Fontan palliation versus heart transplantation: a comparison of charges
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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
Fontan palliation vs heart transplantation.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Patients with univentricular physiologies.

Setting
Hospital. The study was carried out in Houston, Texas, USA.

Dates to which data relate
Data for resources used and for the effectiveness analysis were collected between 1988 and 1992. The prices used were those prevailing in 1992 and 1993.

Source of effectiveness data
Single study.

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

Study sample
The sample size was not determined using power calculations. There were 108 patients overall:82 underwent the Fontan procedure, and 26 underwent transplant.

Study design
Retrospective single-centre, cohort study. The duration of follow-up was 1.8 (+/- 1.3 SD) years for the Fontan group and 1.8 (+/- 1.4 SD) years for the transplant group.

Analysis of effectiveness
Analysis was based on intention to treat. The primary outcome used was mortality rate.

**Effectiveness results**
The Fontan group had a 21% mortality rate whilst the transplant group had a 20% mortality rate. The difference failed to reach statistical significance (p=1.0).

**Measure of benefits used in the economic analysis**
Since the study revealed no difference in clinical benefit between the two strategies, the economic analysis was based on the difference in costs only.

**Direct costs**
Costs were not discounted. Costs and quantities were analysed separately. The costs measured were operating costs, costs of complications, and monitoring and testing costs. The boundary adopted was the hospital. The estimation of quantities was based on actual data. The quantity of resources was measured between 1988 and 1992. The prices refer to 1992 and 1993. The source of quantity data was the authors' own institution. The prices were reflated.

**Statistical analysis of costs**
Mean values and standard deviations were reported. The comparison of differences carried out using the unpaired Student t test.

**Currency**
US dollars ($).

**Estimated benefits used in the economic analysis**
Not applicable.

**Cost results**
The average hospital charge for the Fontan procedure was $27,319.94 (+/- $1,715.28). The corresponding figure for the transplant option was $49,249.42 (+/- $7,461.9). The follow up charges were $2,438.82 (+/- $219.24) and $63,405.63 (+/- $10,017.28), respectively. Medication charges were $1,057.63 (+/- $45.76) and $12,000 (+/- $679.37), respectively. All differences had a p value <0.001.

**Synthesis of costs and benefits**
Not applicable.

**Authors’ conclusions**
The data clearly indicated heart transplantation to be more costly than the Fontan procedure. However, the success of a Fontan procedure is largely dependent on adherence to a rigorous selection criteria. Carrying out the Fontan procedure when any of these criteria are violated can result in immediate failure, significantly higher postoperative complication rates and a marked increase in the incidence of short and long term morbidity and mortality. All of these can lead to a higher overall cost of treatment compared to transplant operation as a first approach. Therefore, identification of high risk patients is needed in order to avoid the possibility of transferring patients from Fontan to transplant procedures.

**CRD Commentary**
In addition to the groups compared, a group of 4 patients initially underwent the Fontan procedure and, shortly after
discharge, experienced complications necessitating evaluation for heart transplantation (Fontan-pre-transplant group). This group was only analysed with respect to costs, and the results obtained represent the base upon which part of the conclusions are drawn. Costs were proxied by charges and were not discounted, despite the fact that the mean duration of follow up was 1.8 years for both groups. Some costs were not included: itemized laboratory fees, individual charges for physical and respiratory therapy, nursing charges, ventilator charges in ICU, transplantation listing fees and donor maintenance charges. These omissions (due to lack of data) were not thought to alter qualitatively the results of the study (due to insignificance in length of hospitalization and overall complication rates).

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