

# Experiences of Women in Cardiothoracic Surgery

## *A Gender Comparison*

Carolyn M. Dresler, MD; Deborah L. Padgett, PhD; Susan E. Mackinnon, MD; G. Alexander Patterson, MD

**Objective:** To assess the career and practice experiences of cardiothoracic surgeons, with references to gender similarities and differences.

**Design:** Four-step mailed 115-question survey.

**Subjects:** All identified women, and a cohort of men, certified by the American Board of Thoracic Surgery.

**Main Outcome Measures:** Academic rank, career background, salary, perceptions and experiences of harassment or discrimination, and personal life characteristics.

**Results:** No differences were found in training backgrounds. More men (64%) than women (52%) were in university practices. Comparable proportions of men and women were assistant professors (27%), but more men (27%) than women (13.6%) were full professors. Fifty-eight percent of women and 21% of men reported sala-

ries of less than \$250 000; 62% of men and 32% of women had incomes over \$350 000. Career satisfaction was comparable between genders; however, women perceived the promotion process as unfair and unrelated to academic rank. Both genders encouraged men toward a surgical career; men were less likely than women to encourage women to pursue a surgical career ( $P < .01$ ). Women, much more than men, believed that discrimination hindered their career development ( $P < .001$ ). Characteristics of personal life were also considerably different between the genders.

**Conclusion:** Although practice and training parameters for male and female cardiothoracic surgeons are comparable, work experiences, personal life, and career rewards such as salary and promotion, and perception of discrimination are different.

*Arch Surg.* 1996;131:1128-1134

NOTICE  
This Material May Be Protected  
Copyright Law (Title 17 U.S.C.)  
PROVIDED BY  
Rockford Memorial Hospital  
Health Science Library  
2400 N. Rockton Avenue  
Rockford, IL 61102

**D**ESPITE THE increasing numbers of women in medicine, relatively few choose a career in surgery or surgical subspecialties in contrast to other specialties.<sup>1,2</sup> In 1993, 2.3% of the residents in cardiothoracic training were women. In the United States, fewer than 60 women were among the 5000 physicians board certified in cardiothoracic surgery.<sup>1</sup> At any point in their specialty training or practice, men constitute more than 95% of cardiothoracic surgeons. Studies exploring how women are coping in previously male-dominated medical specialties are increasingly reported in the literature. Attention to the experiences of women in these subspecialties is important in addressing issues related to recruitment, advancement, and retention.

A recent study by Mizgala et al<sup>3</sup> surveyed female surgeons in Canada on a variety of quality-of-life issues as they pertain to their choice of specialization. The majority of respondents were in obstetrics and gynecology (41%), followed by ophthalmology (21%) and general surgery (12%). Too few women were sur-

veyed in the subspecialties of urology, otolaryngology, and cardiothoracic surgery to allow for independent analysis. They noted the trend of women away from solely obstetrics and gynecology as encouraging. Although the trend is positive, the study also identified needed changes in surgical programs that would enhance working conditions for all trainees.<sup>1</sup>

Recent attention and concern has focused on experiences of discrimination and harassment within medicine.<sup>4</sup> Studies have described the incidence and type of discrimination and harassment and suggested potential remedies.<sup>6,1</sup> Of particular concern has been the experiences of women physicians in the traditionally male-dominated specialties, most notably surgery.<sup>10</sup>

The career and practice characteristics of women in subspecialties predominantly represented by men need to be further examined as an initial effort to

*See Invited Commentary  
at end of article*

From the Division of Cardiothoracic Surgery (Drs Dresler and Patterson) and Plastic Surgery (Dr Mackinnon), Washington University, St Louis, Mo, and School of Social Welfare, University of Wisconsin, Milwaukee (Dr Padgett).

## METHODS

### STUDY POPULATION

All identifiable female thoracic surgeons practicing in the United States were surveyed. The names of women were obtained by reviewing the published 1993 directory from the American Board of Thoracic Surgery. All female or possible female names were cataloged. The names that were possible for either gender were telephoned and simply questioned regarding the gender of the specific physician. The same 1993 directory was used to identify a cohort of board-certified male thoracic surgeons. Potential respondents were selected after matching for geographic region, years of certification and training, and age. We also attempted to balance academic and nonacademic practice settings. Additionally, an older cohort of male cardiothoracic surgeons was selected to potentially allow for comparison by age. An additional group of women who were identified as trained in cardiothoracic surgery also were sent surveys and queried about their certification status.

