Targeted early rehabilitation at home after total hip and knee joint replacement: does it work?

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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 study examined two strategies of rehabilitation after total hip replacement (THR) or total knee replacement (TKR). The strategies were conventional inpatient rehabilitation in a hospital ward and the early rehabilitation at home scheme (RAHS).

Type of intervention
Rehabilitation.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised patients undergoing elective THR or TKR. All patients had advanced arthritis, most of them osteoarthritis.

Setting
The settings were the hospital and the community. The economic study was carried out in the UK.

Dates to which data relate
The effectiveness and resource use data were gathered between April 2000 and April 2004. The price year was not given.

Link between effectiveness and cost data
The costing was carried out on the same sample of patients as that used in the analysis of effectiveness. It was unclear whether it was performed prospectively or retrospectively.

Study sample
Power calculations were not performed. Over the study period, 1,034 patients underwent either THR or TKR surgery. Of these, 394 patients were eligible to be included in the RAHS group according to preoperatively defined criteria. There were 174 patients (55.2% females) undergoing THR and 220 patients (57.3% females) undergoing TKR. The mean age was 73.7 (+/- 7.5) in the THR group and 72.1 (+/- 8.4) years in the TKR group. No information about the control group was given.

Study design
This was a comparative study with an historical control group that was taken from an audit of discharge after THR or
TKR. The length of follow-up was unclear. No patients were lost to the follow-up assessment.

**Analysis of effectiveness**
The clinical end points used in the analysis were:

- the average number of days spent in hospital (length of stay, LOS),
- the number of days spent in the RAHS, and
- the number of complications and readmissions for complications in the RAHS group.

Complications were related to wound infections, wound haematoma, deep venous thrombosis, chest infection, joint dislocation, failure to cope at home and decreased mobility after discharge. All patients included in the initial study sample were considered in the analysis of effectiveness. There was no information on the comparability of patients included in the RAHS group or the historical control. The authors only reported that at baseline patients undergoing THR and TKR were comparable with respect to their clinical and demographic factors.

**Effectiveness results**
In the RAHS group, among patients undergoing THR, the mean hospital LOS was 8.21 (+/- 1.46) days (range: 5 to 13) and the time on the RAHS was 3.49 (+/- 1.69) days (range: 0 to 11).

In the historical control group, the average hospital LOS for patients undergoing THR was 14 days. It was calculated that the average number of bed-days saved with the RAHS was 5.74 (+/- 1.59) (range: 0 to 9).

In the RAHS group, among patients undergoing TKR, the mean hospital LOS was 8.17 (+/- 1.42) days (range: 5 to 15) and the time on the RAHS was 2.84 (+/- 1.37) days (range: 0 to 7).

In the historical control group, the average hospital LOS for patients undergoing TKR was 12 days. It was estimated that the average number of bed-days saved with the RAHS was 5.84 (+/- 1.39) (range: 0 to 9).

There were five complications in the TKR group, three of which required readmission. There were four complications in the THR group, two of which required readmission.

**Clinical conclusions**
The effectiveness analysis showed that the RAHS reduced hospital LOS in comparison with conventional inpatient rehabilitation. Very few complications and readmissions were observed.

**Measure of benefits used in the economic analysis**
The health outcomes were left disaggregated and no summary benefit measure was used. In effect, a cost-consequences analysis was performed.

**Direct costs**
The viewpoint of the analysis appears to have been that of a UK NHS Trust. The health services included in the study were inpatient bed days and resources used for home rehabilitation (staffing, travel expenses, equipment, and visits to general practitioners or other therapists). The unit costs and the resource quantities were not presented separately for all items. Resource use for patients in the RAHS was derived from the sample of patients included in the analysis of effectiveness, whilst that for patients in the conventional group was obtained from an earlier audit of discharge after THR or TKR. The costs were derived from the hospital finance department. Discounting was not relevant as the costs were incurred during a short time. The price year was not reported.
Statistical analysis of costs
The costs were treated deterministically.

Indirect Costs
Productivity costs were not included in the analysis.

Currency
UK pounds sterling (). 

Sensitivity analysis
The issue of uncertainty was not addressed.

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

Cost results
The expected cost-savings associated with the RAHS were 192,750 among patients undergoing THR and 149,700 among patients undergoing TKR. Thus, the combined savings due to the reduction in hospital stay were 342,450.

The additional costs incurred with the RAHS due to the implementation of the scheme, readmissions and complications were 41,326.

Therefore, the RAHS led to cost-savings of 301,124 over conventional rehabilitation for the whole sample of patients undergoing either surgery.

Synthesis of costs and benefits
A synthesis of the costs and benefits was not relevant as a cost-consequences analysis was undertaken.

Authors' conclusions
Targeted early rehabilitation led to a reduction in hospital stay without any increase in complication rates in comparison with conventional inpatient rehabilitation. The authors pointed out that the success of the rehabilitation at home scheme (RAHS) was due to robust preoperative assessment and targeted postoperative rehabilitation.

CRD COMMENTARY - Selection of comparators
The selection of the comparator (i.e. conventional inpatient care) was appropriate in that it reflected the conventional rehabilitation strategy in the authors' centre. You should decide whether they are valid comparators in your own setting.

Validity of estimate of measure of effectiveness
The effectiveness evidence came from a comparative study with a historical control group. The prospective or retrospective nature of the study was not clear, but this could have an important impact on the validity of the clinical estimates since a retrospective design usually represents a limitation of the analysis. The evidence came from a single institution, thus caution will be needed if extrapolating the results of the analysis to other medical centres. The authors provided only limited information about the sample of patients included in the control group. Demographics and other clinical characteristics were reported only for the early rehabilitation group, thus it was unclear whether the two groups were comparable. The size of the sample was not justified on the basis of statistical tests. The primary clinical outcome (i.e. LOS) represents a secondary health end point rather than the direct impact of the interventions on patient health. Details on the length of follow-up were not reported clearly. The authors noted that it would have been better to have
compared the group of selected patients with a similarly selected historical cohort. However, this was not possible because of changes in the management of these patients over time. These issues should be considered when judging the internal validity of the effectiveness analysis.

Validity of estimate of measure of benefit
No summary benefit measure was used since a cost-consequences analysis was performed.

Validity of estimate of costs
The viewpoint of the cost analysis was not stated clearly, but costs relevant to the hospital appear to have been included. These costs were derived from the hospital accounting system. A detailed breakdown of the cost items was given, and some unit costs were presented separately from the resource quantities. However, the price year was not stated, thus limiting the possibility of replicating the analysis in other time periods. Statistical analyses do not appear to have been performed and the impact of using alternative cost estimates was not evaluated.

Other issues
The authors discussed the results from other studies on the effectiveness of early discharge home. The findings from previous studies were in line with those from the current economic evaluation. The issue of the generalisability of the study results to other settings was not addressed and sensitivity analyses were not performed. Therefore, the external validity of the study was limited. In general, the main limitation of the study would appear to be related to the design of the clinical analysis, as already highlighted.

Implications of the study
The study results support the early RAHS for patients undergoing either THR or TKR.

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None stated.

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Other publications of related interest
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