

SURVEY REPORT

Survey Results: A Decade of Change in Professional Life in Cardiology

A 2008 Report of the ACC Women in Cardiology Council*

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The findings and conclusions in this report are those of the Writing Committee and do not necessarily reflect the official position of the American College of Cardiology Foundation.

TABLE OF CONTENTS

Abstract	2216
Objectives	2216
Methods	2216
Results	2216
Conclusions	2216
Introduction	2216
Methods	2217
Statistical Analysis	2217
Results	2217
Practice Setting	2217
Mentoring	2218
Personal and Family Issues	2218
Radiation Concerns	2220
Negotiating	2220
Career Satisfaction	2221
Discrimination	2222
ACC Participation	2222
Discussion	2222
Practice Setting and Work Hours	2223
Personal and Family Issues	2223
Career Satisfaction and Advancement	2224
Radiation Risks	2224

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Discrimination	2225
Mentoring	2225
Conclusions	2225
Appendix	2225
References	2226

Abstract

Objectives

To meet the workforce needs in cardiology today, a thorough understanding of the factors affecting subspecialty choices of men and women is needed. This study was designed to examine the association between career decisions of women and men in cardiology and their satisfaction with personal and professional life and to determine how such associations may have changed in the past 10 years since the last American College of Cardiology (ACC) survey.

Methods

The Women in Cardiology Section of the ACC refined their 1996 questionnaire to host it online. In 2006, requests were e-mailed to all 1,901 female ACC members and an age-matched sample of 2,360 male members.

Results

A higher percentage of women than men are practicing in an academic setting. Also, women are more likely to describe their primary or secondary roles as noninvasive cardiologists (33% vs. 21%) and more men as interventional cardiologists (29% vs. 11%). These proportions have not changed in the past 10 years. Today, a similar proportion of women and men are working less than full-time (80% vs. 82%). More women than men have interrupted their training or practice (35% to 44% vs. 23% to 24%, $p < 0.01$), and while most interruptions for women were for pregnancy or delivery, approximately one third of the 66% of women with children did not take more than 1 month additional leave. Women continue to feel that family responsibilities have a negative effect on their ability to work (40% vs. 22%) and advance professionally (36% vs. 17%). Female cardiologists were less likely to be married (73% vs. 91%, $p < 0.001$), and this has not changed. Today, an increasing number of both men and women have additional caregiver duties, predominantly for elderly parents (16% to 18%). Both women and men were equally highly satisfied with their careers in general but unequally satisfied with their financial compensation (63% vs. 72%, $p = 0.007$), which was more pronounced in the academic setting. Mentors had an increasingly positive role on careers for both sexes (86% vs. 92%). Unfortunately, discrimination still affects the majority of

women in cardiology (69% vs. 22% of men, $p < 0.0001$) and has not changed in 10 years.

Conclusions

The number of female cardiologists and fellows has nearly doubled in the past decade since our last survey. Coincident with this, we have seen an increased emphasis upon and fulfillment from mentors, increased flexibility in work hours, and a universally high level of satisfaction with career and family. Discrimination based on gender and parenting is still prevalent. Female cardiologists remain less likely to be married or to have children. Tracking and elucidating the effects of the societal shifts in attitudes towards career, family, and work-life balance on the cardiology workforce can guide the field of cardiology to make the changes necessary to fill its workforce needs with the best possible candidates.

Introduction

Concerns about a growing shortage of cardiologists in the United States led the ACC to convene a Bethesda Conference in 2003 to address the underlying issues. One of the chief areas of concern was the continued under-representation of women in cardiology; despite statistics that show nearly equal numbers of men and women graduate from medical schools, sharply lower numbers of women select cardiovascular training. One of the resolutions emerging from the Bethesda Conference was to encourage more women to enter the field of cardiology (1).

According to the Accreditation Council for Graduate Medical Education database, as of August 2004, the total number of graduate medical and surgical trainees was 101,291, of whom 42% were women. There were 21,332 residents in internal medicine and 2,119 fellows in cardiology of which women comprise 42% and 18%, respectively. Women trainees are even less well represented in the subspecialties of electrophysiology (11.3%) and interventional cardiology (8.7%). The only other internal medicine subspecialty training programs that have comparably low participation by women are pulmonary medicine (21.4%), critical care (21.5%), and gastroenterology (25.3%); these levels are similar to those found in general surgery (26.7%) (2). To devise and implement effective strategies to positively impact the career decisions of both men and women, current and detailed information on professional issues confronting practicing cardiologists is needed.