### SURVEY INSTRUMENT

The 115-item survey was patterned after the questionnaire used to survey Canadian women surgeons.<sup>1</sup> Specific modifications were made to generate a study relevant to the subspecialty of cardiothoracic surgery and to include a male cohort. The study was designed to acquire data in the following areas: demographics, medical education and training, practice characteristics, family life, and professional attitudes and experiences. Response options were designed for ease of the

respondent, with few open-ended questions. Several questions included 5-point Likert scale responses, eg, 1 might equal "not a lot" and 5, "a great deal." Salary was assessed as a categorical variable, with surgeons checking the salary range that reflected their income.

The questionnaire was sent in July 1993. Each questionnaire was accompanied by a cover letter explaining the purpose of the study, along with an addressed, prepaid return envelope. One month later, a reminder letter was sent requesting completion and return of the survey. Two months later, another copy of the questionnaire, along with a cover letter and a return envelope, was sent to previous nonresponders. Subsequently, 1 month later, a fourth reminder was mailed to request completion and return of the survey. Responses were entered anonymously into a computerized database. The study was closed in January 1994.

### STATISTICAL ANALYSIS

Respondent data were tabulated for descriptive purposes, yielding frequencies and measures of central tendency.  $\chi^2$  Analyses were performed to assess whether frequencies to response categories with multiple-choice questions differed from those that could be anticipated in random sampling from the null hypothesis population. For variables where a mean could be calculated, analysis of variance was used to detect significant effects. Analysis of covariance assessed statistical significance after controlling for age and years of experience. For all analyses, a P value of .05 was used to indicate statistical significance; these values are reported for bivariate and multivariate analyses. Data were analyzed and descriptive statistics calculated with SAS software (version 6.07, SAS Institute, Cary, NC).

understand the career experiences and work and family issues for women in these areas. This understanding may facilitate efforts of recruitment, retention, and advancement of all surgeons. The present study describes the objective characteristics of the training and practice of cardiothoracic surgeons. In addition, the attitudes and experiences of women and men in cardiothoracic surgery are examined.

### SAMPLE

The response rate was 61% for board-certified or board-eligible women. Because the response rate for the "older" male cohort was 35% and 53% for the "younger" male cohort, the 2 groups were combined for an overall response rate of 44%. There were no statistical differences between the 2 male groups on training and demographic characteristics, so the 2 groups of men were combined. Additionally, the sample was restricted to those employed in full-time clinical surgical practice and board eligible. Therefore, the final sample consisted of 100 cardiothoracic surgeons, 41 women and 59 men.

The men had an average age of 46 years ( $\pm$ SD, 9.3). The women were significantly younger ( $P < .01$ ), with an

average age of 42 years ( $\pm$ SD, 5.3). Comparably, men had finished their general surgery training an average of 15 years prior to the study; women had been finished for 11 years. Given the age differences, further statistical analyses tested or controlled for the effects of age and years of postsurgery experience and are reported below.

### EDUCATION AND TRAINING

**Table 1** summarizes the percentages and frequencies of the sample characteristics for education and training. The  $\chi^2$  analyses yielded no significant gender differences for these characteristics. However, there is a tendency for more men to have research training than women ( $P < .10$ ).

### PRACTICE CHARACTERISTICS

Although more women (24%) than men (8%) described their practice as all cardiac, when the practice categories of all cardiac and mostly cardiac are combined, the proportions are comparable (**Table 2**). Slightly more men (64%) are practicing in university or university-affiliated settings than women (52%) and slightly more women (28%) reported being in private practice than men (15%,  $P < .1$ ). Of those in university practices, 76% of the women had a full-time university appointment in contrast to 51% of the men. This difference was not signifi-

**Table 1. Number (Percent) of Respondents by Education and Training**

Educational and Training Characteristics	Women (N=41)	Men (N=59)
First choice of medical school	30 (73)	49 (83)
Graduated in top 5% of class	11 (27)	19 (32)
First, choice of internship	27 (66)	43 (73)
5 y of general surgery training	25 (61)	38 (64)
First choice of general surgery training	30 (73)	47 (80)
First choice for cardiothoracic training	33 (80)	55 (93)
?1 y of additional clinical training	21 (51)	25 (42)
>.1 y of additional research training	7 (17)	20 (34)
2 yy of cardiothoracic surgery residency	33 (80)	46 (78)
No additional training after cardiothoracic training	29 (71)	42 (71)

\*No significant differences at  $P < .05$ .

cant. There were comparable proportions of men and women with the rank of assistant professor (27%), but 27% of the men (n= 10) and only 14% of the women (n=3) were full professors.

Two-way analysis of variance revealed no main effect for gender of faculty. There were no overall differences between men and women faculty when compared for years of experience. As would be expected, faculty at the level of associate professor and full professor have more years of experience than those at the level of assistant professor. However, women assistant professors had more years of experience (mean, 13.2 years) than male assistant professors (mean, 8.9 years).

