The effect of physical therapy on respiratory complications following cardiac valve 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
Physical therapy for the prevention of respiratory complications following cardiac valve surgery.

Type of intervention
Primary prevention.

Economic study type
Cost-effectiveness analysis.

Study population
All patients scheduled for cardiac valve surgery.

Setting
Hospital. The economic study was performed in Canada.

Dates to which data relate
Effectiveness and resource use data were collected in the period October 1991 to April 1993. No information on the price year was provided.

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

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

Study sample
During the study period 123 patients were scheduled for cardiac valve surgery. Of these, only 78 were eligible and gave informed consent to participate in the study. Three out of the 78 patients had to be excluded from the study because extubation was delayed to greater than 72 hours. The remaining 75 patients were randomly assigned to one of two standardised treatments: low intensity therapy (group one) or high intensity therapy (group two). No evidence of power calculations to determine study sample size was provided.

Study design
This was a single centre randomized controlled trial. Patients were followed up until hospital discharge.
Analysis of effectiveness
Analysis of effectiveness was based on intention to treat. Clinical effectiveness was determined by pulmonary function,atelectasis score, improvement in lobar and sublobar collapse and chest radiographs, and development of pneumonia. Groups were shown to be comparable in their clinical characteristics before the intervention.

Effectiveness results
No significant differences in the primary outcomes were found.

Clinical conclusions
The authors concluded that following valvular surgery, in the absence of specific clinical indications, there is no need for the prescription of labour-intensive physical therapy.

Measure of benefits used in the economic analysis
The authors did not produce a measure of benefit as the two interventions showed similar effectiveness outcomes and the analysis was based on the difference of costs only.

Direct costs
Cost/quantities were not reported separately. Items included in costing were: nursing cost per patient, physiotherapy time cost per patient, and atelectasis cost. Item costs were based on authors’ estimates, where institutional marginal cost of nursing care was derived based on the medicus score (nursing time for a patient, based on the patient's cognitive and ambulatory capabilities). Discounting was not applied as it was not relevant.

Statistical analysis of costs
Student's t test was used to show differences between two means.

Indirect Costs
Not considered.

Currency
Canadian dollars (Can$).

Sensitivity analysis
Sensitivity analysis was not performed.

Estimated benefits used in the economic analysis
Not applicable.

Cost results
The total cost per patient in (group one, group two) were reported as follows:

Nursing cost per patient, Can$535 and Can$554 (not significant),
physiotherapy time cost per patient, Can$92 and Can$194 (significant difference),
and atelectasis cost, Can$25 and Can$57 (significant difference).
Synthesis of costs and benefits
Not applicable.

Authors’ conclusions
The costs incurred with a more labour-intensive physical therapy regimen were more than double those of less intensive regimens. Furthermore, this increment in cost was far from offset by clinical improvement in atelectasis. Consequently, the authors did not recommend the prescription of labour-intensive physical therapy in the absence of specific clinical indications.

CRD COMMENTARY - Selection of comparators
The selection of the comparator was clearly and fully justified.

Validity of estimate of measure of benefit
As pointed out by the authors, the results of the study might not be valid in other settings. With regard to sample size and design, the results of the study seem to be internally valid.

Validity of estimate of costs
Despite the fact that several important assumptions were made in estimating the costs, no sensitivity analysis of the cost estimates was performed.

Other issues
Although the authors contrasted their findings with those from other similar studies, the issue of generalisability of the results was not investigated. The authors did, however, discuss the limitations of their results.

Implications of the study
Further investigation regarding the cost-effectiveness of physical therapy for the prevention of respiratory complications following cardiac valve surgery is needed.

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