Cost containment in cardiac surgery: results with a critical pathway for coronary bypass surgery at the New York Hospital-Cornell Medical Center


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
A critical pathway introduced to help to reduce costs, shorten hospital length of stay (LOS), and streamline patient care versus routine practice exercised before the introduction of the clinical pathway for the management of patients undergoing uncomplicated coronary bypass surgery.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Patients undergoing coronary bypass surgery.

Setting
Hospital. The economic analysis was carried out in New York, USA.

Dates to which data relate
The effectiveness and resource utilisation data related to the intervention were gathered between 1 March and 31 August 1995. The corresponding data related to the comparator were collected in 1994. The fiscal year was 1995.

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

Link between effectiveness and cost data
The costing was undertaken on the same patient sample as that used in the effectiveness analysis. The costing for the intervention was performed prospectively and retrospectively for the comparator.

Study sample
Power calculations were not used to determine the sample size. The critical pathway group consisted of 114 patients versus 382 patients in the historical control group.

Study design
A non-randomised trial with historical controls was carried out in a single centre. The duration of the follow-up was
until discharge, death, or readmission. Loss to follow-up was not reported.

Analysis of effectiveness
It was not explicitly specified whether the analysis of effectiveness was based on intention to treat or treatment completers only. The primary health outcomes were mortality and readmission rates. The groups were believed, but not shown, to be comparable.

Effectiveness results
The mortality rate for the critical pathway group was 0.9% (1/114) versus 1% (4/382) in the historical control group. The readmission rate for the critical pathway group was 7% (9/114) versus 7.6% (29/382) in the historical control group.

Clinical conclusions
The critical pathway "did not affect clinical outcome in terms of the hospital mortality. It is important to note that the more expeditious discharge did not generate a higher readmission rate, which implied that significant postoperative problems were not overlooked".

Measure of benefits used in the economic analysis
No summary benefit measure was identified in the economic analysis, and only separate clinical outcomes were reported.

Direct costs
The quantities were not fully reported separately from the costs. The cost items were reported separately. The cost analysis covered the costs of laboratory, electrocardiogram, radiology, blood, pharmacy, physical therapy, and operative room/recovery room. The perspective adopted in the cost analysis was not explicitly specified. The cost analysis was based on actual resource use and cost data. Hospital charges were translated into true costs using the Medicare cost-to-charge ratio. The inflation rate adjustment was not implemented. The price date was 1995.

Statistical analysis of costs
Student’s t test was used to compare the study groups in terms of cost items and total costs.

Indirect Costs
Not considered.

Currency
US dollars ($).

Sensitivity analysis
No sensitivity analysis was performed.

Estimated benefits used in the economic analysis
Not applicable.

Cost results
The average (standard deviation) cost per patient was $7,423 (2,260) for the critical pathway group versus $8,604 (3,712) for the historical control group, (P<0.0001).

**Synthesis of costs and benefits**
Costs and benefits were not combined since the use of the critical pathway was regarded as the weakly dominant strategy.

**Authors’ conclusions**
By identifying, codifying, and categorising all the critical steps in the patients' total experience, the multi-disciplinary team has been able to streamline the preoperative care, eliminate unnecessary resource utilisation, and expedite discharges by identifying potential roadblocks early in the postoperative care. This was accomplished without jeopardising patient safety, as the authors demonstrated.

**CRD COMMENTARY - Selection of comparators**
The reason for the choice of the comparator is clear.

**Validity of estimate of measure of benefit**
The internal validity of the estimates of the effectiveness measures may be weakened by the lack of randomisation and the fact that data collection for the control group was conducted retrospectively. Although the two groups were believed to be comparable this was not demonstrated.

**Validity of estimate of costs**
The resource utilisation was only broadly reported separately from the costs. Adequate details of methods of cost estimation were not given. True costs were not measured directly, but were estimated based on charge data by using a cost-to-charge ratio.

**Other issues**
In view of the lack of randomisation and sensitivity analysis, the results need to be treated with some caution. The issue of generalisability to other settings or countries was not addressed.

**Source of funding**
None stated.

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