Overall, respondents reported a wide range of numbers of publications in peer-reviewed journals. The highest proportion of men and women (mode) reported no publications (22% women, n=8; 11% men, n=6). Only 1 woman, compared with 12 men (23%), reported having more than 50 publications. There were no significant differences in numbers of publications between men and women at the associate or assistant professor rank. One woman, in contrast to 9 men (15%), reported having received a peer-reviewed research grant.

There were no significant differences for gender for time spent in professional activities. On average, respondents reported that they spent 76% of their time in patient care, 13% on teaching, 9% on research, 11% on administration, and 15% on "other."

The average number of hours worked per week also did not vary for gender, even when controlling for age or years of experience. Women reported an average workweek of 71 hours, while men reported that their workweek was 69 hours. Work hours also did not vary significantly across levels of income. There were no overall gender differences in hours spent in the operating room.

### SALARY

Overall, there were gender discrepancies concerning salary, distinctions that persisted despite age, practice characteristics, or professional rank. Among all surgeons, almost two thirds of the men and one third of the women were in the highest salary category. Salary differences also existed among younger surgeons (**Table 3**).

**Table 2. Number (Percent) of Men and Women Cardiothoracic Surgeons by Type of Practice**

Type of Practice	Women (N=41)	Men (N=59)
All cardiac	10 (24)	5 (8)
Mostly cardiac	13 (32)	29 (49)
50% Cardiac/50h thoracic	3 (7)	6 (10)
Mostly thoracic	2 (5)	4 (7)
All thoracic	7 (17)	5 (8)
Other	6 (15)	10 (17)

\*No significant difference at  $P < .05$ .

Comparing years of experience and publication rates across salary categories yielded no significant differences. In the top 3 salary categories (above \$150000), years of experience and number of publications were similar across income levels. Thus, salary levels do not appear to be reflective of seniority or publication success. This was true for both men and women. However, surgeons with higher salaries reported more hours in the operating room regardless of gender; both male and female surgeons reported spending more hours in the operating room as their salary category increased.

Even though the subgroup in private practice was small, the salary differences were distinguishing. Men reported salaries in the highest category (78%, n=7); women indicated their salaries to be \$150 000 to \$250 000 (60%, n=6). There were no significant differences between men and women in private practice in the average number of hours worked or number of hours in the operating room.

Of those who reported practicing in a university-affiliated hospital, most women (54%, n=7) reported salaries within the \$150 000 to \$250 000 range, whereas most men (53%, n= 10) reported salaries of more than \$350 000. At the assistant professor level, 70% (n=7) of the men reported salaries of more than \$250 000 compared with 33% (n=2) of the women. For associate professors, 54% of the women reported salaries of \$150 000 to \$250 000 (n=6) in contrast to 33% of the men (n=5); 54% of the men (n=8) at the associate professor level indicated salaries of \$350 000 or higher compared with 36% of the women (n=4). The numbers, however, were too small for statistical comparison.

### DISCRIMINATION AND HARASSMENT

There were several questions to assess the presence and degree of discrimination and harassment experienced. Respondents were asked for the frequency of discrimination and harassment, who did the harassing and discriminating, to what extent they were bothered by the harassment, and the type of harassment.

During their general surgery training, women reported significantly more experiences of discrimination from male or female attending staff, male or female resident colleagues, medical students, nursing staff, hospital support staff, and patients and patients' families (**Table 4**). Furthermore, there were significant disparities during cardiothoracic surgery residency training, with women experiencing discrimination from male attend-

**Table 3. Annual Income by Gender**

Income, \$	All Cardiothoracic Surgeons,* No. (%)		Cardiothoracic Surgeons Aged 46 y,t No. (%)	
	Women (N=38)	Men (N=58)	Women (N=34)	Men (N=40)
<250000	22(58)	12 (21)	22 (65)	7(18)
250000-350000	4(10)	10 (17)	4 (12)	8(10)
>350000	12(32)	36(62)	8(24)	25 (62)

\*X<sup>2</sup>=13.9, P<.001.

t<sub>x</sub><sup>2</sup>=175, P<.001.

ing staff and male resident colleagues. Even subsequent to their training, women reported significantly more discrimination from male peers. Additionally, women reported more gender bias during the selection process for general surgery training (P<.001) and for cardiothoracic surgery residency training (P<.001).

In response to whether they believed discrimination hindered their career development and advancement, women were significantly more likely than men to report that prejudice had negatively affected their careers (P<.001). Almost all of the men who responded indicated that they never believed that sex discrimination hindered their career development (98%; n=50), whereas 41% of the women (n=21) reported that they frequently or somewhat frequently believed gender bias was a career hindrance.

Reports of harassment from male attending staff and male resident colleagues were significantly higher for women than men during general surgery training and cardiothoracic residency training. More than half (55%, n=23) of the women reported frequent or somewhat frequent harassment from male attending staff during general surgery training and 42% (n= 17) during cardiothoracic residency training.