In 1996, the Committee on Women in Cardiology (WIC) of the ACC sponsored a survey designed to assess the professional experience of cardiologists. The survey focused on how career decisions affected the personal and professional lives of male and female cardiologists and recommended developing new paradigms for the future training, education, and support of cardiologists (3). The current research, which was conducted between September 2005 and January 2006, was designed as a follow-up study with 3 specific goals: 1) to describe the relationship between personal and professional life and the career deci-

sions of U.S. cardiologists in academic and private practice; 2) to examine what differences may exist between men and women in cardiology; and 3) to determine how these parameters may have changed for cardiologists over the past 10 years.

Methods

The 1996 survey questionnaire was replicated verbatim so as to accurately compare the results of the 1996 study with responses from a contemporary sample of cardiologists. In addition, more detailed data were sought within a few specific questions. The 2006 questionnaire was hosted on a web server and accessed online via a link supplied in e-mail invitations. Invitations to participate were e-mailed to a total of 4,261 ACC members, including all 1,901 women members, and an age-matched sample of 2,360 male ACC members. Seven hundred thirteen e-mails were returned as undeliverable; consequently, the base of the actual sample became 3,545 (1,595 women and 1,950 men).

Between September and October 2005, each member of the sample was sent an e-mail invitation, and up to 4 follow-up “reminder” invitations were sent to those who had yet to complete a questionnaire. Wishing to increase response rates, the Committee reopened data collection between December 2005 and January 2006.

Statistical Analysis

Replicating the methods used in the 1996 predecessor study, chi-square tests were used to compare differences in responses by women and men, and $p < 0.01$ was established as the threshold for statistical significance. Because only the percentages and not the absolute numbers from the original 1996 dataset were available, formal statistical comparisons with the earlier results were not possible. The 1996 percentage responses are presented in table form with the current responses for completeness and visual comparison.

Results

At the close of data collection, 1,118 individuals had completed the survey questionnaire. Eight records were subsequently observed to be irregular and were eliminated prior to analysis. In all, 1,110 records were used for analysis:

667 (60%) female and 443 (40%) male, with an overall response rate of 31% (42% for females, 23% for males). This compares with a response rate of 49% in 1996 (54% female, 46% male). The age distribution between respondents and nonrespondents was similar; the age distribution between the sexes was similar except that there were fewer women over age 60 compared with men (8% vs. 15%) (Table 1).

Practice Setting

Greater percentages of women compared to men were pediatric cardiologists (15% vs. 6%), and smaller percentages were adult cardiologists (78% vs. 89%) or cardiovascular surgeons (1% vs. 2%) (all $ps < 0.0001$). More women than men considered medical school or university faculty as the best description of their practice (49% vs. 30%), and accordingly, fewer women considered private practice their primary practice setting (35% vs. 56%, $p < 0.0001$). The most common type of private practice setting described for both sexes was a single-specialty group practice (67% vs. 71%, $p = NS$) (Table 2).

Fewer women than men defined their primary or secondary role as an interventional cardiologist (11% vs. 29%) or an administrator (5% vs. 9%). Conversely, more women defined themselves as an echocardiographer (33% vs. 21%) or a transplant cardiologist (5% vs. 2%, $p < 0.01$) (Table 2).

In 2006, a similar proportion of women and men defined their work hours as full-time (80% vs. 82%) or as part-time (9% vs. 6%) (Table 2). Women were more likely than men to have interrupted both their training or practice for longer than 1 month during training (35% vs. 24%, $p < 0.01$) or during practice (46% vs. 23%, $p < 0.01$) (Table 3). There was a trend toward more prolonged interruptions of training for men than women (for 12 to 24 months: 12% of men and 8% of women; for greater than 24 months: 5% of men and 2% of women). In practice, a few men and women had prolonged (12 to 24 months) interruptions (3% and 4%, respectively). For women, the most common reasons given were pregnancy (14% training, 9% practice) and childbirth (44% training, 52% practice). For men “other” conditions were the most common reported reasons for interrupting training (73%) or practice (48%), followed by vacation (16% training, 11% practice), illness (2% training, 16% practice), and to make long-term career decisions (8% training, 14% practice).

Table 1. Age Distribution of Survey Respondents and Nonrespondents

Age (yrs)	2006				1996			
	Respondents		Nonrespondents		Respondents		Nonrespondents	
	Women, % (n = 667)	Men, % (n = 442)	Women, % (n = 928)	Men, % (n = 1,508)	Women, % (n = 518)	Men, % (n = 546)	Women, % (n = 450)	Men, % (n = 757)
Less than 40	21	18	24	23	30	38	27	32
40 to 49	42	37	40	36	50	37	54	38
50 to 59	30	30	30	30	14	14	15	21
60 or above	8	15	10	16	6	11	5	10

