

Caregiver burden and outcomes of caregiving of spouses of patients who undergo coronary artery bypass graft surgery

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BACKGROUND: Patients who undergo coronary artery bypass graft surgery often rely on spouses for care during recovery. Although often meaningful, caregiving may be stressful and affect spouses' ability to provide care to the patient.

OBJECTIVES: The purpose of this study was to compare burden and caregiving outcomes across three groups of spouses. Spouse groups varied by the interval of time between surgery and follow-up, which may have been 3, 6, or 12 months.

METHODS: This cross-sectional comparative study recruited a convenience sample of 166 spouses on the basis of a power analysis. A total of 166 spouses completed caregiver surveys on burden and other caregiving outcomes.

RESULTS: Total, objective, and subjective burden levels were low to moderate. Although no burden differences were found between groups, men had higher total burden but more positive caregiving outcomes. Future outlook and social activities were less positive in the 6-month group. Burden levels were not lower, nor were caregiving outcomes higher, in the 12-month group, suggesting a steady caregiving demand across the first year after coronary artery bypass graft surgery.

CONCLUSION: Longitudinal investigations are needed to understand burden and caregiving outcomes over time and the impact of burden on spousal and patient recovery outcomes. (*Heart Lung*® 2007;36:170–187.)

As the number one killer in the United States today, coronary artery disease (CAD) claims more than 500,000 lives each year.¹ Coronary artery bypass graft (CABG) surgery is one of the most common procedures to treat symptoms of CAD. In 2002 alone, approximately 515,000 CABG surgeries were performed on 306,000 patients.² On discharge, most patients who have undergone CABG procedures rely on the assistance of family

caregivers throughout their recovery, usually from their spouse. Over the last decade, the typical length of hospital stay after CABG surgery has been dramatically reduced; this change potentially places more burden on the patient's caregiver.^{3–6} Currently, the average age of patients undergoing CABG procedures is estimated at 65 years.⁷ This increasing age potentially prolongs the expected recovery course and the length and extent of the caregiving role for an elderly patient's spouse. With the inevitable aging of the U.S. population, such burden will undoubtedly become an even more important societal concern as the ages of the patients who undergo CABG surgery and the caregivers increase.

Although caregiving roles may be meaningful, the preponderance of evidence points to the stress of the caregiving experience. This stress, also known as caregiver burden, may produce a "hidden patient" as a result of the undesirable physical, psychologic, relational, and financial consequences experienced

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by the caregiver.⁸ Caregiver burden has been linked to psychologic disturbances including anxiety, depression, anger, and loss,⁹⁻¹² as well as undesirable physical effects including stress disorders, general health deterioration, and a substantially increased risk of mortality.¹³ Thus, although care provided by family members is unpaid, these services are not provided without a price to the health of caregivers and society as a whole.^{4,14-16}

BACKGROUND

Caregiver burden has been studied extensively in relation to dementia. High levels of burden found among these caregivers are not surprising because of the progressive downward health trajectory in this population.^{14,17-21} Although caregiver burden has been well documented across the lifespan in other acute²²⁻²⁶ and chronically ill populations,²⁷⁻³⁴ few studies have examined burden in the context of CABG surgery.^{3,5,6,12,35,36} Caregiving may be different after an acute event such as CABG surgery because there is an expectation that the patient will be better both symptomatically and functionally after surgery. Two quantitative CABG studies found caregivers report low-to-moderate objective and subjective burden 1 to 6 weeks³ and 1, 3, and 12 months after surgery.³⁷⁻³⁹ Caregivers reported most burden with monitoring clinical progress, managing behavior, providing emotional support, and assuming household tasks.^{3,5,6} In one longitudinal study, subjective burden increased after surgery from 1 to 3 months³⁷ and then slightly diminished at 1 year³⁸ (the latter change was not significant). These findings suggest that although patient recovery might be progressing, emotional sequelae in caregivers were still evident, even at 1 year after surgery. The stress associated with these activities is concerning given caregiver burden has been found to be a significant predictor of poor physiologic and psychologic recovery outcomes 3 months after hospital discharge of patients who have undergone CABG.³⁷

Qualitative studies have also validated that caregiving after CABG surgery involves direct and indirect care activities of monitoring and providing comfort and support.^{5,6,35,36} Across the initial recovery trajectory, problems include (1) cognitive: lack of information and uncertainty about the patient's physical and emotional needs; (2) physical: concerns of how their own emotional stress and fatigue could interfere with their ability to physically fulfill caregiving demands; (3) psychologic: fears, uncertainties, and vulnerabilities about dealing with emergencies and losing the patient, anger about

patient noncompliance, feeling overwhelmed by responsibilities, and depression when their activities are restricted; and (4) behavioral: initially wanting to protect the patient and then reorganizing responsibilities, and dealing with mood swings of the patient.^{3,5,6,9,12} Although positive feelings toward the patient-caregiver relationship, often referred to as "mutuality," may mitigate burden in the early phase, such feelings may diminish in the later postoperative period because estrangement may develop from overprotective and distancing patterns.⁴⁰

Other than emotional distress, little is known about other outcomes of caregiving (OOC) of spouses who care for their marital partner after CABG surgery. Bakas and colleagues²² defined OOC as life changes that occur in emotional and adaptational outcomes (ie, social functioning, subjective well-being, and somatic health) as a result of assuming the caregiving role. Furthermore, gender differences in caregiver burden and OOC have not been explored in the CABG population. In this study, men are hypothesized to experience not only increased burden but also lower OOC because of the documented advanced heart disease of female patients who have undergone CABG⁴¹⁻⁴⁸ and the tendency of males to not be socialized as caregivers in our society. As a result, husbands may be less familiar with or competent with caregiving activities, and therefore caregiving may be more stressful and potentially lead to less desirable OOC. Thus, a knowledge gap exists regarding not only the caregiving tasks that are most time-consuming or difficult in the first year of recovery after CABG surgery (especially after the first 6 weeks), but also with respect to the OOC in the CABG population. This study was designed to fill this critical gap of knowledge. It is anticipated that with greater understanding, programs that prepare and support spouse caregivers to face the demands and difficulties of caregiving may be developed so that OOC can be maximized.

AIMS OF THE STUDY

The primary aim of this study was to describe and compare three groups of caregiving spouses (ie, spouses at 3, 6, or 12 months after CABG surgery) on caregiver burden and OOC. The four hypotheses tested were as follows:

Caregiver burden:

H1: Caregiver burden will be higher in the 3 and 6-month groups (compared with the 12-month group).

