Randomized clinical trial of the effectiveness of emergency day surgery against standard inpatient treatment

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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 day-case surgery for patients with minor and intermediate surgical emergencies was examined.

Type of intervention
Patient care management.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised all emergency cases considered suitable for day-case treatment. This included patients with superficial abscesses, acutely painful hernias and acutely thrombosed prolapsed haemorrhoids. Patients with hernias causing strangulation or small bowel obstruction were excluded.

Setting
The clinical setting was an emergency department (hospital). The economic study was performed in London, UK.

Dates to which data relate
The dates when the effectiveness and resource use data were gathered, were not reported. The price year was not reported.

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

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

Study sample
The sample size was determined using a power of 80% to detect any difference between day-case and standard inpatient care at the 5% significance level. A sample size of 92 patients was considered necessary to allow the detection of differences in the main outcome measures. This assumed that the mean stay for day-case patients was 0.5 days and the common standard deviation was 0.8 days. An initial sample of 100 patients entered the study. Six patients did not undergo surgery because of abscesses that ruptured in the intervention period (4), a failure to attend surgery (1) and departure from the ward without treatment (1). The 94 patients remaining were randomised to the two groups (47 to each group). The demographics of the two groups were not reported (only for sub-groups of patients in the day-case.
group), while all patients but one had superficial abscess.

**Study design**
This was a prospective randomised trial that was performed in a single centre. The patients allocated to the day-case group were admitted to the day-surgery unit or inpatient wards. The method of randomisation was not reported. The patients were followed up by outpatient appointment at 1 to 2 months using a standard pro forma to gather information on postoperative pain and patient satisfaction. Those who did not attend the appointments were sent a postal questionnaire based on the outpatient pro forma. A total of 14 patients in the day-case group and 16 in the inpatient group attended the outpatient appointment, while 9 patients in the day-case group and 8 in the inpatient group replied to the postal questionnaire. Data on patient satisfaction and postoperative pain were therefore available for 23 (day-case group) and 24 (inpatient group) patients, respectively.

**Analysis of effectiveness**
The primary health outcomes included in the analysis were:

- the mean and median hospital LOS;
- the median delay from first presentation to surgery;
- readmissions in 30 days;
- postoperative pain;
- duration of analgesia use;
- patient satisfaction;
- complications; and

the general practitioners' (GPs) satisfaction with the two procedures.

Effectiveness data related to hospitalisation (e.g. LOS) were available for all patients, while effectiveness data during the follow-up were for treatment completers only. Postoperative pain was measured at 24 hours, 2 to 7 days, and 8 to 14 days after surgery, using a visual analogue pain score (VAPS). The authors stated that the two groups were well matched in terms of age and case-mix, but demographics of the two groups were not reported.

**Effectiveness results**
Thirty-three of the 47 patients in the day-case group were successfully treated as day-case, while the remaining 14 patients spent a total of 19 nights in hospital (mean 0.4 nights, 95% confidence interval, CI: 0.2 - 0.6; median 0 nights, range: 0 - 3).

The 47 patients in the inpatient group spent a total of 86 nights in hospital (mean 1.8 bed-nights, 95% CI: 1.6 - 2.1; median 2 nights, range: 1 - 5).

The difference in mean stay between the two groups was statistically significant (mean difference 1.4 days, 95% CI: 1.1 - 1.7; p<0.001).

The median delay from first presentation to surgery was 1 for both groups, but the difference in range led to a statistically significant difference (day-case range: 0 - 7; inpatient range: 0 - 2; p=0.018).

A sub-group analysis in patients treated as day-cases showed that the majority of overnight stays occurred in patients allocated to the inpatient ward instead of the day-case units.
There were no readmissions at 30 days in either group.

The VAPS score was slightly lower for day-case at 24 hours and 8 to 14 days after surgery, but was slightly lower for inpatients at 2 to 7 days after surgery. None of these differences was statistically significant.

There was also no statistically significant difference in the duration of analgesia use, the incidence of minor complication, and the use of primary healthcare services.

