

## The Social and Emotional Impact of Cardiac Transplantation

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*To date, there has been limited systematic research in the area of the emotional impact of cardiac transplantation. Since September 1984, a prospective study addressing this issue has been in progress at St. Vincent's Hospital, Sydney, Australia.*

*Initial results suggest that anxiety, associated with declining health and adjustment to the prospect of transplantation, was the major issue at pre-transplantation. Follow-up at the time of their first hospital discharge after transplantation and again at 3 months showed improvement in all psychological measures and did not identify any psychological morbidity.*

**W**HILE THE RELEVANCE of psychological factors to outcome in cardiac transplantation patients is acknowledged, empirical research in this field is limited.<sup>1-4</sup> However, a recent heart transplantation study has made an important contribution in this area.<sup>5</sup>

Being aware of the role of stress concerning response to surgery and subject compliance with medical advice, we set out to evaluate the role of psychological factors in cardiac transplantation.<sup>6</sup> The study was designed prospectively, with the aim of evaluating the impact of transplantation on psychological variables and assessing their significance at various points of time after transplantation.

Cardiac transplantation commenced at St. Vincent's Hospital in February 1984. To date, 25 transplants have been performed on 23 subjects. Our overall survival rate is 84%. The prospective study on the emotional and social impact of transplantation commenced in

September 1984. This evaluation formed part of a psychosocial assessment.

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### PATIENTS AND METHODS

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Patients for this study were consecutive referrals for cardiac transplantation who were accepted into the program. Those under the age of 15 were excluded. Subjects were assessed prior to transplantation and at first discharge (after transplantation) from the hospital. Some subjects have been followed-up at 3 months after discharge, and further follow-up will occur on all subjects at 3-month intervals for 2 years. Those who are on the waiting list will also be followed-up at 3-month intervals, and will be used as a control group.

Psychological status was assessed using standardized psychological tests. The tests given were the *Beck Depression Inventory*, the *Spiegelberger State Trait Anxiety Inventory*, the

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*Campbell Well Being Scale* and a number of ad hoc self-rating scales, including body concept and social life.

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### STATISTICAL ANALYSIS

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The statistics presented are mainly descriptive. No attempt has been made to control for demographic and medical data. However, Student's t test analysis has been applied to the pre- and post-surgery data from groups that have been followed-up at first discharge.

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### RESULTS

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#### Initial Assessment

*Demographics:* To date, 23 subjects have been assessed and accepted into the program. The mean age of the patients studied was 42.3 years, with a range of 16 to 56 years of age. There were 20 males and three females in the group. Seventeen were married and six were single. The years of schooling achieved averaged 11.7 years, with a range of six to 17 years.

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#### DEPRESSION

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Diagnosing depression in subjects with end-stage cardiac disease can be difficult.<sup>4</sup> Symptoms such as poor appetite, weight loss and fatigue, usually associated with depression, are universal in subjects with end-stage heart disease and almost certainly are related to their decline in physical status. For this reason, we set a high cut-off on the *Beck Scale* prior to rating subjects as depressed. On this basis, only four were rated as depressed (Table I).

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**TABLE I.** Percent of Subjects Showing Mood Disturbance at Initial Assessment

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Depression: 4/23 (17.4%)  
Anxiety: 14/23 (60.8%)

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#### Anxiety

Both *Trait* (general) and *State* (specific reactive) anxiety were scored. A significant difference was found between the two scores within the group. Individual inspection

showed 14 subjects to be anxious. A subject was rated as pathologically anxious if *State* anxiety scores fell into the abnormal range, or if the difference between the *Trait* anxiety and *State* anxiety scores was greater than would be expected on inspection of the tables (Tables I and II).

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**TABLE II.** State and Trait Anxiety at Initial Assessment

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	Mean	p
Trait	37.8	<.001
State	48.2	<.001

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#### Body Concept

Body concept was measured by having the subject rate his or her body image on ten semantic differential items.<sup>7</sup> The item pairs were: strong/weak; pleasing/displeasing; lively/sluggish; energetic/tired; comfortable/uncomfortable; fast/slow; flexible/rigid; satisfactory/unsatisfactory; active/passive; healthy/unhealthy.

A 10-point rating scale was used for each item. On this basis, subjects could score within the range of 0 to 100. The scores were arbitrarily divided so that any score falling between 0 and 30 was rated as a positive body image; a score between 31 and 70 was rated as average body image, and a score between 71 and 100 was a negative body image. The group mean was 66, with a standard deviation of 14.7.

#### Index of Well-Being

This scale provided a subjective measure of well-being and was a quality-of-life measure. The index of well-being ranges between 2.1 (which indicates a low well-being) and 14.7 (which indicates a high well-being). The mean for the group was at the low end of the normal range (Table III).<sup>8</sup>

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**TABLE III.** Index of Well-Being at Initial Assessment

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	Mean	S.D.
Normal	11.7	± 2.21
Subjects	9.81	2.65

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## Social Activities

All subjects reported a decline in frequency and enjoyment of social activities.

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### OUTCOME FOLLOWING INITIAL ASSESSMENT

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Of the 23 subjects, 12 have been transplanted. Nine have been discharged from the hospital and followed-up at first discharge. Two subjects have died and one is still in the hospital. Eleven have been placed on the waiting list; four of these have been followed-up at 3 months, three have died, and the remainder are awaiting postoperative follow-up at 3 months.