Table 2. Practice Settings of Respondents

Category	2006		1996	
	Women, % (n = 667)	Men, % (n = 442)	Women, % (n = 518)	Men, % (n = 546)
Cardiology type				
Pediatric cardiology	15	6	17	7
Adult cardiology	78	89	81	90
Cardiovascular surgeons	1	2	2	2
Practice setting				
University/medical school	49*	30	37	21
Private practice	35*	56	53	73
Single specialty practice	67	71	51	61
Solo practice	16	15	20	16
HMO	2	1	8	2
Not practicing/other	16	13	4	15
Full- and part-time practice				
Full-time practice	80	82	86	95
Part-time practice	9	6	8	3
Not practicing/other	2*/9	6/6	6	1
Primary/secondary role†				
Clinical cardiologist	40/30	46/34	79	58
Echocardiographer	11‡/22	5/16	31	19
Researcher	7/9	5/8	13	8
Interventional cardiologist	9‡/2	24/5	10	27
Diagnostic inv. cardiologist	5/6	5/9	18	41
Transplant cardiologist	4‡/1	1/1	5	2
Electrophysiology	7/2	6/2	9	9
Administrative	1/4	2/7	5	5

*p < 0.001 for women compared with men in 2006. †Respondents designated one primary and one secondary role, so total percentages do not equal 100%. ‡p < 0.01 for women compared with men in 2006.
HMO = health maintenance organization; inv. = invasive.

Mentoring

Women and men were equally likely to identify a mentor during subspecialty training (70% vs. 73%) (Table 4). Women were more likely to have female mentors (18% vs. 2%, p < 0.0001). Women and men both reported that their mentor had a positive or highly positive influence through introductions in the field (78% vs. 75%), participating in research (73% for both), career encouragement (82% vs. 83%) and planning (64% vs. 63%), as well as connections for job placements (51% vs. 47%). Although the majority of both women and men thought their mentors served as positive role models for career activities (86% vs. 92%), dramatically fewer women (41%) or men (38%) thought their mentors served as positive role models or advisors for noncareer issues such as family and lifestyle. Furthermore, women more commonly noted that their mentor was actually a negative influence as a personal role model (14% vs. 8%, p = 0.007).

Personal and Family Issues

In the current survey, the majority of respondents were married, but women were much less likely than men to be married (73% vs. 91%, p < 0.001) (Table 3). Three percent of women and less than 1% of men were living with a partner (p = 0.002). Fifteen percent of women and 5% of

men were single (p < 0.0001), and a similar number were divorced (6% vs. 5%, p = 0.03). The racial or ethnic group distribution was similar for men and women, with 76% of all respondents designating themselves white, 2% black, 4% Hispanic, 14% Asian, and 3% other.

The majority of male respondents had children (92%), which was significantly greater than the number of women with children (66%, p < 0.001). Men tended to have more children than women, with 76% of women having 1 to 2 children (24% having 3 or more children), and 45% of men having 3 or more children. The average age for women at the time of their first child was 32 years (range 15 to 47 years) and 31 years for men (range 19 to 49 years), and at the last child 36 years for women (range 22 to 55 years) and 35 years for men (range 21 to 50 years).

With regard to childcare, the expected large difference between men and female cardiologists who had spouses providing all of the childcare was identified (9% vs. 66%, p < 0.001) (Table 3). Accordingly, more women compared with men utilized a variety of childcare options and combinations: paid live-in full-time (29% vs. 10%), paid full-time caregiver coming to the home (38% vs. 8%), paid part-time caregiver coming to the home (25% vs. 17%), out-of-home private care (12% vs. 5%), institutional (day-

Table 3. Personal and Family Matters

Survey Item	2006		1996	
	Women, % (n = 667)	Men, % (n = 442)	Women, % (n = 518)	Men, % (n = 546)
Marital status				
Married	73*	91	71	90
Living with partner	3†	<1	1	<1
Single	15*	5	19	4
Divorced	6	5	7	4
Children				
Have children	66*	92	63	88
1 to 2 children	76*	55		
3 children or more	24*	45		
Primary caregiver for person other than child	16	18	10	11
Childcare arrangements (n = 440) (n = 408) (n = 306) (n = 443)				
Spouses providing all of childcare	9*	66	8	55
Paid live-in full-time caregiver	29*	10	19	6
Paid full- or part-time caregiver in home	63*	25	47	17
Nonpaid relative	16*	3	8	11
Out-of-home private or institutional care	45†	21	22	8
Add childcare for nights/on-call duties	51	18	44	11
Family leave policy				
No official policy	12	21	27	30
Not familiar with terms of policy	28	32	26	29
Moderately or very satisfied	29	31	22	21
Moderately or very dissatisfied	15	3	10	5
Interruption of training				
Never or less than 1 month	65†	77	70	80
1 to 2 months	14†	3	8	4
3 to 5 months	7†	1	5	1
6 to 11 months	4	3	2	1
12 or more months	10†	17	4	15
Interruption of practice				
Never or less than 1 month	56†	78	54	87
1 to 2 months	21†	8	24	6
3 to 5 months	14†	4	12	3
6 to 11 months	4	4	6	1
12 or more months	7	7	3	2

*p < 0.001 for women compared with men in 2006. †p < 0.01 for women compared with men in 2006.

care) (33% vs. 16%), which included onsite childcare facilities (7% vs. 2%), and nonpaid relative (16% vs. 3%) (all ps < 0.001). Similarly, substantially more women than men had additional childcare arrangements for nights/on-call duties (51% vs. 18%, p < 0.001).