The persons responsible for these incidents were primarily male attending staff and residents. The types of harassment women experienced are summarized in **Table 5**. Verbal innuendos were the most commonly reported forms of harassment.

More than half of the male (53%, n=27) and female (52%, n=21) respondents were aware of a policy at their employing institution for grievances about sexual discrimination. However, women were significantly less satisfied with the policy than were men (F=7.55, P<.01). Comparably, more than half of the men (55%, n=29) and women (58%, n=22) reported that they knew of a policy about grievances regarding sexual harassment. Significantly fewer women than men were satisfied with this policy (P<.001).

### CAREER SATISFACTION

There were no gender differences in the degree to which surgeons were happy with their surgical career. Both men and women reported being moderately happy with their career: based on a scale of 1 to 5, with 1 indicating "extremely happy," the average response was 2.5. The degree of career satisfaction did not vary across salary categories.

However, there were significant differences with the

**Table 4. Average Responses of Men and Women on Experiences of Discrimination**

When and by Whom	Mean Score (N)	
	Women	Men
General surgery		
Male attending staff	3.2 (41)	1.1 (52)
Female attending staff	1.9 (26)	1.1 (49)
Male resident colleague	3.1 (40)	1.0 (51)
Female resident colleague	2.3 (33)	1.1 (51)
Medical student	2.1 (39)	1.1 (51)
Nursing staff	2.9 (40)	1.1 (51)
Hospital support staff	2.4 (37)	1.1 (51)
Patients or patients' families	2.5 (40)	1.1 (51)
Cardiothoracic residency		
Male attending staff	3.3 (41)	1.6 (50)
Female attending staff	2.0 (15)	1.6 (50)
Male resident colleague	2.7 (10)	1.6 (50)
Female resident colleagues	1.7 (23)	1.7 (50)
Medical students	1.6 (38)	1.6 (50)
Nursing staff	2.1 (41)	1.6 (50)
Hospital support staff	2.0 (41)	1.6 (50)
Patients or patients' families	2.1 (11)	1.7 (50)
Since training		
Male peer	3.3 (41)	1.4 (48)
Female peers	1.6 (36)	1.5 (48)
Nursing staff	1.9 (41)	1.5 (48)
Hospital support staff	1.6 (41)	1.5 (48)
Patients or patients' families	1.8 (41)	1.5 (48)

\*Responses were scored on a scale of 1, never; 3, sometimes; and 5, frequently.

tP<.01.

sense of fairness about promotion within a university setting. Compared with men, women were more likely to indicate that promotion had been less fair. On a 5-point Likert scale (1= extremely fair), the average response for women was 2.8 (n=22) and 2.0 for men (n=38). Regardless of faculty rank, women were more likely than men to report an impression of unfair promotion practices.

### ROLE MODELS AND ENCOURAGING SURGICAL CAREERS

Women were slightly more likely than men to agree to the statement, "Women doctors need role models of successful women doctors" (P<.10). However, age appears to be a factor. Men who were 45 years and younger were less likely (mean response=2.32) than women of the same age (mean response= 1.76) to indicate that women needed female role models. Both men and women reported that they did not have many opportunities to discuss ways to balance career and personal life, although 72% of the women (n=29) and 56% of the men (n=31) believed that they would have appreciated such opportunities.

Encouraging female medical students to pursue a career in surgery was an area in which a significant difference was apparent between male and female respondents. Both men and women were equally likely to encourage male medical students toward surgery. However, men were less likely (P<.01) to encourage female students toward surgery (mean response=3.1, n=54) than were women (mean response=2.3, n=41), with almost half of the male respon-

**Table 5. Types of Harassment Experienced by Women Cardiothoracic Surgeons (N=41)**

When and by Whom	Type of Harassment, No. (%)		
	Verbal Innuendo	Verbal Proposition	Physical Advances
During general surgery training			
By male attending staff	19 (46)	5 (12)	5 (12)
By resident colleagues	19 (46)	6 (15)	3 (7)
During Cardiothoracic residency training			
By male attending staff	18 (44)	2 (5)	4 (10)
By resident colleagues	14 (34)	2 (5)	1 (2)
Since training			
By peers	14 (34)	2 (5)	2 (5)

dents (45%, n=24) indicating they would never or almost never encourage women toward surgical careers. Gender differences persisted after controlling for age (P<.01).

### MARRIAGE AND FAMILY

More men than women were married, married at a younger age, had younger spouses, and were more likely to have children. Only half of the women (51%, n=21) were married compared with a majority of the men (92%, n=54). Men were significantly younger when first married (26.1 years) than were women (28.7 years) (P<.05). Additionally, the men had younger spouses (39.7 years) than did the women (45.4 years) (P<.05). Twelve women and 54 men had children.

