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Assessment of costs to donor hospitals for organ transplantation

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In 1987, die Department of Health in the UK set up a working party to identify reasons contributing to a shortfall in donor organs. One recommendation was reimbursement to the District Health Authorities for costs incurred in providing the donor organs. The figure chosen was not to be seen as an incentive to donate organs, merely as an appropriate compensation for the costs incurred. There would be no direct payment to doctors, trustees or relatives of the donor. With the development of the competitive health care environment in the United Kingdom, the reimbursement of donating hospital costs is being considered with these data.

Key words: Costs – Donor hospitals

Method

The study started on May 1st, 1989. Prospective information on resource use was sought by questionnaire for all potential donors in 5 Health Regions during a 7-month period. The period of care for which data were collected was from the time of the second brain stem death tests to the closure of the operating theatre. The information was obtained and recorded by Transplant Coordinators or by the key ward or operating theatre staff concerned. Costs directly attributable to the management of a potential donor included staff, consumables, capital costs, general services and capital charging.

Staff costs. Medical and nursing costs were based on recorded time spent with the donor, and on behalf of the donor but away from the bedside. For nursing staff the midpoint of the relevant salary scale was used, plus 30% for extra duty allowance and cover and a further 15% on costs (employers' contributions for pensions, etc.). For medical staff the midpoint of the salary scale for each grade of staff was taken. Gross costs were used which included average merit awards for consultants and UMT for junior staff. Ancillary staff costs were based on time spent from the opening to closure of the operating theatre and in transporting the donor between the ward, operating theatre and mortuary. The midpoint of the relevant salary scale was used. Gross costs were used plus an additional 30% for overtime.

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Consumables. Drugs were costed at the East Anglian contract price. Tests and disposables were based on the Addenbrooke's Hospital costs. Blood products were costed at standard Blood Transfusion Service costs.

Capital costs. All items of capital equipment were attributed to individual donors according to use, based on estimates of present values, using a discount rate of 6%. Ward equipment costs were attributed on a daily basis, theatre equipment on a session basis. Indirect hospital costs were apportioned to the donor on a daily rate.

General services. Such items as administration, medical records, training, catering, cleaning, laundry, transport, etc. were also included. The Addenbrooke's Hospital mid-1989 prices were used and were based on the length of time between confirmation of brain stem death and the onset of organ retrieval.

Capital charging. It is estimated that this will add 20% to current revenue costs. The cost of the donors' use of resources was therefore increased by 20%. The only exception to this was for charges attributed specifically to items of capital equipment priced at £1,000 or more.

Data analysis was carried out using the Statistical Package for the Social Sciences (SPSS Inc.) and Supercalc 5 (Computer Associates).

Results

Clinical information was obtained on 112 potential donors. This comprised data on 38 kidney donors, 70 multi-organ donors, and 4 potential donors from whom organs

Table 1. Consolidated costs by category of cost (£)

Cost category	Mean	Minimum	Maximum	Total (%)
A. Staff consulting	16	0	103	1820 (3)
B. Blood products	26	0	386	2910 (5)
C. Investigations	28	0	192	3105 (7)
D. Drugs maintenance	21	0	193	2392 (4)
E. Drugs operation	10	0	158	1111 (2)
F. Equipment and theatre	76	0	94	8552 (15)
G. Ward staff	166	0	758	18636 (34)
H. Theatre staff	131	0	524	14704 (27)
I. General services	17	0	93	1831 (3)
Total	492	0	1396	55061 (100)

Table 2. Consolidated costs by category of donor (£)

	Number	Mean	Median	Minimum	Maximum	Total
Kidney	38	410	375	134	887	15566
Multi-organ	70	559	482	151	1396	39123
Abandoned	4	93	82	0	208	373
All donors	112	492		0	1396	55062

were not retrieved. Costs consolidated by category cost are shown in Table 1. Costs consolidated by category of donor are shown in Table 2.

Discussion

It is clear that staff salaries contribute substantially (> 60%) to the estimate of overall costs.

The actual mean duration of the interval between the diagnosis of brain stem death and the start of the donor operation was 5.4 h, with a median of 4.0 h for kidney donors and 5.5 h for multi-organ donors. The interval between the first and second tests for brain stem death varied from 0 to 64 h with a mean of 9 h.

The mean duration of the donor operation was 1.5 h for kidney donation (median 1.25) but longer at 3.2 h for multi-organ retrieval (median 3). To be added to this is the recorded time spent opening, preparing and closing the theatre. This time difference between the two categories of donor will be reflected in the overall costs.

Proposing a single figure estimate of costs incurred in relation to potential donors not coming to organ retrieval is problematical. The stage at which plans may be abandoned is variable. The main component of the costs will be directly related to the number of staff and the time spent in caring for the donor. Looking at the relative cost contributions of the maintenance period and of organ retrieval, the split was approximately 55:45 in our study for all categories combined.

In conclusion, a median cost of £375 for a kidney donor and £482 for a multi-organ donor should be taken as minimum estimates. Though less correct statistically, the mean values obtained may be more realistic and are most unlikely to be overestimates. A value of around 45% of the mean might well be a reasonable estimate of the cost incurred in the care of potential donors not coming to successful donor operation, though clearly overcompensating in the situation where plans for organ retrieval were abandoned at an early stage.