As reflects changing family demands in the aging workforce, 18% of men and 16% of women reported having primary caregiver responsibility for a person other than their children. More female cardiologists felt that their family duties hindered their ability to do professional work “a lot or some” (40% vs. 22%), and fewer women than men thought the effect was “a little or not at all” (48% vs. 70%, p < 0.001). Similarly, more women noted that family responsibilities hindered their ability to travel for professional advancement “a lot or some” (45% vs. 30%) and fewer women described the effect as “a little or not at all” (43% vs.

63%, p < 0.001). In addition, more women noted that parenting and family responsibilities had a negative impact on their overall career advancement “a lot or some” (36% vs. 17%), and considerably fewer women than men described the impact as “not at all” (28% vs. 60%, p < 0.001). On the other hand, the majority of both women and men were “very satisfied” or “moderately satisfied” with their family life (81% vs. 88%).

With regards to family leave policy, more men than women reported that there was no official policy (21% vs. 12%, p < 0.001), and more women than men (15% vs. 3%) were moderately or very dissatisfied with the policy, but similar raw numbers (29% of women and 31% of men) were either moderately or very satisfied. Alternatively stated, of those who had a policy with which they were familiar (400 women, 206 men), 50% of women and 68% of men were

Table 4. Mentoring

Characteristic	2006		1996	
	Women, % (n = 667)	Men, % (n = 442)	Women, % (n = 518)	Men, % (n = 546)
Mentor present				
Had a mentor during subspecialty training	70	73	73	71
Mentor is a woman	18*	2	14	1
Mentor is a pediatric cardiologist	15*	6	17	1
Positive or highly positive influence				
Introductions in field	78	75	71	74
Participation in research	73	73	67	69
Career encouragement	82	83	83	84
Career role model	86	92	89	94
Noncareer role model	41	38	34	38
Career planning and decisions	64	63	44	62
Connections for job placements	51	47	54	45
Negative influence				
Noncareer role model	14†	8	19	8

*p < 0.001 for women compared with men in 2006. †p < 0.01 for women compared with men in 2006.

satisfied and 25% of women and 7% of men were dissatisfied with its content.

Radiation Concerns

Over 30% of all survey respondents (334 of 1,110) altered their training or practice focus to reduce the risk of occupational radiation exposure (Table 5). The majority (84%, 280 of 334) of these individuals were women. Of those 280 women, 58% (162 women) chose a career/training tract, and 43% (122 women) planned conception and/or pregnancy to reduce radiation exposure. Seventy-six percent of women obtained information on radiation risks during pregnancy, which is more than the 66% of women who had children. Women consulted medical texts (35%) more often than hospital policy (29%). Other sources that were consulted included other cardiologists (16%), radiologists (10%), and their obstetricians (13%).

Negotiating

Respondents were asked to rate a series of job features that they regarded as important at the time of their first job, and then again as if a job were being renegotiated at the time of the survey. For one's first job after training, the highest priority item was job description, being rated as "very important or important" by 93% of both women and men (Table 6). Women and men also rated the next priority items similarly, including benefits (65% vs. 64%), salary (62% vs. 63%), and time to promotion or advancement (57% vs. 58%). Women and men differed in their rating of work hours and vacation time, with more women rating these as "important or very important" (68% vs. 52%, p < 0.001, and 61% vs. 51%, p < 0.01, respectively).

However, the relative importance of negotiated items for "today's" jobs shifted significantly for both men and women. Salary, work hours, support staff, administrative responsi-

Table 5. Occupational Radiation Exposure

Response	2006		1996	
	Women, % (n = 667)	Men, % (n = 442)	Women, % (n = 518)	Men, % (n = 546)
Obtained information on risk of radiation exposure	76	69	81	...
Performed procedures with radiation risk while pregnant	30	N/A	...	N/A
Made alterations to reduce radiation exposure	42*	12	44	17
Types of alterations				
Chose career/training track with minimal radiation exposure	24*	5	23	8
Planned conception, pregnancy during times of nonradiation exposure	18*	2	21	2
Chose to not have children	1	0	2	<1

Ellipses indicate data were not recorded. N/A indicates not applicable. *p < 0.001 for women compared with men in 2006.