H2: Caregiver burden will be higher among male caregivers in all three time groups.

Outcomes of caregiving:

H3: OOC will be less positive in the 3 and 6-month groups (compared with the 12-month group).

H4: OOC will be less positive for male caregivers in all three time groups.

METHODS

A cross-sectional descriptive comparative design was used to study burden and caregiving outcomes between groups of spouses recruited 3, 6, or 12 months after CABG surgery. Convenience samples of spouses of patients undergoing first-time CABG surgery were recruited from three large Midwestern metropolitan medical centers. Inclusion criteria for spouses were (1) at least 21 years of age; (2) patient's legal spouse; and (3) living with patient and assuming the primary caregiver role. An a priori power analysis (moderate effect size .5, alpha .05, power .80) calculated that 159 spouses ($n = 53$ subjects for each group) were needed to detect differences in burden between the three groups.

After the study was approved by the institutional review board, patients who had undergone CABG surgery in the previous year were identified from a systemwide cardiac surgical database. The database was searched to identify patients at 3, 6, or 12 months after first-time CABG surgery who had a spouse. These spouses were sent a letter that explained the purpose of the study, along with the survey. Return of the survey served to express informed consent. Surveys were mailed over a 4-month period at the appropriate intervals to yield the needed 159 subjects (based on a projected 40% response rate). A total of 459 surveys were distributed, with slightly more sent to eligible spouses in the 3-month group because of initial low returns. One month later, spouses who had not returned surveys were sent a reminder letter.

Survey instrument

The survey sent to spouses assessed caregiver burden, other variables known to be related to burden, and OOC. The tools selected to measure these concepts had strong psychometric properties with satisfactory reliability and validity (Table I). The 24-page survey took approximately 30 to 45 minutes to complete.

Caregiving measures

The Caregiving Burden Scale (CBS) assesses direct, instrumental, and interpersonal caregiver tasks.⁴⁹ With two separate 5-point Likert-type scales, 15 caregiver tasks are rated for amount of time spent (objective burden) and level of difficulty (subjective burden). Scores range from 15 to 75, with higher scores indicating greater burden. Mean ratings of individual items are also examined to determine which caregiving tasks are associated with the most objective and subjective burden. A Cronbach's alpha of .91 (objective) and .93 (subjective) were found in this study, similar to those of Stolarik et al³ (.92 objective, .94 subjective). The Bakas Caregiving Outcomes Scale²² (BCOS) is a 15-item scale that measures changes in social functioning, subjective well-being, and somatic health of the caregiver in response to providing care. Items are rated on a 7-point scale from changed for the worst (1) to changed for the better (7). Possible scores range from 15 (worse outcomes) to 105 (positive outcomes). The BCOS has been tested in the population with stroke and lung cancer; evidence of its internal consistency is demonstrated with a Cronbach's alpha of .88,²² similar to the coefficient of .92 in this study. Construct validity was supported by significant correlation ($<.01$) with Rosenberg's Self-Esteem Scale, CBS, Appraisal of Caregiving Scale, Coping Responses Index, and Profile of Mood States.²²

Variables associated with burden

Other variables associated with burden were surveyed. Tools were included that measured (1) patient health status through spouse perceptions, including symptoms that are common after CABG surgery such as difficulty sleeping and neurocognitive changes; (2) caregiver characteristics of personal mastery and caregiver competence, and demographic characteristics such as age and gender; and (3) relationship/support factors of mutuality, marital satisfaction, and social support.

Patient health status. Patients' general health status was assessed through spouse proxy ratings on items from the short-form health survey [12 items] (SF-12), the Karnofsky Performance Scale (KPS), and standardized symptom scales. The spouses rated the patients' health on two items from the SF-12. The first SF-12 item asked spouses to rate their perception of the patients' general health at the present time, whereas the second asked them to compare their perception of the patients' health before surgery with their current

Table I
Caregiver survey instruments

Instrument	Description
SF-12 item	Perceptions of the patient's general health status at the: <ul style="list-style-type: none"> • Time of CABG surgery • Current time (3, 6, or 12 mo)
Neurocognitive symptoms	Perceived difficulty with concentrating, remembering, and word finding
Karnofsky Performance Scale	Perceived functional status (physical state and performance) for: <ul style="list-style-type: none"> • Just before surgery • At discharge • At current time (3, 6, or 12 mo)
Personal mastery	Perceived self-control
Caregiver competence	Perceived competency in caregiving role
Mutuality	Positive qualities of the patient-caregiver relationships (eg, love and affection, reciprocity)
Marital satisfaction	Perceived satisfaction with marital relationship
Expressive support	Extent of perceived support from friends and family (other than marital partner)
Caregiving Burden Scale	<ul style="list-style-type: none"> • Objective Burden: amount of caregiving demand (concrete direct and indirect caregiving tasks) • Subjective Burden: amount of perceived difficulty with caregiving tasks • Total Burden: a measure of the total objective and subjective burden perceived by the caregiver
Bakas Outcomes of Caregiving	Impact of the caregiving experience on life domains (eg, health, relationships, self-esteem)

CABG, Coronary artery bypass graft; SF-12, short-form health survey [12 items].

health status. These two items were chosen because this study drew on a spouse's perception of the patient's health status rather than that of the patient. Face, content, criterion, and construct validity of the SF-12 have been reported.⁵⁰⁻⁵² The KPS is often used as an estimate of a patient's physical state and performance, and thus allowed spouses to classify functional impairment of patients. The KPS uses a global rating scale from moribund (0) to normal (100); the lower the score, the worse the survival prospect for most serious illnesses.⁵³ In this study, spouses rated the patient's level of functioning at the following three time points: just before surgery, at discharge, and at the present time (3, 6, or 12 months). The first two time points relied on retrospective recall of the patient's functional status, whereas the last one reflected current perceived level of functioning. The KPS has high predictive validity but mixed results when tested for interrater reliability. Ceiling effects may occur, and it may be difficult to assess change over time.⁵⁴

Spouses then assessed recovery-related symptoms of difficulty with sleeping, concentrating, remembering, and word finding by standardized symptom scales. These symptoms were chosen as an adjunctive measure to the patient's health status because studies have shown higher burden for caregivers of the cognitively impaired compared with those of the physically disabled.^{18,20,29,31,55,56} For these scales, the spouse rated the patient's frequency of each symptom in the last month on a 6-point Likert scale, from not at all (1) to every day (6), as used in the Post-CABG study.⁴⁸ Although reliability had not been established, a Cronbach's alpha of .89 was calculated in this study. Because spouses rated the patient for each symptom at one point in time, it would be unexpected to find a correlation with symptoms at another measurement point. The reliability of this method of evaluation is supported by the findings of Bergh and colleagues,⁵⁷ who asked married patients who have undergone CABG and angioplasty, and spouses to

rate their memory, concentration, general health, social functioning, and emotional state at 1 to 2 years postprocedure. Spouse ratings did not differ significantly from patient ratings on any domain.

