The effect of a drug and supply cost feedback system on the use of intraoperative resources by anaesthesiologists

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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
Management of intraoperative resources by anaesthesiologists.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Anaesthesiology residents using anaesthesia on patients undergoing one of the following surgical procedures: carotid endarterectomy, lumbar decompression or cervical decompression.

Setting
The setting was secondary care. The economic study was conducted in New York, USA.

Dates to which data relate
The time period during which the study was conducted was not mentioned, although the duration for data collection for the primary study was 6 months. Three months later, data collection was resumed in the absence of feedback for another period of 6 months.

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

Link between effectiveness and cost data
Costing was undertaken on the same patient sample as that used in the effectiveness analysis.

Study sample
27 anaesthesiology residents were enrolled and randomised to the control group (n=14) and the feedback group (n=13), at the beginning of their rotation through the 4 neurosurgical operating rooms. The neurosurgical rotations generally lasted 4 weeks, although some residents were assigned for 2 weeks. For each rotation, the residents were matched into pairs of similar seniority to minimise differences in experience between the two groups. The residents were involved in carotid endarterectomy procedures on 44 patients (25 feedback group and 19 control group), lumbar decompression procedures on 55 patients (29 feedback and 26 control) and cervical decompression procedures on 27 patients (15 feedback and 12 control).
Patient groups were comparable in terms of age and ASA physical status I and II. Data for intraoperative drug use were gathered from an automated anaesthesia record-keeping system (Lifelog, Modular Instruments, Inc, Malvern, PA) or, in a small number of cases, from hand-written anaesthesia records. Cost feedback forms were given to each resident in the feedback group on the workday after a study case. The report included the patient's name, procedure and anaesthesia-related costs. In addition to total cost, expenses were separated into drug and supply categories. The three most expensive drugs and supplies were also listed on the feedback sheet.

Information sheets listing the costs of all anaesthetic medications and supplies were posted directly above the anaesthesia medication charts in each operating room 1 year before the beginning of the study and were updated regularly. Members of the feedback group were informed at the beginning of the rotation that they would receive a written cost analysis of their spending behaviour, while the control group received no additional information.

**Study design**
This was a randomised prospective controlled study.

**Analysis of effectiveness**
The main outcome used in the analysis was the reduction in the quantity of anaesthesia drugs used following the introduction of the individualised written feedback on performance relating to the drugs and supplies used.

**Effectiveness results**
Lower use rates were recorded for propofol and etomidate and for patient warming devices in the feedback group.

**Clinical conclusions**
The reduction in the use of propofol and etomidate and in-patient warming devices did not result in noticeable side effects.

**Measure of benefits used in the economic analysis**
The authors did not provide any measure of benefits.

**Direct costs**
Direct health service costs were considered namely drugs and supply costs. Running departmental averages were calculated for the different types of procedure based on the last 15 cases performed. However, the unit costs of the drugs and supplies were not stated.

**Statistical analysis of costs**
ANOVA analysis and t-test were used.

**Indirect Costs**
Indirect costs were not considered.

**Currency**
US dollars ($).

**Sensitivity analysis**
No sensitivity analysis was performed.
Estimated benefits used in the economic analysis
The authors did not provide any measure of benefits.

Cost results
Members of the feedback group had significantly lower costs for carotid endarterectomies ($79.98 +/- $15.20 versus $97.59 +/- $21.53) and for lumbar decompressions ($56.72 +/- $16.49 versus $76.05 +/- $20.11). Three months after the feedback period a follow-up data set was collected in the absence of feedback. This revealed a significant rebound in overall cost by the feedback group for both procedures.

Synthesis of costs and benefits
The authors did not provide any measure of benefits, so a synthesis was not possible.

Authors' conclusions
Using resident anaesthesiologists, the authors showed that the written feedback of individualised data can be used to lower the overall cost of intraoperative drugs and supplies used for anesthesia in the absence of mandated clinical guidelines.

CRD COMMENTARY - Selection of comparators
The reason for the choice of the comparator (non-existence of a written feedback system) was clear, as both resource management alternatives were used in the authors' setting. You, as a database user, should consider if the same applies to your own setting.

Validity of estimate of measure of benefit
The authors did not provide any measure of benefits.

Validity of estimate of costs
Although the costing was adequately described, the authors presented costs at an aggregated level rather than reporting separate information on unit costs and resources.

Other issues
The cost results may not be generalisable to other settings or countries. The authors noted that some members of the control group might have known about the study and also have reduced their costs, thus causing underestimation of the true impact of feedback. Also the study was limited by a small sample size.

Implications of the study
This study describes an interesting exercise that achieves cost-containment through a management system instead of mandated clinical guidelines.

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