Table 6. Career Negotiation Factors

Response	2006		1996	
	Women, % (n = 667)	Men, % (n = 442)	Women, % (n = 518)	Men, % (n = 546)
Important in first job				
Salary	62	63	58	64
Benefits	65	64	61	63
Job description	93	93	87	88
Work hours	68*	52	60	49
Travel	25	24	25	23
Office/laboratory space	38	39	30	30
Support staff	56	56	50	49
Vacation time	61†	51	48	47
Time to promotion/partnership	57	58	51	60
Academic rank	43	37	40	32
Seniority	26	26	22	22
Administrative duties	29	29	23	20
Community recognition	37	32	27	26
Roles with national recognition	28	29	18	19
Important in job now				
Salary	93	96	96	96
Benefits	94	95	97	96
Job description	98	97	98	97
Work hours	92*	86	91	86
Travel	57	59	91	86
Office/laboratory space	72	65	73	67
Support staff	92	89	95	87
Vacation time	88	87	86	82
Time to promotion/partnership	75†	66	76	75
Academic rank	57*	45	55	40
Seniority	62	59	64	57
Administrative duties	63	58	62	45
Community recognition	56†	50	52	49
Roles with national recognition	47†	39	40	30

*p < 0.001 for women compared with men in 2006. †p < 0.01 for women compared with men in 2006.

bilities, space, seniority, and benefits increased in importance. Although both men and women exhibited this shift in priorities, when negotiating for jobs “today,” women placed more importance than men on work hours (92% vs. 86%, $p < 0.001$), time to promotion (75% vs. 66%, $p = 0.001$), academic rank (57% vs. 45%, $p < 0.001$), and roles with community or institutional recognition (56% vs. 50%, $p < 0.01$) and national recognition (47% vs. 39%, $p < 0.01$).

Career Satisfaction

Overall, both women and men were highly satisfied with their professional work, with 90% of women and 92% men reporting being moderately or very satisfied and few respondents reporting great dissatisfaction (<1%) (Table 7). Satisfaction rates were similar for women in academic and other practice settings and for both pediatric and adult cardiologists. Both women and men were generally satisfied with their financial compensation, although women were less so than men (63% vs. 72%, $p < 0.01$).

Both women and men in academic practice reported lower satisfaction with earnings than those in other

practice settings, with 29% of women reporting dissatisfaction with academic salaries compared with 18% of men ($p < 0.01$) (Table 7). Only 55% of academic women reported being moderately or very satisfied with their financial compensation compared with 74% of women in private practice, 61% of men in academics, or 78% of men in private practice.

Women were much more likely than men to feel that their level of advancement since completing training was lower or much lower than their contemporaries (29% vs. 10%, $p < 0.001$) and less likely to feel that their advancement was higher or much higher (22% vs. 45%, $p < 0.0001$). In addition, women expressed less satisfaction (75% vs. 84%, $p < 0.01$) and more dissatisfaction than men with their opportunity to achieve their professional goals (14% vs. 6%, $p < 0.001$). Nonetheless, both women and men were highly likely to recommend cardiology as a career choice (79% and 80%, $p = \text{NS}$), with only 8% of women and 6% of men stating they would discourage an advisee from entering cardiology as a career.

Table 7. Career Satisfaction

Satisfaction	2006		1996	
	Women, % (n = 667)	Men, % (n = 442)	Women, % (n = 518)	Men, % (n = 546)
Overall career satisfaction				
Moderately or very satisfied	90	92	80	92
Very dissatisfied	<1	<1	2	4
Recommend cardiology				
Strongly encourage	44	48	22	26
Encourage somewhat	35	32	33	35
With financial compensation				
Moderately or very satisfied	63*	72	65	70
Very dissatisfied	7*	4	3	7
In academic setting				
Moderately or very satisfied	55*	61	54	59
Moderately or very dissatisfied	29†	18	33	23
In other settings				
Moderately or very satisfied	74	78	71	72
Moderately or very dissatisfied	17	18	20	16
Level of advancement compared with contemporaries				
Higher/much higher	22†	45	26	52
Lower/much lower	29†	10	28	6

*p < 0.01 for women compared with men in 2006. †p < 0.001 for women compared with men in 2006.

