Surgeon Awareness of the Relative Costs of Common Surgical Instruments

The operating room is a cost-sensitive environment, and disposable surgical instruments account for a large proportion of its costs. Because surgeons often have a choice of instruments to use, they play a critical role in managing supply costs. Previous research on surgeon cost knowledge has shown that surgeons are unskilled at estimating the price of surgical supplies. However, it is unclear whether surgeons can correctly differentiate the more expensive item of 2 surgical instruments, a task that more accurately reflects real-world decisions. Furthermore, cost report cards (CRCs) have been proposed as a passive mechanism for educating surgeons about surgical supplies to reduce spending. However, the association between CRCs and cost knowledge is unknown.

Methods | To assess surgeon cost knowledge and the association of CRCs with cost knowledge, we conducted a web-based survey of 100 attending general surgeons and subspecialists (eg, colorectal, surgical oncologist) at 3 academic health systems in Southern California. This study was reviewed and approved by each hospital’s institution review board. Written informed consent was obtained from all study participants.

The survey was created iteratively after 6 cognitive interviews. It provided pictures and descriptions of 10 instrument comparisons and asked the surgeon to identify the more expensive item of the 2 instruments presented. Because the assessment focused on surgeon cost knowledge, the items were not intended to be exchangeable but generally had a similar function (eg, 5 mm vs 10 mm Endoclip) and/or indication (eg, Endoclose vs Carter-Thomason). Instrument comparisons were tailored to each site on the basis of institution-specific item inventory.

Costs were obtained at each site and, although prices for the same item varied by institution, the cost associations (ie, which was more expensive) were consistent across sites. The primary outcome was the percentage of correct comparisons. Multivariable models were fit to assess the differences in cost knowledge between the institution with CRCs and the other 2 sites, controlling for years since training, self-reported exposure and familiarity with supply costs, and perceived importance of cost vs effectiveness when choosing surgical instruments.

Results | The response rate was 83% (n = 83). The mean (SD) correct score was 66% (12.49%; range, 40%-100%), which was better than chance (66% vs 50%; P < .001). However, substantial knowledge deficits were observed for some of the instrument comparisons (Figure). Cronbach coefficient α for the 10-item knowledge summated scale was only .11. Surgeons from the institution with CRCs reported more exposure to supply costs (odds ratio, 3.94; 95% CI, 1.49-10.41; P = .006) but not increased familiarity, nor did they perform better on the cost assessment. None of the remaining covariates were associated with cost knowledge.

Discussion | Surgeons were able to correctly differentiate the more expensive of 2 surgical instruments better than chance but had a wide variation in knowledge for some comparisons, seemingly irrespective of the cost difference between instruments in each comparison. Feedback in the form of CRCs may increase self-reported exposure but does not necessarily improve familiarity with prices or cost knowledge. Previous studies have suggested passive CRCs may decrease supply costs, but their results were modest and may be subject to publication bias. In this study, the institution with CRCs provided reports to surgeons without active engagement, mandates, or incentives. More active approaches or approaches that do not rely on surgeons retaining and applying cost knowledge, such as preference card standardization, may be more effective.

Limitations of this study include the poor internal consistency and reliability of the knowledge scale and the lack of generalizability, with respect to both the sample and the relevance of comparisons to other sites. To our knowledge, no previous study of surgeon cost knowledge has performed psychometric evaluation, and the poor internal consistency we encountered may explain previous null findings. The reason for the high variability in surgeon performance is difficult to explain. This question may be best answered with use of a qualitative approach and warrants future study.

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Trends in the Inclusion of Black and Female Surgeons in Invited Visiting Professorships

Visiting professorships (VPs) honor academic surgeons and are important for career advancement. Women are increasingly entering surgical professions yet are underrepresented in leadership, a trend that appears to be changing.1,2 We sought to understand trends in the inclusion of female and black surgeons in surgery over the past decade.

Methods | Information on VPs from the 25 top National Institutes of Health–ranked academic surgical programs was solicited, and 19 programs were able to provide schedules of invited lecturers, dates, and lecture titles from January 2007 through December 2017. This study was considered exempt from approval by the Stanford University institutional review board, and no informed consent was required.

A VP was defined as a distinguished talk, often with a specific name. The sex and race (if black) of the surgeon granted the VP, the lecture topic, and the sex of the VP chairperson were recorded. Race was classified by the investigators based on familiarity and confirmed with publicly available images of the speakers. Categorization of lecture topics based on title was performed by 5 blinded assessors (M.M.T., E.L.R., C.J.A., C.K., M.T.H.). Statistical t tests and Fisher tests were performed in Excel 2016 (Microsoft) and R version 3.5.0 (R Foundation for Statistical Computing) software. We considered 2-sided P values less than .05 significant.

Results | The number of VPs documented per year increased from 48 in 2007 to 144 in 2017. There were 1322 lectures and 747 unique speakers. A total of 645 men gave 1111 of the 1322 lectures (84.0%), and 118 women gave 211 of the 1322 lectures (16.0%). The percentage of VPs granted to women increased from 6.3% (n = 3 of 48) in 2007 to 20.8% (n = 30 of 144) in 2017 (P < .001; Figure). There were 25 black lecturers who gave 61 of 1322 lectures (4.6%), with no significant change over time. Across 19 institutions, the total proportion of female lecturers ranged from 5 of 70 (7.1%) to 26 of 87 (29.9%) and the proportion of black lecturers from 8 of 65 (12.3%) to 1 of 5 (20.0%).

Women gave a mean (SD) of 1.99 (1.71) lectures, while men gave a mean (SD) of 1.80 (1.42) lectures (P = .28). Of 20 black speakers, 9 speakers gave multiple lectures, and the mean (SD) number of lectures was 2.85 (2.94; P = .13) compared with all non-black lecturers.

The number of VPs granted to women was significantly associated with a female surgical chairperson (odds ratio, 1.48 [95% CI, 1.06-2.05]; P = .005). The percentage of female chairpersons increased from 7.1% (1 of 14) in 2007 to 26.3% (5 of 19) in 2017 (P < .001; Figure).

Of 864 lectures with titles, 588 (68.1%) were categorized with consensus between the researchers. Clinical practice was the most abundant category (296 lectures [34.3%]), followed by education/training (86 lectures [10.0%]) and research (72 lectures [8.3%]) (Table). Women spoke more often on diversity (men, 1 of 724 lectures [0.1%]; women, 3 of 140 lectures [2.1%]; P = .01) and safety/quality (men, 22 of 724 lectures [3.0%]; women, 10 of 140 lectures [7.1%]; P = .03) and less often on topics categorized as clinical (men, 259 of 724 lectures [35.8%]; women, 37 of 140 lectures [26.4%]; P = .04).

Discussion | Over the past 2 decades, surgeon demographics include an increasing number of women. We demonstrate that over the past decade, women surgeons are increasingly honored with invited VPs. A similar trend has not been observed in VPs for black surgeons. The presence of female chairpersons was associated with increased percentage of VPs granted to women, suggesting that increased representation of women in the highest leadership ranks will increase opportunities for women in surgery. However, there were not enough data to sug-