Comparison of appendectomy medical expense and clinical outcome between fee for service and prospective payment system


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
Appendectomy, as performed under two different reimbursement conditions within the national health insurance system, was examined. The two reimbursement conditions were prospective payment system (PPS) and fee-for service (FFS).

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised patients undergoing appendectomy. Patients that required appendectomy and also had other diseases were excluded.

Setting
The setting was a university hospital. The economic study was conducted in Kaohsiung, Taiwan.

Dates to which data relate
The effectiveness and resource use data were gathered from April to September 1997 for the FFS group and from October 1997 to March 1998 for the T/PPS group. No price year was explicitly reported, but the prices were gathered between 1997 and 1998.

Source of effectiveness data
The effectiveness evidence was derived from a single study.

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

Study sample
Power calculations do not appear to have been performed. Of the 118 consecutive appendectomy cases identified during April to September 1997, 100 were considered "valid" and were included in the FFS group. The mean age was 30.8 (+/- 18.4) years. Of the 116 consecutive appendectomy cases identified during October 1997 to March 1998, 99 were considered "valid" and were included in the T/PPS group. The mean age was 28.8 (+/- 17) years.
Study design
This was a comparative study with a historical control. The study was carried out in a single centre, the Kaohsiung University Hospital. Cases under the FFS were identified in the 6 months prior to a change in system, while those under the PPS were identified during the 6 months following the change. The charts were reviewed retrospectively and discharged patients were interviewed by telephone about procedural issues and outcomes. The time to follow-up was not reported. Only 73 cases in each group were used for the follow-up examination. Thus, the loss to follow-up was 27 patients in the FFS group and 26 patients in the T/PPS group.

Analysis of effectiveness
Only patients who completed the follow-up evaluation were considered in the clinical outcome analysis. The primary health outcomes used in the effectiveness study were:

- the frequency of post-appendectomy pain,
- the frequency of a clear incision wound,
- the frequency of removing stitches at the hospital,
- the time to stitch removal, and
- the time to return to normal activity.

The study groups were shown to have been comparable at baseline for age only. Further demographics of the patients included in the sample were not provided.

Effectiveness results
The frequency of post-appendectomy pain was 32 out of 73 in the FFS group and 23 out of 73 in the T/PPS group; the frequency of a clear incision wound was 39 out of 44 (FFS) and 36 out of 42 (T/PPS); the frequency of stitch removal at the hospital was 57 out of 70 (FFS) and 58 out of 64 (T/PPS); the time to stitch removal was 7.7 (+/- 1.5) days in the FFS group and 7.6 (+/- 2.3) days in the T/PPS group; and the time to the resumption of normal activities was 11.2 (+/- 7.9) days in the FFS group and 12.9 (+/- 10.9) days in the T/PPS group.

None of the differences in the outcome measures reached statistical significance.

Clinical conclusions
The effectiveness study showed that there was no statistically significant difference between the two study interventions in any of the outcome measures used in the study.

Measure of benefits used in the economic analysis
No summary benefit measure was used in the economic analysis due to the lack of statistical significance between the two study interventions. Thus, a cost-minimisation analysis (CMA) was effectively conducted.

Direct costs
Discounting was not required because the costs were incurred during a short timeframe. The unit costs were not reported separately from the quantities of resources used, but the costs were grouped into six general categories. The health services included in the economic evaluation were room rate, treatment, pharmacy, examination, operation, and

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anaesthesia. The cost/resource boundary adopted was that of the third-party payer. The costs and resource use were estimated using actual data coming from the hospital charts, which were retrospectively reviewed. No price year was explicitly provided, but the costs were estimated in 1997 and 1998.

**Statistical analysis of costs**
Student's t-test and chi-squared tests were conducted to compare the estimated costs, length of stay, and operation time in the two groups.

**Indirect Costs**
The indirect costs were not included in the economic evaluation.

**Currency**
New Taiwan dollars (NT$).

**Sensitivity analysis**
Sensitivity analyses were not conducted.

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

**Cost results**
The average length of stay was 6.63 (+/- 3.21) days in the FFS group and 4.37 (+/- 1.47) days in the T/PPS group, (p<0.01).

The average operation time was 97.5 (+/- 41.6) minutes in the FFS group and 75.8 (+/- 32.3) minutes in the T/PPS group, (p<0.01).

The total costs were NT$ 34,571 (+/- 12,158) in the FFS group and NT$ 28,010 (+/- 4,724) in the T/PPS group, (p<0.01).

**Synthesis of costs and benefits**
Not relevant because a CMA was conducted.

**Authors' conclusions**
The introduction of a new prospective system in the reimbursement of appendectomy led to lower costs from the perspective of the national health insurer, without affecting the quality of the care delivered to the patients.

**CRD COMMENTARY - Selection of comparators**
The rationale for the choice of the comparator was clear. The new T/PPS was compared with FFS, which represented the standard approach used before October 1997. You should decide whether it represents a valid comparator in your own setting.

**Validity of estimate of measure of effectiveness**
The analysis of effectiveness used a comparative study with a historical control, which was carried out retrospectively on data derived from the patients' charts. Consecutive cases were selected on the basis of inclusion criteria that were
partially reported, so the study sample may have been representative of the study population. It is hard to have randomised studies on payment policy. However, it is important to provide the characteristics of the patients in each group for comparability purposes and these were not provided. Further limitations were the lack of power calculations and the fact that there was no evidence of what an appropriate sample size would have been. The effectiveness analysis was conducted on a sub-group of patients involved in the cost analysis. The reasons for the loss to follow-up were not provided.

**Validity of estimate of measure of benefit**
No summary benefit measure was used in the economic analysis due to the CMA approach adopted.

**Validity of estimate of costs**
The perspective adopted in the study was explicitly stated. It appears that all the relevant categories of costs have been reported. The source of the cost data was provided. However, the unit costs and the quantities were not reported separately. Discounting was not conducted since it was irrelevant. The cost estimates were specific to the study setting and no sensitivity analyses were conducted. However, statistical tests were performed to test the statistical significance of the differences in total costs and some resource items.

**Other issues**
The authors made several comparisons of their findings with those from other studies. They did not, however, address the issue of the generalisability of the study results to other settings. Sensitivity analyses were not conducted. Thus, the overall external validity of the analysis was low. The study referred to patients requiring appendectomy and this was reflected in the conclusions of the analysis.

**Implications of the study**
The study results suggested that the new PPS for appendectomy was successfully introduced in Taiwan in 1998. It led to a reduction in costs without affecting the health outcomes.

**Source of funding**
None stated.

**Bibliographic details**

**PubMedID**
11584430

**Indexing Status**
Subject indexing assigned by NLM

**MeSH**
Adult; Appendectomy /economics; Fee-for-Service Plans; Humans; Length of Stay; Middle Aged; Prospective Payment System

**AccessionNumber**
22001006759

**Date bibliographic record published**
31/03/2004

Date abstract record published
31/03/2004