Discrimination

The survey asked whether each respondent had “experienced any effects of discrimination during your career.” If the answer was “yes,” the respondent was asked to select the type of discrimination or to describe it in a space for free-form comments. Most women (69%) reported having experienced discrimination during their career compared with 22% of men ($p < 0.0001$). Women reported that the discrimination was because of gender (65% vs. 1% of men, $p < 0.0001$) or parenting responsibilities (27% vs. 1% of men, $p < 0.0001$). Men and women reported similar levels of discrimination from racial (10% of men vs. 9% of women) and religious reasons (8% of men vs. 4% of women). Yet, of the 96 men reporting discrimination, 71% (68 of 96) stated this was due to race or religion. Discrimination on the basis of sexual orientation was rare for both men and women (1% and 0%, respectively). Among those 458 respondents experiencing discrimination, women and men were equally likely to report that discrimination affected their ability to conduct professional activities with colleagues (45% vs. 39%), patients (14% vs. 17%), and within the ACC (9% vs. 9%). There were no questions that specifically addressed sexual harassment.

ACC Participation

Women and men were equally likely to have participated in the ACC Annual Scientific Session in the past 5 years (2000 to 2006) as an attendee (76% vs. 80%), abstract grader (12% vs. 13%), session moderator (13% vs. 12%), and invited speaker (11% vs. 12%) or panelist (10%). Also, compared with men, women respondents were equally likely to be a committee or task force member (14% vs. 14%) and a

member of ACC leadership, defined as an officer or member of the Board of Trustees or Board of Governors (3% vs. 5%). When looked at from the perspective of the total ACC membership of 32,125, including international members and fellows in training, women appear to be well represented across all levels of leadership within the College (Table 8).

When asked what type of additional ACC programs would interest them, women were more interested in the topics of negotiating (77% vs. 66%, $p < 0.0001$), professional development (84% vs. 65%, $p < 0.0001$), grant writing (57% vs. 43%, $p < 0.0001$), and mentoring (73% vs. 54%, $p < 0.0001$), whereas men expressed more interest in additional programs in leadership training (49% vs. 63%) and, to a lesser extent, practice management (67% vs. 70%, $p = 0.02$). Respondents were more interested in online programming compared with an ACC annual meeting program or local program (for example, 33%, 28%, and 15% for professional development, respectively).

Discussion

As the burden of cardiovascular disease continues to grow, maintaining a workforce to meet these needs is important to both providers and consumers of U.S. health care. The representation of women in subspecialty training in cardiology has increased significantly over the past 10 years from 10% in 1996 to 18% in 2004 (2,3). The number of practicing female cardiologists in the United States has similarly increased from 5% in 1996 to 8% in 2006 (ACC membership file). The current survey of career and lifestyle

Table 8. ACCF Member Participation in Leadership Activities

Member Level	2006		1996	
	Women (%) n = 2,831	Men (%) n = 32,125	Women (%) n = 964	Men (%) n = 18,764
Presidents (current and past)	2 (6)	31 (94)	1 (2)	45 (98)
Officers/Board of Trustees	4 (13)	26 (87)	2 (6)	29 (94)
Board of Governors	5 (8)	61 (92)	2 (3)	67 (97)
Standing committees	218 (17)	1,057 (83)	44 (10)	400 (90)
Standing committee chairs	12 (20)	49 (80)	5 (11)	40 (89)

Data from American College of Cardiology Foundation (ACCF) membership files. Numbers reflect the total number of members during the year of the 2006 and 1996 studies, respectively. Data presented in parentheses are number (%) of female or male members serving in each role. The same individual may serve in more than one capacity and was counted each time.

issues of male and female cardiologists documents a number of similarities as well as notable differences.

Over the past decade, there have been some areas of progress and other areas of concern in medicine in general and cardiology in particular. The current survey highlights a continued high level of personal and career satisfaction among both male and female cardiologists. Furthermore, the important influence of mentors holds true for both sexes.

A number of inequalities were still identified. Fewer women than men in cardiology are married or have children, representing a common trend across a broad spectrum of professional women (4). One possible reason for this trend is our concerning finding that the majority of women in cardiology continue to experience discrimination, largely because of gender in general, and particularly because of parenting responsibilities. In further defining the issues, we can better outline a plan and goals for reaching gender parity, embracing all members of the community, and meeting our workforce needs.

Practice Setting and Work Hours

Over the past decade, there has been a trend for more men and women to work in an academic setting and work less than full-time. Almost one half of the women respondents and one third of the men describe their practice as academic, suggesting a shift towards university or medical school practices and away from private practice. At present, 80% of women and 82% of men describe themselves as working full-time; this represents an absolute decrease of 6% for women and 13% for men compared with 1996. The number of women who are working less than full-time is unchanged, but the number of men in part-time practice appears to have doubled. An even more dramatic increase appears to be the number of men who are not practicing medicine or have “other” arrangements, increasing from 1% in 1996 to 12% currently. Men may be retiring early or working in administrative roles or may be striving for a better work-life balance. Also, more men than women are taking longer breaks in their careers. The number of men who interrupt their practice for more than a month has increased from 13% to 24%, but most of their reasons were not enumerated. At the same time, fewer women interrupted their training or

their practice for pregnancy. Whether this reflects more liberal recommendations for continuing to work during pregnancy or, as other investigators have suggested (5), a greater degree of guilt or overt or subtle pressure not to burden one’s colleagues is unknown. The trend for more men and women to choose to work less than full-time may have significant implications across the profession, including workforce supply, volunteerism, continuing medical education, and membership in professional societies, and requires further investigation and planning.