Caregiver characteristics. The Pearlin Mastery Scale was used to measure personal self-control. The scale contains seven items that are rated on a 7-point Likert scale from strongly disagree (1) to strongly agree (7). Mastery scores range from low (7) to high (49) and are obtained by adding all item responses. The scale has been subjected to confirmatory factor analysis, and test–retest reliability coefficients of .44 have been reported.⁵⁸ A Cronbach's alpha of .80 was found in this study. The Caregiver Competence Scale⁵⁸ assesses the degree that individuals ascribe ratings of competency in their caregiving role. The scale consists of four items that are rated on a 4-point Likert scale ranging from not at all (1) to very much (4). Possible scores range from low (4) to high (16) and are obtained by adding the responses to all four items. Evidence of its internal consistency was demonstrated in this study with a Cronbach's alpha of .75, similar to Pearlin et al's⁵⁸ coefficient of .74.

Relationship characteristics. The Mutuality Scale is a 15-item tool that measures positive qualities of the patient–caregiver relationship including love and affection, shared values and pleasurable activities, and reciprocity. Caregivers rated these items on a 5-point Likert scale from none (0) to a great deal (4). Scores range from low (0) to high (60). Predictive validity and a Cronbach's alpha of .91 have been reported⁵⁹; an alpha coefficient of .96 was found in this study. As a unidimensional scale, the Kansas Marital Satisfaction Scale measures marital satisfaction on a 7-point Likert scale. On this three-item tool, spouses rated their level of satisfaction with their marriage, their relationship with their husband or wife, and their husband or wife as a spouse at the present time, as well as retrospectively at the time of their spouse's surgery. Scores range from low (3) to high (21).⁶⁰ The Kansas Marital Satisfaction Scale has content, criterion, construct, and factor validity. Construct validity has been shown through correlations with a variety of related, but not equivalent measures of marital quality, such as cohesion (.42), empathy (.44–.53), emotional intimacy (.32–.77), relationship rewards (.61–.72), communication (.29–.67), and conflict resolution (.20–.65). The tool has internal consistency with coefficients ranging from .74 to .98,⁶¹ a Cronbach's alpha of .85 was found in this study. The Expressive Support Scale measures the extent of perceived

support from friends and family (other than their marital partner) with respect to their caregiving role. This scale has eight items that spouses rated on a 4-point Likert scale from strongly disagree (1) to strongly agree (4). Scores range from low (8) to high (32) and are obtained by adding the responses to all eight items. Internal consistency has been reported with a Cronbach's alpha of .87,⁵⁸ and .93 in the present study.

Data analysis

Data were entered and analyzed with the Statistical Package for the Social Sciences Version 11 (SPSS Inc, Chicago, Ill). Procedures for handling missing values for each instrument were followed when available; when unavailable, a standard of 20% missing values was set as the cutoff for calculating item means (and overall scores) for the instrument. For missing values, the mean of the items present was multiplied by the total number of items on the scale and then divided by the number of items present to determine the score to be inserted for the missing value. After the data were analyzed for normality, descriptive statistics were used to describe the sample, including demographics, patient health status (by spouse proxy ratings), caregiver burden, OOC, and other caregiving variables of the three groups. On the basis of normality of data, appropriate tests of difference were selected to compare these variables between spouse groups at the three time intervals (analysis of variance or Kruskal-Wallis) and gender (*t* tests or Mann-Whitney *U*). Cronbach's alpha was included to provide evidence of instrument reliability and validity.

RESEARCH FINDINGS

Description of the sample

The total sample comprised 166 spouses, representing an overall response rate of 36%. The 3, 6, and 12-month groups comprised 57 (57/166, 34% response), 55 (55/155, 35% response), and 54 (54/138, 39% response) caregivers, respectively. Characteristics of the patients who had undergone CABG surgery and their spouses were compared by both group and gender. Tables II and III present the characteristics of patient/spouse dyads in the 3, 6, and 12-month groups. Patients who had undergone CABG surgery were elderly (mean 66.8 years, standard deviation [SD] 9.6) and male (81.9%). Patient gender was the only demographic variable that differed significantly by groups, with fewer female patients in the 6-month group. Spouse ratings of pa-

Table II
Characteristics of the patient sample

Patient characteristics	3-month group (n = 57)		6-month group (n = 55)		12-month group (n = 54)		P value
	n	%	n	%	n	%	
Gender*							
Male	45	79	49	89	42	78	.001
Female	12	21	6	11	12	22	
	Mean	SD	Mean	SD	Mean	SD	
Age†	65.5	9.1	67.2	10.0	67.7	9.8	.48
SF-12 No. 1† Health status now	3.4	.88	3.4	.86	3.4	.89	.98
SF-12 No. 2† Health status at time of surgery	2.2	.97	2.3	1.2	2.5	1.1	.51
Symptoms: sleep†	3.4	1.8	2.9	1.6	3.4	1.6	.30
	Median	Range	Median	Range	Median	Range	
KPS: just before surgery‡	80	20–100	80	20–100	80	50–100	.82
KPS: at discharge‡	60	20–90	60	40–100	60	40–90	.76
KPS: 3, 6, or 12 mo‡	90	50–100	90	50–100	90	60–100	.36
Symptoms: composite‡	1.7	1–5	1.8	1–6	2.3	1–6	.25

SD, Standard deviation; SF-12, short-form health survey [12 items]; KPS, Karnofsky Performance Scale.

*Chi-square test.

†Analysis of variance.

