

EDITORIAL COMMENT

Women in Cardiology

Very Few, Different Work, Different Pay*

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Fifty years ago, there were very few women in medicine, but by 2014, almost one-half of first-year medical students were women (1). Female physicians are much more likely to select certain fields for clinical training; women currently comprise 83% of residents in obstetrics and gynecology, 73% of residents in pediatrics, and 64% of residents in dermatology (2). In contrast, very few women are pursuing neurological (16%), orthopedic (14%), or thoracic (19%) surgery. Relatively few women choose to train in cardiology: only 22% of current cardiology fellows are women, only 9% of interventional cardiology trainees are women, and female cardiologists perform only 3% of percutaneous coronary interventions in the United States (3).

What explains these striking differences in choices of medical specialties by women and men? Some specialties may simply be more appealing to women, perhaps explaining the preponderance of women in obstetrics and in pediatrics. All medical students, male and female, have shown expanded interest recently in specialties that allow them more control over their work hours, and have better pay (e.g., dermatology, radiology), rather than specialties with long and unpredictable hours (4). Concerns over work-life balance may be particularly strong for women entering medicine, who may want to start a family at the same time they are finally done with training and are starting their professional careers. To

the extent that different career choices reflect their preferences, there may be little reason for concern that there are few women in some specialties and mostly women in others. However, if some specialties are perceived as being male bastions, with a “macho” culture unfriendly to women, it would be a reason for concern. Obstetrics and orthopedic surgery are both stressful, and both have long and unpredictable hours, yet most obstetricians are women, and most orthopedic surgeons are men.

There are very large differences in physician compensation according to medical specialty and the type of work each physician performs. Economic theory suggests that supply and demand and competition for different physicians ought to determine their pay. Reimbursement for physician services is far from a free market, however, and our fee-for-service system, with its administratively determined fee schedules, rewards certain activities more than others; doing procedures counts for more than cognitive work, and quantifiable work activities are favored over other important factors such as bringing in new patients, satisfaction with care, or clinical outcomes. Comparisons of physician pay are challenging because the payment system rewards some activities more than others, and differences in clinical specialties and work activities will clearly lead to differences in pay.

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In this issue of the *Journal*, Jaggi et al. (5) provide a snapshot of the work activities and pay of male and female cardiologists in private practice. Data from 161 private practice groups were collected by MedAxiom, a practice management firm. The authors had access to detailed data about what individual cardiologists in these practices did and what they were paid, and they were able to compare data from female and male cardiologists. They report that only 9% of the 2,450 cardiologists in the sample were female and that the

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female cardiologists were much younger than the male cardiologists. There were striking differences between the male and female cardiologists in the type and amount of work they performed: women were more likely to be general cardiologists (53% vs. 28%), work part-time (20% vs. 10%), and take no call (17% vs. 7%). Female cardiologists also billed for 22% fewer work relative value units (7,404 vs. 9,497) and had 22% lower mean salaries (\$400,162 vs. \$510,996) than male cardiologists.

Female cardiologists were clearly paid significantly less than male cardiologists in these practices, but they also had significantly different work activities and revenue generation (5). Were female cardiologists in these practices receiving equal pay for equal work? The authors applied statistical models to adjust for the observed differences in the work activities of the male and female cardiologists. The raw 22% difference in mean pay (\$110,834) was reduced to a 12% difference by adjustment for work relative value units alone, and it was reduced to a 7% difference after further adjustment for other recorded variations in work activities and practice characteristics. A regression model using all available data suggests a female cardiologist with the same measured characteristics as a male cardiologist was paid \$37,717 less than predicted by the model. The fully adjusted analysis only explained about one-half of the variance in salaries, however, suggesting that other factors may contribute to the difference in pay between sexes.

Statistical models are often used to compare outcomes of different groups of patients, and there is always concern when the groups vary greatly in their clinical characteristics. Regression models can adjust for differences in measured variables, but they cannot adjust for factors that were not recorded but are important. The study of Jagsi et al. (5) had a great deal of data to analyze, but it did not include data on a few important variables, such as the number of percutaneous coronary interventions each physician performed, the number of years each physician had worked in the practice, whether the physician was a full partner, or number of referrals each physician generated; each of these factors could affect pay levels. The extent to which women may have had career interruptions due to pregnancy and child-rearing responsibilities, or were younger and not in senior administrative positions, might also have

affected their pay level (6). Furthermore, the study included just 229 women and 161 practices, and it is likely that some practices had no female cardiologists at all; any differences in pay levels between the practices with and without female cardiologists could have affected the projected pay differences between male and female cardiologists. The major point is that whenever statistical adjustment substantially attenuates the effect of a predictor on the outcome (in this case, the effect on pay of being female narrowed from 22% to 7% with adjustment), the final result may be due to residual confounding. For clinical questions, one can resolve lingering doubts about effects found in observational data by randomizing patients, but in this case, randomization is obviously impossible. Additional studies with more representative samples, as well as better statistical adjustment techniques (e.g., hierarchical modeling or propensity score matching), are needed to determine whether female cardiologists receive equal pay for equal work.

Most of the difference in pay between male and female cardiologists in the study (5) was explained by differences in their work activities. Although it is uncertain how much of the residual pay difference is due to being a female cardiologist and how much is due to differences in unmeasured factors that affect pay levels, the most striking observations of the study were how few of the cardiologists were women and how different their work was. The proportion of women who enter cardiology continues to be much lower than the proportion of women in medical schools; why are only 20% of new cardiology trainees women? Within cardiology, it is clear that women follow different career paths than men and are particularly less likely to pursue careers in interventional cardiology and electrophysiology. The reasons for these very different career choices ought to be explored further, and we need to understand whether female physicians are repelled from cardiology or simply attracted to other fields. Perhaps more attention to work-life balance in cardiology would make it more attractive to women, and better for us all.

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