Personal and Family Issues

Traditional family roles are more common among male cardiologists; over 90% of men are married with children. Conversely, only 73% of female cardiologists are married, and a smaller fraction have children, with the discrepancies in marital status and choices in childrearing unchanged over the last decade. Choices in childcare arrangements also remain quite different between male and female cardiologists, as an increasing majority of men have their spouses providing all of the childcare. Other trends in childcare arrangements include a two-fold increase in the use of daycare and onsite childcare facilities for both sexes. The reasons fewer female cardiologists decided not to marry or to have a family were not explicitly asked in our surveys, but other studies of physicians suggest the burden of the family responsibilities disproportionately falls to the woman professional and impedes her advancement by both personal volition and external discrimination.

Other studies have sought to elaborate on the inherent conflict between demanding careers and parenting. A Yale survey of female medical school graduates from 1922 to 1999 found that those without children were more likely to be in surgical specialties and to work full-time and less likely to be in primary care. Furthermore, one third of those without children felt they had to choose between having a career and having a family, and 46% felt they could not be both good mothers and good doctors (6). The choice of marriage and parenthood has been shown to differ between men and women in other medical fields such as general surgery, otolaryngology, and cardiothoracic surgery (7,8). In these other studies of professional women, they were less likely to be married and more likely to marry later in life and

to have fewer children than they would wish. Similarly to the female cardiologists in our survey, female surgeons appear to have primary responsibility for childcare in their families. Furthermore, female surgeons also had primary responsibility for household tasks (6). Also, in a study of medical students, residents, and faculty members at a Canadian medical school, women at all levels of training were more likely to be single, childless, and to express a lack of time for family (9). The recently released National Institutes of Health study of gender disparities in retaining scientists among its own staff revealed that the heavier burden of family responsibility was one of the primary factors for women to not pursue advanced research careers. The majority of married female scientists had spouses who worked full-time compared with one half of their married male counterparts. Furthermore, of the dual-career couples, women were more likely to make career concessions than men. Spending time with family, affordable childcare, and plans to have children were ranked as more important to women, whereas salary was considered to be more important to the men (10).

One of the inherently unique impediments for working women is the burden of pregnancy and maternity leave. The Family Medical Leave Act was passed in 1993, and subsequent institutional policies have been made compliant. Between 1996 and 2006, there appears to be an increase in medical institutions with family leave policies in place; yet still, nearly one half of respondents reported that either their institution had no official policy or they were not aware of its details. Today, a minority of female cardiologists was both familiar and satisfied with their administrative family leave policy, and this has not changed substantially in the past 10 years. Restrictive and financially burdensome policies as well as colleagues' attitudes may be why the majority of female cardiologists have never taken a leave of absence for more than 1 month (65% of those in training and 56% in practice). Furthermore, more men and women are taking on other caregiver duties, predominately of a parent or an in-law. This will place further demands on work hours and family leave. More liberal and flexible leave and creative work hours in cardiology in particular and medicine in general may entice more women to enter the field, allow more women to have children and families, and allow both sexes to achieve a healthy work-life balance.

Career Satisfaction and Advancements

Overall satisfaction with cardiology as a career has remained remarkably high for both men and women. Women's career satisfaction appears to have increased from 80% in 1996 to 90% currently, now equaling the level reported by men. Overall enthusiasm for cardiology has increased dramatically in the past 10 years; the number of both men and women who would strongly encourage cardiology as a career has nearly doubled, and dramatically fewer would discourage those seeking guidance. Since the overall satisfaction level has only modestly increased in the past decade, other

factors must be influencing cardiologists' markedly stronger recommendations for prospective careers in cardiology. It may be that the future of cardiology or medicine in general has greater potential and expected growth than it did in the mid 1990s. These findings are similar to other recent surveys indicating a high level of career satisfaction among physicians (7,11-15). In most surveys, including ours, career satisfaction was not separated by marital or childrearing status. However, in a Canadian study, both men and women without children reported lower levels of satisfaction with their careers, and married female physicians reported lower job satisfaction than their married male counterparts (9).