The most frequently cited occupation of the spouses of male cardiothoracic surgeons was homemaker (40%), followed by "other" (21%), medical (19%), and professional (19%). For women cardiothoracic surgeons, their spouses were more likely to be surgeons (30%) or professionals (26%) or in other medical careers (17%), with 13% of women identifying their husbands as homemakers.

The majority of men (76%) reported that their spouse primarily had responsibility for household tasks and 38% of the women reported that they were primarily responsible. Forty percent of the women indicated that they had a paid housekeeper, although that percentage increased to 75% among the women with children. Comparably, women reported spending more hours per week on household tasks (10.9 hours) than did men (6.9 hours) (P<.05). Despite the disparity in responsibility and hours, there was no difference between men and women in their level of satisfaction with how they managed their time between work and family responsibilities.

Both men and women perceived comparable levels of support during their training from attending staff, friends and colleagues, spouse or partner, parents, siblings, and children, and identified a spouse or partner and parents as providing the highest degree of emotional support and encouragement.

### CHILDREN

Women seemed to have had their children later in their medical career than men. Almost two thirds of the women

(62%) reported having their first child during their clinical practice; the men most frequently had their first child during their internship (47%). The majority of women (92%) and men (77%) indicated that they would not change the timing of their children, although 19% of the men reported that they would have had their children later.

Men most frequently identified their spouse as having primary responsibility for child care during working hours and women identified various other arrangements, primarily a paid employee in their home. Evening and weekend responsibilities for children were described as primarily women's, either female cardiothoracic surgeons or the wives of the male cardiothoracic surgeons. Both men and women reported being comparably satisfied with their child care arrangements. However, men were somewhat more likely than women to report feeling inadequately involved in child care (men, 35%; women, 17%; P<.10).

There was no statistical difference between men and women when asked if having children markedly slowed or enhanced their careers; most men and women had a neutral response. Although the number of women with children overall was small, there was a wider variation among women than men regarding the extent to which children affect their careers. However, married women were more likely than married men to indicate that family and personal responsibilities compromised their career (P<.01).

### SATISFACTION

There were more similarities than differences between male and female cardiothoracic surgeons for questions about satisfaction with various aspects of their life. Men and women, on average, reported comparable levels of satisfaction about their financial situation, community, hobbies, health and physical condition, and friendships. Women, however, were more likely than men to report that they had inadequate time for friendships (P<.05) and hobbies (P<.05). Men and women reported similar levels of happiness in describing themselves and their marriages.

There were a few interesting differences between married and nonmarried women surgeons. Nonmarried women were less likely than married women to describe themselves as happy (P<.05) and were marginally less happy with their decision about a surgical career (P< 1). Additionally, nonmarried women were less likely than married women to encourage men (P<.01) or women (P<.01) to become surgeons. However, there were no differences in general satisfaction with work. Nonmarried women reported slightly higher work hours per week (75.0 hours) than married women (67.0 hours) but hours in the operating room were comparable.

In 1993 to 1994, 42% of all accepted medical school applicants were women.<sup>9</sup> In 1991 only 4.6% of all women residents were in surgery. Seven, or 0.2%, of all women residents were in cardiothoracic training. This was 2.3% of all residents in cardiothoracic training.<sup>1</sup> According to the Association of American Medical Colleges Graduat-

ing Student Survey Report for 1990, fewer than 1% of students were planning a career in cardiothoracic surgery, and 92% of this group were men.<sup>10</sup> As of 1993, fewer than 60 women were among more than 5000 physicians board certified in cardiothoracic surgery.

Among medical doctors, cardiothoracic surgeons are frequently described as being the archetypical surgeon-aggressive, dominating, authoritarian, action-oriented, materialistic, and extroverted." It is expected and taught through emulation that these are desirable characteristics, and, certainly, some of them are useful in a successful cardiothoracic career. But are these desirable or attractive attributes to women interested in pursuing this specialty? Why are not more women entering and completing training in cardiothoracic surgery? How can more women be encouraged and supported in pursuing certification in this current predominantly male specialty.

### TRAINING AND PRACTICE

The education and training experiences of female and male surgeons are comparable. Similar proportions of men and women received their first choices for internship and general surgery training; a slightly higher percentage of men received their first choice for their cardiothoracic training. Following general surgery, the trend was for men to pursue additional training in research and women in clinical rotations. Both reported similar lengths of cardiothoracic residencies, with comparable numbers of men and women choosing full-time practice.

