The effect of full-time faculty hospitalists on the efficiency of care at a community teaching 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 health technology examined in this study was inpatient care managed by full-time faculty hospitalists. Hospitalists are physicians who specialise in inpatient medical care. The hospitalists were members of the full-time faculty in general internal medicine.

Type of intervention
Other: health care management.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised all patients who were admitted to the study hospital during the two years of the study.

Setting
The study setting was secondary care. The economic study was carried out in the USA.

Dates to which data relate
The resource and effectiveness data were collected between 1994 and 1996. The price year used was not stated.

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

Link between effectiveness and cost data
The costing was undertaken retrospectively on the same study patients as those used in the effectiveness study.

Study sample
The sample size was not determined by power calculations in the planning phase of the study. The study sample represented 25.50% of the total hospital admissions during the study year. Hospitalist physicians cared for 1,620 patients during the study year, while primary care physicians cared for 1,679 patients (from the same outpatient practice as the study group) in the year preceding the study year (comparison group 1). The latter patients (comparison group 1) formed the control group.

To account for selection bias, two additional comparison groups were formed using all patients that were referred to the study hospital by primary care private practices. Comparison group 2 comprised 3,413 patients seen during the
preceeding year of the study, while comparison group 3 comprised 3,223 patients seen during the study year. However, since the lengths of stay differed for these patients and the study patients, sub-groups of comparison groups 2 and 3 were identified from the five primary care practices with the longest length of stay. The patients in these sub-groups had similar prehospital lengths of stay to those of the study patients. These sub-groups comprised 743 patients for the historical year (comparison group 2a) and 786 patients for the study year (comparison group 3a).

**Study design**
This study was a comparative study with a historical control. The same group of physicians admitted the patients of both groups (study and historical) to the hospital. To control for selection bias, there were also concurrent comparison groups of patients treated at the same hospital for the study period and historical period. All patients in all groups were admitted to the same nursing units. The essential difference between the groups was the attendance each received. The historical group rarely saw their own primary physician. The study group was attended by the hospitalists who were present all day. Patients in the comparison groups were cared for by their own physician. The study period was one year for each group. The number of admissions, patient age, health insurance source, length of stay, discharge diagnosis, diagnosis-related group, and mortality data were collected from the clinical cost accounting system of the hospital.

**Analysis of effectiveness**
The basis of the analysis of the clinical study was treatment completers only. The primary health outcomes were length of stay, mortality rate and readmission rate at 14 and 30 days. The study and comparison groups were similar in age, type of insurance and Medicare case-mix index.

**Effectiveness results**
The median length of stay decreased from 6.01 days in the historical group to 5.01 days in the study group, (p<0.001). The median length of stay in comparison group 2 was 5.01 days. This was the same as that in the study group, but was decreased in comparison to group 3 (4.00 days), (p<0.0011). Mean results were also reported.

The median length of stay in comparison group 2a was 6.00 days. Comparison group 3a had a median length of stay of 5.00 days. The difference in length of stay between groups 2a and 3a was significant, (p=0.0022).

Both the 14- and 30-day readmission rates were lower in comparison group 1 (historical group) than in the study group, (p<0.0011 for each comparison) and were increased in comparison groups 3 and 3a. The 14-day readmission rate decreased from 9.9 to 4.64 readmissions per 100 admissions between comparison group 1 and the study group, (p<0.001). The 14-day readmission rates increased in group 3 compared with group 2 (p<0.002). There was no significant difference in readmission rate between groups 3a and 2a.

The mortality rates were similar (<4%) in all groups.

**Clinical conclusions**
The use of hospitalists was associated with a shorter length of stay and a lower readmission rate.

**Measure of benefits used in the economic analysis**
No summary benefit measure was used. A cost-consequences analysis was therefore performed.

**Direct costs**
The cost/resource boundary appears to have been that of the hospital. The cost data were acquired from a specific hospital accounting system for the two years considered in the study. The costs were calculated using a relative value unit developed for every billable patient service as the best approximation of actual hospital costs. Each unit included the labour, non-labour and overhead costs. The price year was not reported.
Statistical analysis of costs
Non-parametric tests for statistical significance were conducted for the difference in median costs.