‡Kruskal-Wallis.

tients on the SF-12 health status, KPS, and symptom scales did not differ significantly by group. Overall, spouses rated patients' current health status as good, compared with fair at the time of surgery. Yet, as shown in Table II, spouse caregivers gave female patients significantly lower health status ratings (recalled) at the time of surgery ($P = .05$), and reported more current sleep symptoms ($P = .002$) and lower functional status scores for patients in all groups ($P = .03$ – $.05$) compared with males. These findings suggest (according to spouses) that female patients had a lower health and functional status before CABG surgery, at discharge, and after surgery (3, 6, and 12 months) (Table IV).

In terms of spouse caregivers, significant differences were found in all of the demographic characteristics (except age) between the groups (Table III). Most of these differences were between the 6-month versus the 3 and 12-month groups; the 6-month group had no ethnic minorities (0%), fewer males (10.9%), and more college-educated (64%) and retired caregivers (60%) with moderate income

levels (26%). Despite these differences, no group differences were found in the variables that may be associated with burden (Table III). In general, spouses reported moderate personal mastery (mean 34.7, SD 8) and high caregiver competence (median 15, range 7–16) in all groups. High levels of mutuality (median 51, range 5–60), marital satisfaction (median 18, range 3–21), and social support (median 28, range 8–32) existed for all spouses. One gender difference in these variables was found; male caregivers reported higher marital satisfaction (median 19, range 9–21) than females (median 18, range 3–21) ($P = .04$) (Table V).

Hypothesis 1: Caregiver burden by cross-sectional group

No significant differences were found for total, objective, or subjective burden scores among the three groups (Table VI). Total burden was low to moderate in all groups. Of the two components, objective burden (caregiving demand) was the highest, as caregivers in all groups reported low subject-

Table III
Characteristics of the spouse caregiver sample

Caregiver characteristics	3-month group (n = 57)		6-month group (n = 55)		12-month group (n = 54)		P value
	Mean	SD	Mean	SD	Mean	SD	
Age†	63.9	10.4	65.0	10.6	65.4	10.2	.73
	n	%	n	%	n	%	
Gender*							
Male	12	21.1	6	10.9	12	22.2	.001
Female	45	78.9	49	89.1	42	77.8	
Educational level*							
<9th grade	3	5.3	1	1.8	2	3.7	.001
No diploma (9–12)	3	5.3	0	0	3	5.6	
High school graduate	18	31.6	19	34.5	17	31.5	
Some college/Associate in Arts	11	19.3	20	36.4	15	27.8	
Bachelors+	21	36.8	15	27.3	16	29.6	
Missing	1	1.8	0	0	1	1.9	
Employment*							
Full-time	19	33.3	13	23.6	13	24.1	.001
Part-time	6	10.5	3	5.5	1	1.9	
Homemaker	7	12.3	5	9.1	8	14.8	
Retired	23	40.4	33	60.0	29	53.7	
Other	1	1.8	1	1.8	2	3.7	
Missing	1	1.8	0	0	1	1.9	
Family income*							
<\$24,999	7	12.5	5	9.3	4	7.4	.01
\$25–\$39,999	9	16.1	10	18.5	21	38.9	
\$40–\$54,999	7	12.5	14	25.9	5	9.3	
\$55–\$74,999	8	14.3	11	20.4	7	13.0	
>\$75	18	32.1	10	18.5	10	18.5	
Missing	7	12.5	4	7.4	7	13.0	
Ethnicity*							
White	56	98.2	55	100	53	98.1	.001
Hispanic	0	0	0	0	1	1.9	
Asian/Pacific Islander	1	1.8	0	0	0	0	
American Indian/Alaskan Native	0	0	0	0	0	0	
Black or African American	0	0	0	0	0	0	
Years married*							
1–5	5	8.8	0	0	1	1.9	.001
6–10	2	3.5	1	1.8	0	0	
11–20	7	12.3	8	14.5	5	9.3	
21–30	3	5.3	6	10.9	7	13.0	
>30	40	70.2	40	72.7	41	75.9	
	Mean	SD	Mean	SD	Mean	SD	
Personal mastery†	35.0	8.2	35.0	8.4	34.0	7.4	.74
	Median	Range	Median	Range	Median	Range	
Caregiver competence‡	15.0	9–16	15.0	7–16	14.5	10–16	.48
Mutuality‡	51.0	21–60	51.0	5–60	52.0	21–60	.67
Marital satisfaction‡	18.0	3–21	18.0	3–21	18.0	11–21	.58
Expressive support‡	28.5	13–32	27.5	11–32	26.5	8–32	.17

SD, Standard deviation.

*Chi-square test.

†Analysis of variance.

‡Kruskal-Wallis.

Table IV
Characteristics of patients by gender

Patient characteristics	Male (n = 136)		Female (n = 30)		P value
	Mean	SD	Mean	SD	
Age*	66.7	9.7	67.2	9.3	.81
SF-12 No. 1 Health status now*	3.5	.86	3.1	.88	.07
SF-12 No. 2 Health status at time of surgery*	2.4	1.1	2.0	.98	.05
Symptoms: sleep*	3.0	1.7	4.1	1.4	.002
	Median (Mean)	Range	Median (Mean)	Range	
KPS: just before surgery†	80 (79)	20–100	80 (73)	20–100	.03
KPS: at discharge†	60 (62)	40–100	50 (56)	20–90	.05
KPS: 3, 6, or 12 mo†	90 (90)	50–100	90 (85)	50–100	.05
Symptoms: composite†	2	1–6	2	1–5	.91

SD, Standard deviation; SF-12, short-form health survey [12 items]; KPS, Karnofsky Performance Scale.

**t* test.

†Mann-Whitney *U* test.

tive burden (caregiving difficulty). Of the 15 caregiving tasks, four activities demanded a moderate degree of caregiver time (mean rating ≥ 3) at each time point (Table VII), including (1) providing emotional support; (2) monitoring symptoms; (3) providing or arranging transportation; and (4) performing additional household tasks. In terms of caregiving difficulty (Table VIII), only managing behavior problems was perceived to be a slightly difficult task in each group (mean rating ≥ 2). However, spouses in the 12-month group also reported that providing emotional support was slightly difficult. All of the other tasks were perceived to be not difficult (mean rating < 2) by spouses in all three groups. There were no group differences with respect to the demand or difficulty of any caregiving activity ($P \geq .05$) (Tables VII and VIII). Highlighting the top time-consuming and most difficult caregiving tasks in all groups, Table IX shows that providing emotional support and transportation were the two top time-demanding tasks (objective), whereas managing behavior problems and providing emotional support were the two top difficult tasks (subjective).