#### Follow-up at First Discharge

##### *Demographics*

There were nine patients in the study who were discharged — eight were male and one was female. The age ranged from 18 to 52, with a mean age of 39.5. Six of the patients were married and three were single. The educational background of the patients was a mean of 11.2 years, with a range of 6 to 15 years of education.

##### *Depression and Anxiety*

No subjects at pre-assessment scored in the pathological range on the *Beck Depression Scale*. However, at follow-up, there was a significant reduction in depression scores. This was mainly due to improvement in the subjects' physical health, which meant they no longer scored highly on symptoms such as poor appetite, weight loss and fatigue (Table IV).

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**TABLE IV.** Mean Scores at Assessment and First Discharge

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	Pre	Post	p
Depression	11.6	2.7	<.01
Anxiety	47.6	30.9	<.01
Body concept	73.7	29.0	<.001
Well-being	8.6	12.7	<.01

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At pre-surgical assessment, 14 of the 23 subjects obtained pathological scores on the *Spielberger State Trait Anxiety Scale*. At first discharge after transplantation, all nine showed statistically significant reduction in scores, with all scores now being in the normal range.

## Body Concept

Mean body concept scores showed a significant movement towards the positive end of the scale in all cases (Table IV).

### *Index of Well-Being*

All subjects showed an improvement in their well-being, which was statistically significant (Table IV).

At this stage in the study, there was no relationship between psychological measures and the subjects' medical condition post-transplantation, such as the number of episodes of moderate or severe rejection, readmission to hospital, and episodes of infection.

Some subjects have been followed-up at 3 months after discharge. The improvement noted on discharge has been maintained. Subjects are also returning to social activities, though not at the pre-morbid level.

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### SUBJECTS FOLLOWED-UP ON WAITING LIST

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As stated, only four subjects have been followed-up while on the waiting list. Two of them have shown little or no change since their initial assessment. The other two have shown improvement, resulting from better health after treatment at our Center. As there were only a few subjects in this group, and because any change was cancelled out by half the group moving in one direction and half in the other, the results will not be presented at this stage.

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## DISCUSSION

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Although the subjects during the pre-treatment phase did not demonstrate any long-standing predisposition to an anxiety reaction, they did show a disproportionate elevation of scores on a test-assessing, acute, immediately-experienced anxiety. Their body images were generally poor; they were mildly dissatisfied with their quality of life, and their social activities were restricted. They were not, however, pathologically depressed — a finding confirmed by independent psychiatric evaluation. There were no cases of pharmacologically treatable or endogenous depression identified.

Thus, there did not appear to be any hard evidence of increased psychiatric morbidity

among the group of patients being assessed for cardiac transplantation. The type of psychological reactions identified represents a reasonable and understandable response to the stress necessarily involved in adjusting to decline in physical health and the prospect of undergoing such a major surgical procedure. The findings of elevated levels of acute anxiety at the presurgical phase have been noted by other studies.<sup>1-4</sup> The results could indicate a need for psychologically-based stress management programs for some patients in the presurgical phase.

At first discharge from the hospital, there was a highly significant trend towards improvement in all psychological measures used in this study. The transplanted subjects were in better health and their life expectancy had improved considerably. (The positive changes in the psychological measures may be explainable in these terms.) Such changes may reflect a short-term "honeymoon" response. Follow-up data will be necessary to establish the stability of such changes. The limited data available has suggested that the changes will be sustained.

Because of the limited data available, there was no strong relationship between negative psychological reactions and the incidence of post-surgical complications or compliance. However, research on this issue is at an extremely preliminary stage.

In some respects, our results appear to be similar to the findings of the National Heart Transplantation Study, and perhaps lend support to their conclusion that human beings

have remarkable resilience and adaptability in coping with significant stress.<sup>5</sup>

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## REFERENCES

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1. Christopherson LK, Lunde DT. Selection of cardiac transplant recipients and their subsequent psychosocial adjustment. *Seminars in Psychiatry* 1971; 3:36-45.
2. Freeman AM III, Watts D, Karp R. Evaluation of cardiac transplant candidates: Preliminary observations. *Psychosomatics* 1984; 25:197-207.
3. Watts D, Freeman AM III, McGiffen DG, Kirklin JK, McVay R, Karp RB. Psychiatric aspects of cardiac transplantation. *Heart Transplantation* 1984; III:243-247.
4. McAleer MJ, Copeland J, Fuller J, Copeland JG. Psychological aspects of heart transplantation. *Heart Transplantation* 1985; IV:232-233.
5. Evans RW and others of The National Heart Transplantation Study: Final Report. Battelle Human Research Centers, Seattle, Washington, 1984.
6. Johnson DW. Behavioural treatment in the reduction of coronary risk factors: Type A behaviour and blood pressure. *Br J Clin Psychol* 1982; 21(4):281-294.
7. Roviario S, Holmes DS, Holmsten RD. Influence of a cardiac rehabilitation programme on the cardiovascular, psychological and social functioning of cardiac patients. *J Behav Med* 1984; 7(1): 61-82.
8. Evans RW, Manninen DL, Garrison LP, Hart LG, Blagg CR, Gutman RA, Hull AR, Lowrie EG. The quality of life of patients with end stage renal disease. *N Eng J Med* 1985; 312(9):553-559.

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