The descriptions of the type of environment and location imply that women tend to practice more in private offices, with men choosing university settings. Perhaps there are characteristics of private practice vs the university setting that may be more appealing to women, or, conversely, aspects of the academic environment that are not supportive. One finding is the tendency of male trainees to pursue research training, which may then direct them into university positions, which tend to reward research activity. It is not known if the women surveyed were encouraged or discouraged into research experiences, thus perhaps affecting their viability in a university position. However, previous work has shown that women with similar academic productivity as their male colleagues receive fewer promotions or monetary compensation.<sup>12</sup> Alternatively, there may be specific features of private practice, such as hour flexibility, that are more attractive to female thoracic surgeons.

Of those surgeons in university settings, more men than women have achieved the rank of full professor. While this might represent inequitable promotions, it may also reflect that few women have been in tenure-track positions long enough to be promoted—a "cohort" effect. However, women in assistant ranks had more years of experience on average than did their male counterparts. We cannot determine from our data whether men are promoted more quickly than women since our measure reflects years of practice and not specifically years in university practice. However, the inequitable promotion of women in academic medicine despite equal backgrounds and productivity has repeatedly been demonstrated.<sup>12,17</sup> Time will reveal whether women advance to

professor in comparable proportions to men in university ranks in cardiothoracic surgery.

In general, there are more similarities than differences in the training and practice experiences of male and female cardiothoracic surgeons. Given the time demands for training and residency, both appear to be making comparable commitments to this subspecialty. Yet rewards, as measured by remuneration and academic rank, are not similar for women and men cardiothoracic surgeons.

### OBJECTIVE AND SUBJECTIVE BENEFITS

The salary differences are striking. Almost half of the women reported a salary markedly less than that reported by the men. This discrepancy remained across practice settings, despite similarities for work hours, age, and years out of training. Hours in the operating room, however, did appear significant in ways that may be meaningful. For men and women, surgeons with higher salaries had more time in the operating room. Given that salaries were measured in categories and that the sample was relatively small, it was not possible to control for operating room hours in comparing salaries.

It is generally perceived that physicians in private rather than academic practices, and cardiac rather than general thoracic practices, generate larger salaries. Although private practice and cardiac surgery may be more lucrative, it is again clear that the degree of financial success interacts with gender.

For surgeons affiliated with universities, salary discrepancies were apparent within comparable ranks. When women are compared with men, at either the rank of assistant or associate professor, their salaries are less. These differences cannot be explained by working or publishing less, as clinical hours and publication rates within assistant and associate ranks were similar. The impressive statistical difference within the ranks of assistant professor and associate professor and the salaries would appear to be most parsimoniously attributable to gender.

Salary is not the only, or, perhaps, even the most important dissimilarity between the genders in academic cardiothoracic surgery. Critical for happiness or feeling of satisfaction in any profession is the acceptance, encouragement, and promotion of the individual within the specialty. Overall, men and women reported being "satisfied" with their careers as surgeons. However, less global statements yielded some troubling differences. The women in academic cardiothoracic surgery described an impression of unfairness in their promotion process, significantly more so than their male colleagues. This is in spite of being equally successful in medical school and in competition for residency positions (for general surgery and cardiothoracic surgery). The Association of Women Surgeons survey also addressed the issue of tenure and fairness in promotion policies at universities. Seventy-five percent of women believed that the university policies relating to tenure were not fair to female physicians." This sentiment was expressed in our study.

Although neither the men nor the women in our survey reported having had frequent contact with people with

whom they could discuss family and career concerns, cardiothoracic surgeons generally thought that role models were important for women physicians. Surprisingly, it was the younger cohort of men who were not as supportive of the need for female role models for women. Much has been written about the usefulness of the role model or mentor in the recruitment or sustenance of the resident or early graduate. A previous survey of the Association of Women Surgeons in 1991 demonstrated that 94% of women surgeons believed that female medical students needed successful female surgeons as role models.<sup>1</sup> As most cardiothoracic surgeons decide on their career path while in medical school or early residency,<sup>2</sup> women medical students need to be able to know and work with successful women cardiothoracic surgeons, both clinically and in the laboratory. At the present time, with women representing only 1% of the board-certified cardiothoracic surgeons, the numbers are insufficient to be a presence for women medical students.

Women cardiothoracic surgeons reported experiences of harassment and discrimination, situations they believed negatively affected their career. While there were reported incidents of discrimination and harassment at all points in their career and training, the problem appears to be most extensive during general surgery training from senior professionals, peers, and patients. If this is the background of women during surgery training, these perceptions may serve to discourage women from continuing to pursue a surgical career.<sup>2,3</sup> Prevention needs to be a critical response to the problems of harassment and discrimination, especially in the training environment.<sup>4</sup>

Additionally, although our respondents reported that policies existed in their employing institutions concerning harassment and discrimination, the women were generally neutral about the effectiveness of these policies. The presence of adequate policies would indicate a willingness to provide a nonhostile work environment, a commitment to not tolerate inappropriate and damaging behaviors.