Patient satisfaction was high in both groups, 96% in the day-case group versus 92% in the inpatient group, (p not significant).

GP satisfaction was high for both treatments, 27 out of 28 GPs for day-case and 28 out of 32 GPs for inpatient, (p not significant).

**Clinical conclusions**
The effectiveness analysis showed that the day-case surgery significantly reduced patient hospitalisation without any effect on clinical outcomes such as postoperative pain or patient satisfaction.

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

**Direct costs**
Discounting was not applied, which was appropriate given the short time horizon of the cost analysis. The unit costs and the quantities of resource use were not reported separately. The quantity/cost boundary was unclear, but it may have been that of the UK NHS. The costs related to hospitalisation (including the cost of employing a nurse coordinator for day-case surgery) were included in the analysis, but a detailed breakdown of the cost categories was not reported. Resource use was derived using actual data gathered prospectively from the same sample of patients used for the effectiveness analysis. The source of the unit costs was not reported. There was no information on when the resources used were gathered and the price year was not reported.

**Statistical analysis of costs**
Differences in the costs were analysed using an unpaired t-test.

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

**Currency**
UK pounds sterling (£).

**Sensitivity analysis**
Sensitivity analyses were not carried out.

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

**Cost results**
The mean costs per patient were 594 (standard deviation, SD=145) in the inpatient group versus 447 (SD=125) in the day-case group.

The difference in mean costs (147) was statistically significant (95% CI: 92 - 202; p<0.001).

The median cost per patient was also lower for the day-case group (413, range: 350 - 779) than for the inpatient group (561, range: 394 - 1,263).

**Synthesis of costs and benefits**
Not relevant because a cost-consequences analysis was performed.

**Authors’ conclusions**
Patients with minor or intermediate general surgical emergencies could be treated as day-case without any reduction in the patients’ clinical outcomes, and with a significant reduction in the healthcare costs.

**CRD COMMENTARY - Selection of comparators**
The rationale for the choice of the comparator was clear. The authors compared day-case surgery, which is becoming a common practice in the UK, with the standard inpatient procedure. You should decide whether they are valid comparators in your own setting.

**Validity of estimate of measure of effectiveness**
The effectiveness analysis used a randomised clinical trial, which increases the internal validity of the study. The authors stated that the two groups were matched for age and case-mix, although demographic data were not reported. Power calculations were performed to assess the sample size necessary to detect differences in the main outcome measures. However, the authors acknowledged that somewhat less than half of the patients included in the initial sample size completed the questionnaires about satisfaction with treatment and postoperative pain. Appropriate statistical analyses were performed to detect the significance in the outcome differences. Sub-group analyses were performed for the day-case group. The results for LOS were presented both as mean and median values, which appears to have been appropriate given the skew in the data. The study sample was unselected and is, therefore, likely to have been representative of the study population.

**Validity of estimate of measure of benefit**
No summary benefit measure was used in the economic analysis. The analysis was therefore categorised as a cost-consequences study.

**Validity of estimate of costs**
Few details on the cost categories included in the analysis or the source of the unit costs were given. Thus, it is difficult to estimate whether all the cost categories relevant to the study perspective were included. The perspective of the study itself was not entirely clear. The authors performed statistical analyses to assess the significance in cost differences, but no sensitivity analyses were carried out. The cost estimates were specific to the study setting. There was no information on when the resource use data were obtained. The cost results were appropriately presented as mean and median values. The price year was not reported, thus making reflation exercises in other settings difficult.

**Other issues**
The authors did not address the issue of generalisability in that there were no comparisons with other studies, no sensitivity analysis was performed, and few details on the unit costs and dates were reported. Thus, the external validity of the analysis is low. The authors presented several outcome measures and the results were not reported selectively. The authors discussed the impact of the study interventions on emergency lists in the UK.
Implications of the study
The results of this study suggested that day-case surgery is feasible and, compared with standard inpatient treatment, is likely to lead to cost-savings to the NHS. The authors stressed that the success of the project depended strongly on the presence of an experienced nurse or manager to coordinate the process.

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None stated.

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Other publications of related interest

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