Hypothesis 2: Caregiver burden by gender

Total burden was significantly higher in male (mean 33.1, SD 9.4) versus female caregivers (mean 29.4, SD 8.5) in the total sample ($P = .05$). Objective ($P = .11$)

and subjective burden ($P = .20$) scores were also higher among all male caregivers, although these differences were not significant. Table X shows the objective, subjective, and total burden scores for male and female caregivers by group. Further statistical analysis of these data was precluded by the small number of men in each group. Examination of caregiving tasks showed that male caregivers spent more time and had more difficulty with five tasks (data not shown). These tasks included medical or nursing treatments ($P = .02$ objective; .04 subjective), personal care ($P = .01$ objective; .004 subjective), assistance with mobility ($P = .001$ objective and subjective), arranging care while away ($P = .01$ objective), and monitoring symptoms ($P = .01$ subjective).

Hypothesis 3: Outcomes of caregiving by cross-sectional group

The BCOS (total score) was moderate in the overall sample (mean 62.8, SD 10.8). No differences were found in the OOC total scores by group ($P \geq .05$) (Table XI). Two caregiving outcomes (individual items), future outlook and social activities with friends, were significantly different between groups. In a post hoc multiple comparisons analysis, using the Bonferroni planned contrast method, spouses at 6 months reported their future outlook and social activities had "changed slightly for the worst" compared with the 12-month, and 3 and 12-month

Table V

Characteristics of spouse caregivers by gender

Caregiver characteristics	Male (n = 30)		Female (n = 136)		
	Mean	SD	Mean	SD	
Age*	69.0	10.0	63.8	10.3	.01
	n	%	n	%	
Educational level†					
<9th grade	3	10.0	3	2.2	.001
No diploma (9–12)	3	10.0	3	2.2	
High school graduate	6	20.0	48	35.3	
Some college/Associate in Arts	10	33.3	36	26.5	
Bachelors or above	7	23.3	45	33.1	
Missing	1	3.3	1	.7	
Employment†					
Full-time	6	20.0	39	28.7	
Part-time	0	0	10	7.4	.001
Homemaker	0	0	20	14.7	
Retired	22	73.3	63	46.3	
Other	1	3.3	3	2.2	
Missing	1	3.3	1	.7	
Family income†					
<\$24,999	6	20.0	10	7.5	.001
\$25–\$39,999	10	33.3	30	22.4	
\$40–\$54,999	2	6.7	24	17.9	
\$55–\$74,999	3	10.0	23	17.2	
>\$75	5	16.7	33	24.6	
Missing	4	13.3	14	10.4	
Ethnicity†					
White	29	96.7	135	99.3	
Hispanic	0	0	1	.7	.01
Asian/Pacific Islander	1	3.3	0	0	
American Indian/Alaskan Native	0	0	0	0	
Black or African American	0	0	0	0	
Years married†					
1–5	0	0	6	4.4	.001
6–10	0	0	3	2.2	
11–20	3	10.0	17	12.5	
21–30	2	6.7	14	10.3	
>30	25	83.3	96	70.6	
	Mean	SD	Mean	SD	
Personal mastery*	33.4	7.3	35.0	8.1	.35
	Median	Range	Median	Range	
Caregiver competence‡	14.0	9–16	15.0	7–16	.24
Mutuality‡	54	33–60	51	5–60	.07
Marital satisfaction‡	19	9–21	18	3–21	.04
Expressive support‡	26	8–32	28	11–32	.27

SD, Standard deviation.

*T test.

†Chi-square test.

‡Mann-Whitney U test.

Table VI
Caregiver burden scores by groups

Caregiver burden	3-month group (n = 57)		6-month group (n = 55)		12-month group (n = 54)		P value*
	Mean	SD	Mean	SD	Mean	SD	
Objective	38.0	10.1	38.4	10.8	36.7	10.5	.24
Subjective	23.1	9.6	22.9	9.3	23.8	10.2	.44
Total	29.9	8.5	30.1	8.7	30.3	9.4	.48

SD, Standard deviation.

*Analysis of variance (one-tailed).

Table VII
Spouse caregiver ratings of objective burden for caregiving tasks

Objective burden (amount of time: Likert 1-5)	3-month group (n = 57)		6-month group (n = 55)		12-month group (n = 54)		P value*
	Mean	SD	Mean	SD	Mean	SD	
1. Medical or nursing treatments	2.8	1.1	2.7	.97	2.8	1.0	.61
2. Personal care	2.4	.86	2.3	.89	2.4	1.1	.95
3. Assistance with mobility	2.4	.94	2.3	.91	2.3	1.0	.62
4. Emotional support	3.8	1.1	3.8	1.0	3.7	1.1	.88
5. Monitoring symptoms	3.2	1.0	3.0	1.0	3.0	1.2	.48
6. Providing transportation	3.5	1.2	3.5	1.1	3.2	1.1	.37
7. Managing finances	2.7	1.3	2.7	1.3	2.6	1.2	.86
8. Additional household tasks	3.1	1.3	3.1	1.2	3.0	1.0	.84
9. Tasks outside of home	2.8	1.1	3.0	1.2	2.5	1.1	.06
10. Structuring activities	2.6	1.1	2.6	1.1	2.4	1.0	.50
11. Managing behavior problems	2.2	1.1	2.5	1.2	2.4	.99	.40
12. Arranging care while away	1.6	.78	1.4	.60	1.5	.86	.53
13. Communication	1.6	.94	1.5	.91	1.5	.61	.44
14. Coordinating services	1.8	.84	2.1	.88	1.9	.76	.11
15. Seeking information	2.4	.86	2.5	.95	2.4	.88	.88

SD, Standard deviation.

*Kruskal-Wallis.

groups, respectively. In all three groups several outcomes “changed slightly for the best” (mean rating >4), including self-esteem, coping with stress, relationships with friends, future outlook, emotional well-being, roles in life, relationships with family and spouse, and physical functioning. In contrast, spouses perceived that many other areas of their life “did not change at all” (mean rating = 4), including general and physical health, family activities, and level of energy.

Only two outcomes “changed slightly for the worst” (mean rating <4): social activities with friends and financial well-being.