The finding that male surgeons were not encouraging of women toward careers in surgery is troubling. Our survey did not address the issue of why male surgeons are reluctant to include women in their specialty but it does raise questions about the extent of support and encouragement by male surgeons toward their female colleagues. It would be worth exploring what were the concerns of male cardiothoracic surgeons regarding women in the profession. Differences in salary and attitudinal factors forecast work conditions that women may not find rewarding. Further, recruiting more women into this subspecialty may not represent a concern for the male majority of the profession.

Among cardiothoracic surgeons, a woman's family life is considerably different than a man's. Women are less likely to be [married to](#) marry later in life, and to have fewer children than they would wish. In addition, women surgeons appear to have primary responsibility for child care and household tasks. Comparable work hours, with career and family satisfaction, suggest a high professional commitment and success at managing both a career and family. While the overall proportion of women in cardiothoracic surgery is small, the number of women

with families is even smaller. The availability of female role models for balancing work and family demands in cardiothoracic surgery is thus extremely limited. Future research may wish to explore whether lifestyle factors are influential in selecting or rejecting cardiothoracic surgery by women medical students.

---

#### CONCLUSION

At present, 30% to 50% of medical school graduates are women. These women are now beginning to enter residency and attending positions in record numbers, especially in specialties that already support a significant membership of women, such as pediatrics, obstetrics and gynecology, and internal medicine. Surgery and surgical subspecialties such as cardiothoracic surgery remain overwhelmingly dominated by men. Even though practice and training for men and women cardiothoracic surgeons are comparable, our results found that family life, salary, experiences of discrimination, harassment, and promotion were different. A recent article on the "paradox of critical mass for women in science" concludes that increased numbers are not enough. Rather, the environmental context needs also to be considered with institutional policies and programs on child care, parental leave, recruitment, retention, and promotion. Conditions and structures that equitably reward people for commitments and job demands regardless of gender, along with training and practice environments that are supportive rather than discriminatory, can only benefit both sexes.

*Corresponding author:* Carolyn M. Dresler, MD, Department of Surgery, Fox Chase Cancer Center, 7701 Burholme Ave, Philadelphia, PA 19111.

#### REFERENCES

1. Peebles RJ. Female surgeons in the US: an 18-year review. *Am Coll Surg Bull.* 1989;74:18-23.
2. Lillemoe KD, Ahrendt GM, Yea CJ, Herlong HF, Cameron JL. Surgery: still an old boys' club? *Surgery.* 1994;116:255-261.
3. *The Official American Board of Medical Specialties Directory of Board Certified Thoracic Surgeons.* 6th ed. New Providence, NJ: Reed Publishing Co; 1992.
4. Mizgala CL, Mackinnon SE, Walters BC, Ferris LE, McNeill JY, Knighton T. Women surgeons: results of the Canadian Population Study. *Ann Surg.* 1993;218:37-46.
5. Mackinnon SE, Mizgala CL, McNeill JY, Walters BC, Ferris LE. Women surgeons: career and lifestyle comparisons among surgical subspecialties. *Plast Reconstr Surg.* 1995;95:321-329.
6. Komaromy M, Bindman AB, Haber RJ, Sande MA. Sexual harassment in medical training. *N Engl J Med.* 1993;328:322-326.
7. Lenhart SA, Klein F, Falcao P, Phelan E, Smith K. Gender bias against and sexual harassment of AMWA members in Massachusetts. *JAMWA.* 1991;46:121-125.
8. Frankel SS. Sexual harassment in medical training. *N Engl J Med.* 1993;329:662.
9. Bickel J, Galbraith A, Quinnie R. Women in US academic medicine statistics 1994. *Assoc Am Med Coll.* July 1994.
10. Wilcox BR, Stritter FT, Anderson RP, et al. Profile of the contemporary thoracic surgery resident. *Ann Thorac Surg.* 1993;55:1303-1310.
11. Zerega WD, Deighton B. *Selecting the Right Residency for You: A Decision-Making Guide.* 2nd ed. Grosse Point, Mich: Success Management International; 1991.
12. Carr PL, Friedman RH, Moskorntz MA, Kazis LE. Comparing the status of women and men in academic medicine. *Ann Intern Med.* 1993;119:908-913.
13. Tesch BJ, Wood HM, Hehvirg AL, Nattinger AB. Promotion of women physicians in academic medicine. glass ceiling or sticky floor? *JAMA.* 1995;273:1022-1025.
14. Etzkowitz H, Kemelgor C, Neuschatz M, Uzzi B, Alanzo J. The paradox of critical mass for women in science. *Science.* October 7, 1994;266:51-54.

