidence was derived from a published single study that was conducted by the authors of the present study (see Other Publications of Related Interest).

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

Study sample
The authors stated that the sample size was based on power calculations, but no details of the calculations were provided. A sample of 109 patients was selected from a pool of patients with a primary diagnosis of osteoarthritis booked for primary hip or knee replacement, using stratified sampling techniques. The mean age was 74 years (range: 64 - 86). There were 64 patients in the HaH group and 45 patients in the inpatient (comparison) group. The comparison group of patients was treated using a traditional approach. A further sample of 21 co-resident carers (11 females and 10...
males) of HaH patients was selected using stratified systematic sampling methods. It was not stated whether any of the patients were excluded from the initial study sample or refused to participate.

**Study design**
This was a prospective cohort study, which was conducted in a specialist orthopaedic centre. The authors stated that a quasi-experimental design was adopted. The patients were followed for 6 months. The outcomes were assessed at baseline (preoperatively), on the day of discharge (from the inpatient unit or HaH scheme), 6 weeks postoperatively, and 6 months following surgery. No loss to follow-up occurred. Blinding was not performed because the authors stated that each patient maintained the right to choose the type of rehabilitation intervention.

**Analysis of effectiveness**
All patients included in the initial study sample were taken into account in the effectiveness study. The primary health outcomes used in the analysis were:

- A disease-specific measure of osteoarthritis, the Westerns Ontario and McMaster arthritis index (WOMAC), which is a 24-item self-reported index that compares joint pain, stiffness and difficulties with daily activities;
- Satisfaction at the point of discharge, measured using the Hospital Patient Satisfaction Index (HPSI) which is a 21-item self-reported patient satisfaction measure;
- The incidence of complications (deep vein thrombosis, pulmonary embolism, wound infection, dislocation of hip prosthesis, and pressure ulcers); and
- The experience of informal carers, as measured through semi-structured interviews.

The study groups were not shown to have been comparable at baseline. The patients’ demographic and clinical characteristics were not provided.

**Effectiveness results**
The results of the WOMAC index suggested that only joint stiffness was significantly different between the groups. The HaH patients reported less joint stiffness than the comparison patients, (p=0.03).

Patient satisfaction was significantly better for HaH patients for 13 of the 21 items considered.

There was no statistically significant difference in the incidence of complications.

Informal carers appear to have preferred HaH as there were 107 positive comments versus 36 negative comments. Also, all but one of the carers stated that they would choose HaH as a referable option to inpatient care for their relative.

There was no difference between male and female carers in terms of help categories or the overall degree of burden or responsibility.

**Clinical conclusions**
The effectiveness study showed that, compared with the inpatient interventions, the HaH intervention was effective in improving patient and carer satisfaction and in reducing joint stiffness.

**Measure of benefits used in the economic analysis**
The health outcomes were left disaggregated and no summary benefit measure was used. The analysis was therefore classified as a cost-consequences analysis (CCA).
Direct costs
Discounting was not relevant since the costs were incurred during a short time period. The unit costs were analysed separately from the quantities of resources used. The health services included in the economic evaluation were the length of stay (LOS) in the hospital or in the HaH scheme, visits by the HaH team, community and outpatient services, and the hospital readmission rates. However, the total costs were calculated only on the basis of the mean LOS for both the HaH group and the inpatient group. The savings reported by the informal carers were also evaluated. The cost/resource boundary adopted appears to have been that of the service provider. The resource used and the costs were estimated using actual data coming from the finance department, patient tracking forms, and cross references to the patients' case notes. The dates during which the resources used or prices were collected, were not reported. No price year was given.

Statistical analysis of costs
The costs were treated deterministically.

Indirect Costs
The indirect costs were not included.

Currency
UK pounds sterling (€).

Sensitivity analysis
Sensitivity analyses were not conducted.

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

Cost results
The average estimated costs were 2,984.39 per patient episode in the comparison group and 2,332.25 per patient episode in the HaH group.

The difference in costs was 652.04 per patient.

The authors stated that if all 64 HaH patients had remained in hospital, it would have cost an extra 41,720.56 to treat them following the conventional approach.

Only one patient in the HaH group required overnight readmission to the hospital, while another three patients were seen in the outpatient department. Eleven of the 21 carers reported savings due to less travel to the hospital.

Synthesis of costs and benefits
Not relevant because a CCA was conducted. However, the authors stated that it was not necessary to combine the costs and benefits since the HAH strategy dominated the standard approach, which was both more costly and less effective.

Authors' conclusions
Compared with the standard approach of inpatient care, the Hospital at Home (HaH) intervention was effective in improving patient and carer satisfaction and in reducing joint stiffness. The costs were also reduced in the HaH group and savings were observed from the perspective of the patients' carers.
CRD COMMENTARY - Selection of comparators
The rationale for the choice of the comparator was clear. Inpatient intervention was selected because this represented the standard approach for the rehabilitation of patients after PTJR. You should decide whether it represents a valid comparator in your own setting.

Validity of estimate of measure of effectiveness
The analysis of the effectiveness used a prospective cohort-study and the authors stated that a quasi-experimental design was used. However, the patients were not allocated to the study groups by randomisation and this may have introduced some selection bias. Further, the authors did not show the baseline comparability of the study groups, and the patients' demographic and clinical characteristics were not reported. Therefore, it was unclear whether the study sample was representative of the study population. These issues tend to limit the internal validity of the analysis. The size of the sample was based on power calculations, but these were not described in the paper. The length of follow-up was reported and the instruments used to estimate the health outcomes were described in detail. The authors acknowledged that their study does not adhere to strict health economics methodology. However, they stated that the study aimed to demonstrate how nurses conduct comparisons between treatment modalities.

Validity of estimate of measure of benefit
No summary benefit measure was used in the analysis because a CCA was conducted.

Validity of estimate of costs
It appears that all the relevant categories of costs have been included in the economic analysis. The unit costs were reported separately from the quantities of resources used. A breakdown of the costs was provided, although only those costs related to the length of hospitalisation were included in the main calculation. The price year was not reported, thus making reflation exercises in other settings difficult. The time during which the resource use was collected, was not reported. The costs were treated deterministically and sensitivity analyses were not conducted. Therefore, the cost estimates were specific to the study setting.

Other issues
The authors made some comparisons of their findings with those from other studies. However, they did not address the issue of the generalisability of the study results to other settings. Sensitivity analyses were not conducted, thus the external validity of the analysis was low. The study referred to patients after PTJR and this was reflected in the conclusions of the study.

Implications of the study
The study results supported the implementation of HaH interventions for patients after PTJR for the positive impact on economic and health indicators. However, caution is required when interpreting the results of the study due to the limitations of the present analysis.

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None stated.

Bibliographic details

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Other publications of related interest

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