Effects of a low-cost protocol on outcome and cost in a group practice setting  
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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
Cost education in conjunction with a voluntary low-cost protocol in a group practice (anaesthesia).

Type of intervention
Education programme and drug administration protocol.

Economic study type
Cost-effectiveness analysis.

Study population
Male and female patients undergoing CABG, LC or LL.

Setting
Hospital. The economic study was carried out in Wichita, KS, USA.

Dates to which data relate
The main effectiveness data were derived from a single study conducted in 1997. Resource and cost data were taken from anaesthesia, recovery room and ICU records. Neither the source year nor the price year were stated.

Source of effectiveness data
The estimates of the average time to extubation, number of days spent in intensive care unit (ICU), pain, nausea and hypertension scores and minutes in discontinuation of oxygen therapy and recovery room were derived from a single study.

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

Study sample
One hundred and thirty-five cases (73 male) performed by the anaesthesiology group (12 physicians and 10 certified registered nurse-anaesthetists) after CABG, LC or LL intervention were included in the analysis (P). These cases were matched by surgery type and surgeon to cases carried out prior to the protocol to form the retrospective control group (76 male) (R). The age of the R group was 54 (+/- 16) years and the age of the P group was 54 (+/- 18) years. Power calculations to determine the sample size were not undertaken.

Study design
This was a before-and-after intervention comparison study. The duration of the follow-up was 9 months. A follow-up survey, completed 4 months after the study, was also conducted. There was no loss to follow-up.

**Analysis of effectiveness**

The analysis of effectiveness was based on treatment completers only. The primary health outcomes were the average time to extubation, number of days spent in intensive care unit (ICU), pain, nausea and hypertension scores and minutes in discontinuation of oxygen therapy and recovery room.

**Effectiveness results**

The results for the R and P groups were:

- The time (hours) to extubation, 15 (+/- 6.6) and 12.9 (+/- 6.6);
- days in ICU, 2.34 (+/- 3.14) and 1.59 (+/- 1.27);
- minutes to discontinuation of oxygen therapy, 38.3 (+/- 22.2) and 43.4 (+/- 32.6), (LC and LL);
- minutes in recovery room, 79 (+/- 28.8) and 85 (+/- 30.6), (LC and LL);
- pain, nausea and hypertension scores (CABG), 1.78, 0.02, 0.81 and 1.62, 0.09, 0.67;
- pain, nausea and hypertension scores (LC), 0.77, 0.16, 0.05 and 0.91, 0.20, 0;
- pain, nausea and hypertension scores (LL), 0.91, 0.23 0.02 and 0.95, 0.12, 0.02.

The p-values were not given.

**Clinical conclusions**

A private practice anaesthesia group that follows a voluntary protocol has little change in clinical outcome.

**Measure of benefits used in the economic analysis**

No summary benefit measure was used in the analysis and as such the benefits were considered to be the same as the outcome measures. The economic analysis was therefore based on a cost-consequences approach.

**Direct costs**

Anaesthesia-related drug and anaesthesiologist costs were included in the analysis. The quantities were reported separately from the prices. The quantity/cost boundary adopted was the hospital. All cost data were normalised to the pharmacy costs at the start of the prospective data collection period. Discounting was not undertaken due to the short study period. The price year was not stated.

**Statistical analysis of costs**

All costs (with the exception of volatile drug costs and the induction agent costs) were corrected for non-normality by conversion into their natural logarithm for analysis but were presented as non-transformed means and standard deviations. Continuous data were analysed using one-way or two-way analysis of variance as appropriate. The Tukey method was used to correct for multiple paired comparisons. Induction drug costs were evaluated using the non-parametric Kruskal-Wallace test.

**Indirect Costs**

Not considered.
Currency
US dollars ($).

Sensitivity analysis
Not undertaken.

Estimated benefits used in the economic analysis
See effectiveness results above.

Cost results
The total costs were $118 (+/- 65) and $61 (+/- 35) for the R and P group, respectively. The recovery room costs were $1.75 (+/- 3.09) and $2.02 (+/- 5.57) for the R and P group, respectively. The total cost reduction was $56.44 ($0.27 for recovery room cost). If the cost-efficient protocol were used for all cases at the hospital, savings of up to $30 per case or $450,000 per year, would be possible.

Synthesis of costs and benefits
Costs and benefits were not combined.

Authors' conclusions
A private practice anaesthesia group that follows a voluntary protocol could significantly reduce drug costs with little change in clinical outcome.

CRD COMMENTARY - Selection of comparators
Rationale for the choice of comparator was clear. The programme of education, coupled with a low cost protocol, was introduced to determine whether costs could be reduced in comparison with the comparator of normal practice. You, as a user of this database, should consider whether these options are feasible in your own setting.

Validity of estimate of measure of benefit
Summary benefit measure was used in the analysis and the authors therefore have conducted a cost and outcome analysis. The data do not appear to have been used selectively.

Validity of estimate of costs
Unit quantities were reported separately from the prices. The costing methodology lacked some details; the price year used was not reported. However no important cost items appear to have been omitted.

Other issues
Authors' conclusions are likely to be justified given the uncertainties in the data. The issue of generalisability to other settings or countries was not addressed. However, some comparisons with other studies supporting the clinical and economic results from the present investigation were reported. Results do not appear to have been presented selectively.

Implications of the study
Further research is required within the context of a high-cost technique and with different anaesthesia.
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