This study demonstrates that the small number of women who complete training and certification as cardiothoracic surgeons do the same kind of work, work the same number of hours, and report a similar degree of job satisfaction as male cardiothoracic surgeons despite receiving lower salaries and more sluggish promotions and perceiving more discrimination and harassment during training.

Before accepting too quickly the differences found by the authors, it is important to point out some weaknesses in the study methods. The female and male cardiothoracic surgeons were selected differently and had a different rate of response to the survey; the inclusion of an unspecified number of older male surgeons and women trained but not certified in cardiothoracic surgery further clouds the validity of their results.

Nevertheless, their findings reveal significant differences in a few areas that should provoke the concern of those in leadership positions and the need for change. Surgical chairmen and division chiefs should be committed to providing equal and high-quality opportunities and experiences for all individuals for whose careers they are responsible.

The most glaring difference in this study is the gender gap in salary, even when age, academic rank, years of experience, and hours worked are considered. This disparity existed in private practice as well as academia, with men consistently reporting higher salaries at each academic level. Another discrepancy that suggests discriminatory practice by department leadership is the slower pace of women assistant professors to achieve academic promotion, despite no difference in their number of publications or other job characteristics, such as hours worked.

Other important contrasts in the experiences and attitudes of men and women in cardiothoracic surgery include a greater reporting of harassment by women and a decreased tendency of men to recommend a surgical career for women.

Career advancement depends on several factors, including not only the drive and initiative of the individual but also a mentor who encourages and supports his or her charges. Since men continue to occupy the positions of leadership in cardiothoracic surgery and therefore hold the key to the appropriate progression of qualified women in their departments, fairness and equality in the workplace demand that they examine their own departments and resolve to eradicate any existing inequities.

Karen Deveney, MD  
Oregon Health Sciences University  
Portland

IN OTHER ARTICLES

ARCHIVES OF PATHOLOGY & LABORATORY MEDICINE

Mucosal Lymphangiectasia in Gastric Adenocarcinoma

Kong-ling Mak, MRCPATH; Pak-kwan Hui, MD; Wing-yc Chan, MB, BCh; Kai-man Leung, MBBS

**Objective.**-To describe the occurrence and significance of mucosal lymphangiectasia in gastric adenocarcinoma.

**Design.**-One hundred consecutive gastrectomies for adenocarcinoma were reviewed, using 25 consecutive gastroscopically biopsied gastrectomy specimens with peptic ulcers as negative controls.

**Setting.**- The specimens were collected over a period of 25 months in two general hospitals and processed according to a standard protocol.

**Patients.**-Chinese living in Hong Kong.

**Results.**-Twenty cases of adenocarcinoma were found to show mucosal lymphangiectasia, which was arbitrarily defined as the presence of ectatic lymphatic channels in the lamina propria having maximum dimensions greater than that of a foveolar gland. The ectatic lymphatics were lined by simple endothelium, devoid of fibromuscular wall, and they either were optically empty or contained scant mononuclear leukocytes. None of the patients had preoperative evidence of malabsorption syndrome or protein-losing enteropathy. Lymphangiectasia was most readily seen in the superficial lamina propria near the main tumor. In 10 cases (30.4%), lymphangiectasia extended to the nonneoplastic part of the gastric mucosa, at a distance of at least 2 cm away from the main tumor. Tumor emboli were seen in the ectatic lymphatics in 11 cases (55%). In two cases (10.4%), the distal line of resection was involved by intramucosal lymphatic spread. The tumor permeating the lymphatics did not evoke any inflammatory or desmoplastic reaction in the perilymphatic lamina propria, similar to the phenomenon of so-called lymphangitis carcinomatosa. In eight cases (40%), there were foci beyond the main tumor where mucosal lymphangiectasia was present, but without tumor in its immediate vicinity. All (100%) of the 20 stomachs with mucosal lymphangiectasia had metastases in regional lymph nodes, whereas only 59 of the 80 cases (73.75%) without lymphangiectasia were node-positive (P < .025). All node-negative cases did not show lymphangiectasia. Twenty-five consecutive gastrectomies for peptic ulcer disease that had undergone preoperative mucosal biopsies showed no lymphangiectasia, suggesting that mucosal biopsy was not the cause of mucosal lymphangiectasia.

**Conclusions.**-(1) Gastric mucosal lymphangiectasia is associated with carcinoma but not peptic ulcer. (2) Mucosal lymphangiectasia in gastric carcinoma signifies lymph node metastases, and (3) Gastric carcinoma can spread along the mucosa via intramucosal lymphatics. (Arch Pathol Lab Med. 1993;120:7t8-80)

Reprints requests to Department of Pathology, King's College Hospital, 52 Wythe Street, London WC1R 4JH, UK. (Dr Hui).