In a question asking whether the respondent's level of advancement was higher or lower than his or her contemporaries, the gender differences may reflect less confidence or lower self esteem among female cardiologists as well as true gender differences in career trajectories. More women report that family duties slowed their career advancement. Furthermore, these differences are essentially unchanged from our survey of a decade ago. Similarly disproportionate family demands and self confidence have been shown to pull women away from the workforce in general (16) and advanced science careers in particular (10). Greater personal and family responsibilities are cited as reasons for slower advancement among women compared with men in otolaryngology and ophthalmology (17). Female cardiothoracic surgeons perceived a lower level of career advancement compared with their male counterparts and also report lower income (7). Although our survey asked about satisfaction with compensation, actual salaries were not obtained. There appears to be a significant difference between sexes in the academic setting but not in private practice, as more women than men in academics remain dissatisfied with their financial rewards; this has not changed over the past 10 years. If retaining women in faculty positions in medical schools is indeed a priority, then financial compensation packages need to be examined along with the other issues of flexibility and control as above.

Radiation Risks

Occupational exposure to radiation is of concern to both men and women. Female cardiologists made more changes in their training and careers to reduce exposure, likely because of concerns related to risks to a developing fetus. The majority of women did not perform fluoroscopic procedures while pregnant. Furthermore, one fourth of women specifically selected career tracks to reduce their radiation risk, a finding which may partially explain the under-representation of women in interventional cardiology. When compared with the previous survey, more women are now consulting hospital radiation safety policies. Although these data are consistent with an improvement in awareness of and/or development of hospital policy on occupation radiation risks and pregnancy, women still report using a wide range of

resources. Since the last survey in 1996, the ACC has published a consensus document on radiation safety in cardiology, but both men and women are either unaware of this document or chose other sources to educate themselves (18).

Discrimination

Unfortunately, nearly one half of all cardiologists have experienced discrimination during their career. Compared with 1996, women in 2006 experienced the effects of discrimination with a similarly high frequency but with less of a negative impact on professional activities, patient care, and ACC activities. Men also experienced the effects of discrimination with a similar frequency of 21% to 22%, but with far greater negative impact today, whether on professional activities, patient care, or ACC activities. Furthermore, the type of discrimination has shifted over the past 10 years. Women experienced less gender discrimination in 2006 but greater discrimination on the basis of parenting responsibilities, despite the fact that the number of women with children has not changed. In our current survey, both men and women noted racial and religious discrimination. This may be linked to the increased percentage of international medical graduates in U.S. medical residencies (42%) and cardiology fellowships (32%) (2). In a recent statewide survey of practicing physicians of various specialties, a similarly high level of discrimination was noted; 63% of respondents had experienced some type of discrimination, with 27% of men aware of a significant gender bias against women and 44% of U.S. medical graduates reporting a significant negative bias against international medical graduates (19). Similarly, more female cardiovascular surgeons reported discrimination on the basis of sex throughout all aspects of preparation for and practice of their careers and also believed that this negatively influenced their career trajectory (7). In our current study of female cardiologists, the number of women who have experienced discrimination remains inexcusably high at 69%. Future work is needed in cardiology in particular and medicine in general to create a less hostile work environment in order to encourage and support more women in the profession.

Mentoring

The majority of cardiologists surveyed have had a mentor during their subspecialty training, and most of these mentors were men. Similar to the prior survey, both men and women continue to have a very high level of confidence in their mentors; mentors exerted positive influences in most aspects of career development for both sexes. One encouraging trend is that today, more women feel that their mentors were a constructive help with planning their career. Unfortunately, the majority of mentors were not positive personal role models and actually had a negative influence on family and lifestyle issues for both sexes, but more so for women.

A number of previous studies have stressed the importance of mentors in the choice of career paths and for success within a given specialty. The recent survey of the British Cardiac Society emphasized the importance of mentoring for recruiting and retaining trainees as well as junior faculty (or consultants) (20). Also, the recent survey of National Institutes of Health scientists emphasized mentoring as being crucial to retaining talented women in research tracks (10). There has been an active effort to institutionalize and promote mentoring at many levels in a physician's training and career. For example, the ACC WIC section initiated a Web-based mentoring site for women that has been more broadly adopted by other groups within the ACC.

Conclusions

In summary, the current survey reveals some areas of progress, including an overwhelmingly high level of career satisfaction and an increased positive effect of mentors. We identified several areas that will require further attention: reducing discrimination, equality in the academic setting, reducing the barriers to childrearing, and increasing ACC leadership. For the culture of medicine to change, institutions must first acknowledge the pervasive impediments for women and improve their support for women throughout their careers such that leaders of hospitals, practices, departments, sections, and subspecialty laboratories can set an example of not tolerating any type of discrimination. With regard to childrearing, it will take changes in both the workplace and in society in general. The ACC has a fair family leave policy for its employees, but its membership is more diffuse. Finally, women must be both actively recruited and encouraged by mentors to pursue leadership roles.

Appendix

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