Indirect Costs
No indirect costs were included in the cost analysis.

Currency
US dollars ($).

Sensitivity analysis
No sensitivity analysis was carried out.

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

Cost results
The median cost of care was $3,552 in the study group and $4,139 in comparison group 1, (p<0.001). The median cost of care was $3,419 in comparison group 2 and $3,691 in comparison group 3, (p<0.001). The difference in the median costs of care between groups 2a and 3a was non significant, (p>0.2).

The mean cost of care for patients cared for by hospitalists was approximately $1,000 lower per case than the cost of care for comparison patients. The overall cost difference was more than $1.5 million. The median was not significantly different.

Synthesis of costs and benefits
Not relevant as a cost-consequences analysis was conducted.

Authors' conclusions
A hospitalist programme may improve the efficiency of inpatient care. The most important effect of this programme was on the cost of care. The cost-savings were explained by the reduction in length of stay for patients whose length of stay was greater than the median length of stay for all patients. In addition, the use of hospitalists was associated with a lower readmission rate and there was no measurable change in morbidity or mortality.

CRD COMMENTARY - Selection of comparators
The choice of the comparator was justified. It represented historical practice at the hospital. 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 comparative study with a historical control. There were also comparison groups for both the historical and study groups to control for selection bias. This appears to have been an appropriate design for the hospital in question. However, the internal validity of the results with this study design is suspect. The potential for confounding is high. Comparison groups were included to try to control for some bias. However, patients admitted by private practices may be managed differently from those admitted by physicians at the hospital.

The authors reported several potentially confounding variables. For example, the different numbers of physician-covered patients in each group, the effect of the resident-covered and physicians assistant-covered services, and the non-
financial incentives in the hospitalists group. The influences of these variables were not analysed. Further, length of stay reduced in the comparison groups over time, as well as in the study group compared with the historical group. Yet the authors still concluded that the hospitalists were associated with a reduction in the length of stay. The study sample appears to have been representative of the study population. These issues indicate that a degree of caution is necessary when interpreting the results.

**Validity of estimate of measure of benefit**
The authors did not derive a summary measure of health benefit.

**Validity of estimate of costs**
All the categories of costs relevant to the hospital perspective were included in the analysis. The source of the cost data was reported, but resource consumption data were not reported. Both the median and average actual costs were compared, due to skewed data. The costs compared were incurred over more than one year and no inflation rate was applied. No price year was reported. Both of these points hinder the generalisability of the results. Non-parametric tests were performed on the cost data to investigate the statistical significance of the results. No sensitivity analysis was carried out.

**Other issues**
The authors commented on some of the limitations of their analysis, and also compared the main study results with other studies. These factors aid the internal validity of the study. The results were presented in full, and the authors addressed the generalisability of the study by specifying that the results were only valid in their own setting. These factors aid the external validity of the study. The authors' conclusions were generous compared with the quality of the evidence.

**Implications of the study**
The use of full-time faculty hospitalists with greater experience and expertise than primary care physicians may improve the efficiency of inpatient care. It could also be a potential advantage for improving hospital efficiency. However, the merits of the hospitalist programme can be determined only by studies that measure quality of care, patient satisfaction, and the cost and efficiency of care in various settings.

**Source of funding**
None stated.

**Bibliographic details**

**PubMedID**
9696727

**Other publications of related interest**


**Indexing Status**
Subject indexing assigned by NLM

**MeSH**
Case Management /standards; Continuity of Patient Care; Hospital Costs; Hospitalization /economics; Hospitals, Community; Hospitals, Teaching; Humans; Length of Stay; Medical Staff, Hospital; Patient Readmission; Patient Satisfaction; Physician's Role; Physicians, Family; Quality of Health Care; Retrospective Studies; United States

**AccessionNumber**
21999008136

**Date bibliographic record published**
31/12/2003

**Date abstract record published**
31/12/2003