Hypothesis 4: Outcomes of caregiving by gender

BCOS scores were also examined by gender. Although OOC (total scores) were higher in male

Table VIII

Spouse caregiver ratings of subjective burden for caregiving tasks

Subjective burden (Difficulty: Likert 1–5)	3-month group (n = 57)		6-month group (n = 55)		12-month group (n = 54)		P value*
	Mean	SD	Mean	SD	Mean	SD	
1. Medical or nursing treatments	1.6	.87	1.5	.72	1.8	1.1	.57
2. Personal care	1.5	.76	1.4	.68	1.8	.99	.07
3. Assistance with mobility	1.6	.84	1.4	.63	1.6	.98	.82
4. Emotional support	1.8	1.0	1.7	.99	2.0	1.2	.47
5. Monitoring symptoms	1.7	.97	1.6	.88	1.7	1.0	.99
6. Providing transportation	1.6	.90	1.7	.97	1.7	1.0	.70
7. Managing finances	1.7	.87	1.7	1.1	1.6	.92	.94
8. Additional household tasks	1.8	1.0	1.9	1.1	1.9	1.1	.96
9. Tasks outside of home	1.5	.95	1.5	.75	1.6	.92	.80
10. Structuring activities	1.6	.89	1.5	.82	1.6	.95	.69
11. Managing behavior problems	2.0	1.2	2.0	1.2	2.0	1.2	.99
12. Arranging care while away	1.2	.48	1.3	.87	1.3	.82	.99
13. Communication	1.2	.55	1.2	.59	1.2	.56	.77
14. Coordinating services	1.3	.71	1.4	.86	1.4	.63	.82
15. Seeking information	1.4	.85	1.5	.85	1.5	.92	.98

SD, Standard deviation.

*Kruskal-Wallis.

(mean 67.4, SD 9.7) versus female caregivers (mean 61.8, SD 10.8), these differences were not significant ($P = .73$). Males reported significantly more positive OOC in the following eight areas: self-esteem, family activities, relationships with friends, future outlook, emotional well-being, roles in life, and their relationships with family, and spouse (Table XII).

DISCUSSION

Caregiver burden

The first hypothesis was not supported. No group differences were found for total, objective, or subjective burden, and thus caregiver burden was not lower at 12 months as hypothesized. Total burden was low for caregivers sampled at 3, 6, or 12 months. Of the two components of burden, objective burden was highest (but only moderately so) in all groups, whereas subjective burden was low. In all groups, providing emotional support and transportation were the two top demanding tasks. These findings are not surprising considering the substantial emotional component to recovery after CABG surgery and the need for caregivers to provide transportation to medical appointments and cardiac rehabilitation, especially while patients had driving restric-

tions during the early weeks and months after surgery. Although more study is necessary, it is possible that transportation remained demanding after the first 3 months for caregivers who were older or perhaps did not drive. Providing emotional support and managing behavior problems were the two most difficult tasks in all groups. Emotional adjustments and postoperative anxiety and depression are common after CABG surgery,³⁵ and caregivers may not be adequately prepared to provide this support or manage patient behavior problems that may be related to emotional or neurocognitive changes, or compliance with their health care regimen after surgery.

The degree of burden found in this study is similar to that found in other studies at 1 to 6 weeks,³ and at 1 and 3 months in this population.³⁷⁻³⁹ Rankin³⁸ found that the subjective burden of spouses of patients who underwent CABG was not significantly reduced at 12 months, consistent with findings of the present study. Collectively, these findings suggest that the CABG recovery trajectory is associated with a relatively flat and steady level of burden for spouse caregivers in the first year after surgery. The objective and subjective burden asso-

Table IX

Percentage of spouse caregivers reporting large or great amount of time or difficulty with caregiving tasks

Caregiving activity*	3-month group (n = 57)		6-month group (n = 55)		12-month group (n = 54)	
	Objective burden % reporting large or great amount of time spent	Subjective burden % reporting very or extremely difficult	Objective burden % reporting large or great amount of time spent	Subjective burden % reporting very or extremely difficult	Objective burden % reporting large or great amount of time spent	Subjective burden % reporting very or extremely difficult
Emotional support	61.4	8.9	58.2	7.3	60.4	13.0
Providing transportation	52.7	3.5	40.7	5.4	41.5	9.3
Additional household tasks	38.6	5.3	38.9	5.6	29.6	5.7
Monitoring symptoms	35.1	3.6	23.6	3.7	32.1	5.7
Managing finances and bills	28.1	3.6	27.2	7.2	20.7	3.8
Medical or nursing treatments	26.3	1.8	18.1	0	15.0	5.6
Tasks outside of home	24.6	3.5	25.0	0	18.9	4.0
Structuring and planning activities	17.6	3.6	20.8	1.9	13.2	4.0
Assistance with mobility	14.1	1.9	9.1	0	11.5	5.8
Seeking information	10.6	3.6	14.9	3.8	9.4	3.8
Managing behavior problems	10.5	12.5	20.7	15.4	11.5	15.7
Personal care	8.8	0	7.3	0	11.4	3.8
Communication	7.1	0	3.8	0	0	1.9
Coordinating and managing services	5.3	1.9	7.5	3.8	1.9	0
Arranging care while away	1.8	0	0	5.7	4.0	4.0

*Caregiving items ordered from most to least objective burden for the 3-month group.

ciated with the 15 caregiving tasks in the three groups provide evidence for continued caregiver work in the areas of monitoring, functional, support, and comfort work qualitatively validated in this population.⁵ It is possible that after the initial adjustment of learning the caregiving role in the early

postoperative period, the required tasks are not perceived as difficult by spouse caregivers as time goes on. Furthermore, the steady level of low subjective burden may reflect that it is not difficult to care for a spouse to whom the caregiver is committed (both mutuality and marital satisfaction levels

Table X

Caregiver burden scores by gender and group

	Male						Female					
	3-month group (n = 12)		6-month group (n = 6)		12-month group (n = 12)		3-month group (n = 45)		6-month group (n = 49)		12-month group (n = 42)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Objective	44.2	10.0	35.5	8.1	39.9	10.8	37.6	9.8	38.7	11.2	35.7	10.3
Subjective	27.2	11.1	19.0	6.4	28.6	14.0	22.0	9.0	23.4	9.5	22.4	8.6
Total	33.3	8.3	28.2	5.2	35.1	11.5	29.0	8.4	30.3	9.0	28.9	8.4

SD, Standard deviation.

