Impact of clinical pathways on hospital costs and early outcome after major vascular surgery

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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
Implementation of vascular clinical pathways after major vascular surgery.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Patients who were electively admitted for extracranial, infrarenal abdominal aortic and lower extremity arterial surgery.

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

Dates to which data relate
The main effectiveness data were extracted from a clinical trial conducted between 1992 and 1994. Resource and cost data were mainly derived from 1992-4 sources. The price year was not clearly stated.

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

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

Study sample
The study sample was a cohort of patients who were electively admitted between 1 September 1992 and 30 August 1993 (group 1, n=145) and 1 January to 31 December 1994 (group 2, n=177) for extracranial, infrarenal abdominal aortic and lower extremity arterial surgery. For group 2 patients, vascular critical pathways were instituted, a dedicated vascular ward was established and outpatient preoperative arteriography and anesthesiology-cardiology evaluations were performed. Power calculations to determine the sample size were not stated. Patients who required emergency surgery, patients transferred from other hospitals and patients who required prolonged preoperative treatment including intravenous antibiotics or anticoagulation were excluded from the analysis.
Study design
The study was a non-randomised trial with historical controls. For group 2 patients, vascular critical pathways were instituted, a dedicated vascular ward was established and outpatient preoperative arteriography and anesthesiology-cardiology evaluations were performed. No patients were lost to follow-up.

Analysis of effectiveness
The analysis of the clinical study was based on treatment completers only. The primary health outcomes used in the analysis were same-day admissions, average length of stay, overall mortality rate, cardiac complications, pulmonary complications, and neurologic complications, readmission within 30 days, and morbidity or mortality rates.

Effectiveness results
The same-day admissions were estimated to have increased significantly (80% versus 6.2%, p<0.0001), and the average length of stay (LOS) was estimated to have decreased (3.8 versus 8.8 days, p<0.0001) in group 2 versus group 1, respectively. No significant differences were estimated between groups 1 and 2 in terms of overall mortality rate (2.1% versus 2.3%), cardiac complications (3.4% versus 4%), pulmonary complications (4.1% versus 1.7%), neurologic complications (1.4% versus 0%) or readmission within 30 days (11.3% versus 9.2%, p>0.05). No differences were estimated in morbidity or mortality rates when each type of surgery was compared.

Clinical conclusions
There were no statistically different clinical outcomes with the clinical pathway when compared with treatment without the pathways. Same day admissions and LOS were, however, significantly different in favour of the pathway.

Measure of benefits used in the economic analysis
As the effectiveness results are assumed to be statistically similar, the benefits were expressed in terms of annual hospital cost savings.

Direct costs
Costs for each type of surgery were included. Costs of the skilled care unit, visiting home nurses and extra time required by the physician and office personnel to evaluate patients more frequently in the postoperative period were not included. Quantities were analysed separately from the costs. Discounting was not undertaken. The quantity/cost boundary adopted was the third party payer. The date to which the prices refer was not stated.

Statistical analysis of costs
Not undertaken.

Indirect Costs
Not addressed.

Currency
US dollars ($).

Sensitivity analysis
No sensitivity analysis was performed.

Estimated benefits used in the economic analysis
Annual hospital cost savings totalled $1,267,445 for patients undergoing major vascular surgery in group 2 (pathway) compared with group 1.

Cost results
The mean per patient cost for EC surgery was $23,231 in group I and $17,721 (difference $5,510) in group II. The corresponding figures for aortic surgery were $45,694 and $34,198 (difference $11,496). The corresponding figures for bypass surgery were $32,867 and $26,938 (difference $ 5,929). The annual hospital cost savings were $281,010 for EC, $494,328 for aortic, $492,107 for bypass and $1,267,445 for Total.

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

Authors' conclusions
Same-day admission and early hospital discharge for patients undergoing elective major vascular surgery can result in significant hospital cost savings without apparent increase in morbidity or mortality rates.

CRD COMMENTARY - Selection of comparators
The rationale for the choice of comparator is clear. The comparator (clinical pathways) was chosen since it allows a reduction in inpatient days and therefore hospital costs.

Validity of estimate of measure of benefit
The estimate of measure of benefit used in the economic analysis is likely to be internally valid.

Validity of estimate of costs
Adequate details of the methods of quantity/cost estimation were given. As noted by the authors, one potential problem with this study was that it did not consider the costs of the skilled care unit, visiting home nurses, and extra time required by the physician and office personnel to evaluate patients more frequently in the postoperative period. Furthermore, differences in hospital charges for different geographic areas (urban, suburban and rural community hospitals) make generalisation difficult.

Other issues
The issue of generalisability to other settings was addressed and appropriate comparisons were made with other studies. The results were not presented selectively. However, this study does not conclusively demonstrate that the change in strategy regarding same-day admissions and early discharges is as safe as extended perioperative hospital stay.

Implications of the study
Further research is required to include costs of the skilled care unit, visiting home nurses, and extra time required by the physician and office personnel to evaluate patients more frequently in the postoperative period.

Source of funding
Supported by a grant from the John F Connelly Foundation and the Pennsylvania Hospital Funds.

Bibliographic details