Table XI

Outcomes of caregiving by group

Outcomes of caregiving	3-month group (n = 57)		6-month group (n = 55)		12-month group (n = 54)		P value*
	Mean	SD	Mean	SD	Mean	SD	
Total score	63.5	10.2	61.0	10.9	64.0	11.1	.30
Individual items:							
1. Self-esteem	4.6	.94	4.5	1.0	4.6	1.0	.95
2. Physical health	4.0	.87	3.9	.95	4.0	1.1	.98
3. Family activities	4.2	.87	3.8	1.1	4.1	1.1	.13
4. Coping with stress	4.3	1.1	4.5	1.1	4.7	1.0	.30
5. Relationship with friends	4.4	.94	4.1	.88	4.4	1.1	.18
6. Future outlook	4.4	1.1	3.8	1.2	4.6	1.3	.003
7. Level of energy	4.0	1.1	4.0	1.0	3.9	.99	.91
8. Emotional well-being	4.3	1.2	3.9	1.2	4.2	1.2	.20
9. Roles in life	4.5	.88	4.1	.99	4.4	1.1	.09
10. Social activities with friends	4.0	.98	3.5	.77	4.0	.97	.01
11. Relationship with family	4.6	.96	4.4	1.0	4.6	1.2	.36
12. Financial well-being	3.7	.95	3.6	1.1	4.0	1.1	.10
13. Relationship with spouse	4.8	1.1	4.6	1.4	4.8	1.3	.56
14. Physical functioning	4.0	.80	4.1	.76	4.0	.89	.63
15. General health	4.0	.91	4.0	.79	3.8	1.1	.51

SD, Standard deviation.

*Analysis of variance.

were high). Relatively high scores for other variables shown to mitigate burden were present. Caregivers in all groups reported a high sense of personal mastery and caregiver competence, indicating they felt capable and in control of the caregiving situation.

These relatively low steady levels of burden may also reflect the psychosocial illness trajectory of CAD.⁶² Although many patients undergoing CABG surgery have been coping with chronic CAD, the patient who has undergone CABG and the patient's

Table XII
Outcomes of caregiving by gender

Outcomes of caregiving	Male (n = 30)		Female (n = 136)		P value*
	Mean	SD	Mean	SD	
1. Self-esteem	4.9	1.1	4.5	.95	.02
2. Physical health	4.1	.96	3.9	.96	.54
3. Family activities	4.7	1.3	3.9	.93	.001
4. Coping with stress	4.8	1.0	4.4	1.1	.11
5. Relationship with friends	4.8	1.1	4.2	.93	.01
6. Future outlook	5.0	1.1	4.1	1.2	.001
7. Level of energy	4.2	1.1	3.9	1.0	.10
8. Emotional well-being	4.5	1.2	4.0	1.2	.04
9. Roles in life	4.8	1.1	4.2	.94	.004
10. Social activities with friends	3.9	.94	3.8	.93	.73
11. Relationship with family	5.1	1.2	4.4	1.0	.003
12. Financial well-being	3.6	.91	3.8	1.1	.59
13. Relationship with spouse	5.3	1.3	4.6	1.3	.01
14. Physical functioning	4.0	.94	4.1	.79	.85
15. General health	4.0	.93	3.9	.94	.76

SD, Standard deviation.

*T tests.

family generally have the hope that the patient's health and quality of life will significantly improve after surgery (as opposed to a population with chronic disease in whom progressive health deterioration is expected, eg, those with Parkinson's or dementia). Although this trajectory suggests that most of the burden of caregiving occurs in the first postoperative weeks after CABG surgery, the mean objective scores in a 1 to 6-week sample of CABG caregivers³ (mean 29.9, SD 11.1) were lower than at the 3 (mean 38.0, SD 10.1), 6 (mean 38.4, SD 10.8), or 12-month (mean 36.7, SD 10.5) time points measured in the present study. These differences may reflect the fact that Stolarik and colleagues³ sample was composed of family caregivers (not solely spouses). Longitudinal investigations are especially needed to identify how caregiver burden changes over the first-year trajectory for spouse caregivers because other investigators have found that burden increases in chronic conditions when caregiving extends over a prolonged period.³¹

Alternative explanations exist for the relatively low burden levels. First, the low burden levels may signal a floor effect. Burden levels may have been so low that it would be difficult to demonstrate further reductions. The CBS may also lack sensitivity to

detect changes in burden. Future research should validate the CBS with other burden instruments to demonstrate concurrent validity in the CABG population. Bias is another possibility for the low burden. Because a convenience sample was used, it is possible that only the relatively unburdened caregivers responded to the 24-page survey at any time point, causing sample bias. Therefore, the burden scores reported would reflect the relatively low burden for each group recruited and potentially mask any true differences that might exist. Social desirability might also have led to respondent bias because marital satisfaction was extremely high. It may not have been seen as desirable to report feeling burdened to provide care for someone to whom the caregiver was so highly committed. Finally, it may be that caregiving after CABG surgery is not that burdensome. Perhaps the measures used in this study did not tap the disruption that CABG surgery introduced into the lives of the patient who has undergone CABG and his or her spouse. Providing emotional support was one of the top time-consuming (objective) and difficult (subjective) caregiving activities in all three groups over the first year post-CABG surgery. These findings provide ev-

idence of the disruption that the CABG surgery event provokes for the couple.

The second hypothesis was supported. Gender differences in burden were found with men reporting higher total burden. Although men in this study also reported greater marital satisfaction, as did men in Rankin's³⁷ study, these high levels of marital satisfaction were not sufficient to mitigate total burden. In examining individual caregiving tasks, males reported more burden with medical or nursing treatments (objective and subjective), personal care (objective and subjective), mobility assistance (objective), arranging care (objective), and monitoring symptoms (subjective burden). Although male caregivers in this study had more total burden, other studies showed that female caregivers experienced more total, objective, and subjective burden.^{14,25,31,37} These findings may reflect not only the natural predisposition of women to be caregivers but also differences in societal and family role expectations, as well as skill sets, of male versus female caregivers. The differences found in this study may also have a generational component because 65 years was the mean caregiver age in all groups. In traditional gender roles, men have not been socialized or expected to fulfill caregiving roles. As a result, when a male caregiver's wife undergoes CABG surgery, caregiving activities may be new and/or more difficult for him, explaining the higher total burden. In addition to poorer health and functional status of the female patients who had undergone CABG surgery, other reasons that male caregivers had more total burden may be related to personal characteristics. Male caregivers in this study were older, less educated, and more likely to be retired and report poorer health, characteristics that might have affected capability or use of resources. Although these gender differences in burden and caregiving are interesting, further study is needed because few male caregivers were included in the total sample (N = 30).

Outcomes of caregiving

The third hypothesis was partially supported. Despite low-to-moderate levels of caregiver burden, OOC scores were only moderate. BCOS scores were not higher for the 12-month group compared with the 3 and 6-month groups. This finding may mirror the fact that caregiver burden scores were not less in the 12-month group compared with the other groups. The caregiving outcomes "future outlook" and "social activities with friends" "changed slightly for the worst" in the 6-month group compared with the 3 and 12-month groups. It may be that at 6

months, caregivers had been in their role long enough for it to affect their mental and relational aspects, whereas caregivers at 3 months had just started, and those at 12 months had more experience with the caregiving role and were managing it successfully. These outcomes warrant further longitudinal investigation.

The fourth hypothesis was not supported. Although men had higher total burden, they reported more positive outcomes in nine areas. These positive caregiving outcomes may be partially explained by the higher marital satisfaction and mutuality scores of male caregivers. It is possible that while experiencing burden, husbands enjoyed caring for their wives and fulfilling the "til death do us part" commitment of the marital relationship. Gilliss and Belza⁵ found positive consequences of caregiving after CABG surgery occurred when patients and caregivers became closer and grew in appreciation of one another as they survived the challenges of recovery. Thus, male caregivers in this study may have become engaged in the needs of their wives after CABG surgery, stretching themselves by meeting a challenge and learning new skills that broadened their roles and relationships, and enriched their self-esteem and emotional well-being and future outlook on life at the same time. Again, further study on OOC in this population is warranted given the small number of male caregivers included in this sample.

LIMITATIONS

The cross-sectional design with three groups is the first limitation. However, this investigation helped build knowledge on burden and OOC in the CABG population, a topic of which relatively little is known. Data regarding how much caregiving spouses were providing before surgery or any additional help caregivers received after CABG surgery were not obtained. It is possible that spouse caregivers received assistance from adult children, relatives, friends, or neighbors that might have lessened total, objective, and subjective burden. Reliance on a convenience (rather than a random) sample, and the low response rate, limits generalizability because it may not have been representative of the entire caregiver population. The possibility of sample selection bias with unburdened caregivers completing surveys must also be taken into account when interpreting the findings. However, although a low response rate may increase the chance for non-response bias, Asch et al⁶³ found no direct relationship between response rate and bias. Study mea-

asures drew on the spouses' perceptions of the patients' health status. Although patients' own objective or self-report measures of health were not obtained, the measurement approach by proxy could be viewed as a better fit with the conceptual underpinnings related to stress and appraisal of the caregiving experience. Indeed, caregiver burden may relate to perceptions of the patients' health status and consequential care needs.

IMPLICATIONS FOR PRACTICE

Nurses play a vital role in educating and preparing patients and spouses for home recovery after CABG surgery, beginning with preparatory discharge information taught in the preoperative phase and extended to the discharge phase and beyond. Spouses need information that outlines the recovery process to reduce fear, anxiety, and uncertainty associated with caregiving. Ensuring preparedness for caregiving can reduce both objective and subjective burden⁵⁹ despite the caregiver's gender or relationship, or the patient's cognitive/functional impairment and amount of direct care needed.

Discharge instructions that outline realistic expectations for the patient and caregiver are essential to ensure they have adequate preparation about caregiving demands and difficulties after discharge. Essential components of caregiving preparation include an overview of the expected recovery course, including a description of the care these patients typically need and what tends to be most difficult for male and female spouse caregivers. Because our findings reflected that male caregivers had more total burden, it is essential that caregiver preparation is individualized to not only the baseline skills of caregivers but also documented recovery trajectories of male and female patients. Because of traditional gender roles, some of the care these patients may need after surgery, such as monitoring sternal or leg incisions or assistance with bathing or getting out of bed, may not be skills that male caregivers had before the surgical event. In addition, as documented in multiple studies,⁴¹⁻⁴⁸ male caregivers also need to be informed that the recovery of female patients is often different because of their advanced age, multiple comorbidities, and generally more advanced heart disease at the time of CABG surgery. By learning what to expect, spouses can be given assistance with skills they need to learn and on how and when to ask for caregiving assistance from their support networks.

AREAS FOR FUTURE RESEARCH

The first recommendation for future studies is the need for carefully defined sampling criteria. Historically, selection of caregivers has been based on patient (eg, diagnosis or surgery) or caregiver (eg, self-designated or number of tasks performed) characteristics. In the present study, spouses were assumed to be the primary caregiver after CABG surgery. Future studies should define a primary caregiver that is appropriate to the research question, such as the number or duration of tasks performed, or the minimum degree of involvement needed to be considered a caregiver. The addition of these criteria to future studies would add uniformity to the definition of caregiving and maximize generalizability.⁶⁴

In addition, CABG caregiver studies need to study burden and OOC over time. The present study was cross-sectional and thus provides "snapshots" of burden and caregiving outcomes. Longitudinal assessments will more fully illustrate the experience of burden after CABG surgery at intervals from baseline such as 1, 3, 6, and 12 months to discern how caregiving affects both patient and caregiver outcomes. Such studies would define common trajectories of caregiving in this population, highlighting differences in various age, gender, or ethnic groups, as well as changes in burden as heart disease progresses or resources and support change. These assessments are especially relevant for older patients undergoing CABG surgery who have elderly caregivers. Age has been shown to be a significant correlate of burden in both CABG³ and other populations^{64,65} and thus warrants investigation. As a result, programs that provide formal caregiver follow-up at designated times after discharge need testing, such as follow-up with cardiac professionals (in-person or by phone). The impact of such follow-up could be assessed through quality of life outcomes, patient and caregiver satisfaction, and patient recovery outcome measures.

CONCLUSION

This study investigated burden of spouses after CABG surgery. Total, objective, and subjective burden outcomes were not lower in the 12-month group as expected, nor were BCOS scores more positive, attesting to a steady caregiving demand in the first year after CABG surgery. Male caregivers had higher total burden but more positive OOC. The implications of these findings are that spouse caregivers need to be adequately prepared for an extended caregiving course, including the objective

and subjective demands after discharge, possibly tailored to gender. More longitudinal research is needed to fully understand how caregiver burden changes over time for spouse caregivers in the first year trajectory, as well as how the positive and negative aspects of caregiving affect the recovery outcomes of the patient who has undergone CABG. Studies of this nature will lay the groundwork for interventional programs to support patients who have undergone CABG and their spouses.

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