

The Financial Relationship Between the Medical Industry and Residency Leadership in OB/GYN and Urology

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ABSTRACT

Background Industry payments to physicians exceed millions of dollars. Payments can influence physicians' practices and potentially impact trainees.

Objective To examine the magnitude of industry payments to obstetrics and gynecology (OB/GYN) and urology residency directors and department chairs in the United States.

Methods For this retrospective cross-sectional study, program directors and department chairs of OB/GYN and urology residency programs were identified in December 2021. Nonresearch payments between August 1, 2013, and December 31, 2020, from drug or device manufacturers to program directors and department chairs of OB/GYN and urology residency programs were compiled from the Centers for Medicare & Medicaid Services Open Payments Database. Statistical analysis was conducted using the Kruskal-Wallis test and a linear mixed-effects model.

Results A total of 19 903 payments, totaling \$6,041,585, were provided to 396 physicians, with a median of \$232.62 per physician over the 6 years analyzed. Urologists received more payments and higher amounts per payment than OB/GYNs (7820 vs 12 083, $P<.01$; \$1,689,519.48 vs \$4,352,066.40, $P<.01$). Department chairs received more payments per year than program directors (8 vs 4, $P<.01$). There were also geographic differences, with higher payments in the Northeast US region (\$131.10 more, $P<.01$). Based on the linear mixed-effects model, 3 variables predicted the magnitude of industry payments received: physician age, number of years in leadership position, and geographic location.

Conclusions Urologists and OB/GYN US residency program directors and department chairs received considerable nonresearch industry payments from 2013 to 2020.

Introduction

Over the past decade, multiple studies have evaluated the relationship between industry payments to physicians and their potential impact on medical practice and training programs.¹⁻⁹ Research has shown that industry payments can influence physicians' practices and prescribing patterns.¹⁰ The magnitude of industry payments in this timeframe exceeds hundreds of millions of dollars.^{1,3-5,7,8} In this context, the term "payments" may refer to a broad range of financial transactions between medical professionals and industry, including compensation for consulting, speaking, or other services, as well as travel, gifts, or other forms of financial support. A 2020 report from the Centers for Medicare & Medicaid Services Open Payments database found that orthopedic surgeons received the highest amount of

industry payments compared with all medical specialties, which totaled over \$480 million.¹¹

Industry payments to physicians can start early while in residency, and a database study in 2020 identified that 47% of orthopedic residents received payments from the pharmaceutical and medical device industries.¹¹ A cross-sectional study identified that, compared to orthopedic surgeons, the median payment dollar value of each payment for OB/GYN subspecialists was greater.⁴ A relationship between an individual physician receiving payments and their role as a graduate medical education (GME) program leader represents a potential conflict of interest. Suppose a physician receives payments from a company with a financial interest in pharmaceuticals or devices that may be used to a lesser or greater degree in a GME program. In that case, the physician may be incentivized to promote certain practices or products that benefit the company, even if they are not in the training program's or residents' best interest. Two older surveys conducted in 2002 found that in emergency medicine programs, just 50% of programs always

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Editor's Note: The online version of this article contains further data from the study.

or very frequently adhered to the Accreditation Council for Graduate Medical Education (ACGME) recommendations for industry funding of core lectures, and 10% always or very frequently allowed pharmaceutical representatives unrestricted access to residents.^{12,13} The ACGME has a requirement that sponsoring institutions “must maintain a policy that addresses interactions between vendor representatives/corporations and residents/fellows,” but it is unclear how this requirement is implemented across all institutions, and there is little recent data on industry money accepted by program directors and department chairs.¹⁴

This study sought to examine payments to program directors and department chairs in urology and OB/GYN, 2 specialties that are similar regarding resident education for performing urinary and reproductive system procedures as well as substantial outpatient patient care. This study initially compared the magnitude of payments between the specialties and then examined factors associated with higher payments.

Methods

Program Directors and Department Chairs

A total of 296 OB/GYN and 146 urology residency programs were identified through the ACGME in December 2021.¹⁵ It was presumed that each residency program had a single program director and department chair for urology or OB/GYN, sometimes referred to as “Women’s Health.” Program directors were identified through the Accreditation Data System on the ACGME website. Department chairs were identified by searching the hospital’s website or contacting the residency program coordinators via email or telephone. The program coordinators were emailed and called 3 times, with voicemails left. After allowing 2 weeks for a response, 30 department chairs were still unidentified (6.7%) and were excluded. After compiling a list of program directors and department chairs, the names were matched to their respective national provider identifier (NPI) number, age, and gender through a manual internet search of various physician profile websites (99% match).¹⁶ Of all the physicians identified, 37 were found to simultaneously hold the program director and department chair positions for their residency program. If individuals held both positions, they were designated as department chairs due to the larger scope of responsibilities. To determine the years each program director or chair held their position from 2013 to 2021 in relation to their payments, information was obtained from the individuals’ LinkedIn Work Experience sections and the ACGME Accreditation Data System. From the LinkedIn Work Experience section,

KEY POINTS

What Is Known

Many physicians receive payment from industry sources, a practice known to influence physician behaviors. As program directors and chairs may in turn influence residents and fellows, it would be illuminating to understand the degree of payments given to those individuals.

What Is New

The total amount of nonresearch payments to leadership in residency programs was high and greatly varied among chairs and program directors in urology and obstetrics and gynecology.

Bottom Line

Residency programs may wish to query publicly available databases to understand potential influence that educational leaders may be under and risk passing on to their learners.

data was gathered regarding each job title, start and end dates, and other relevant information for each position held during the period of interest. The dates were then cross-referenced with payment dates to determine if any payments were received during these jobs. This decreased the sample size by about 20%, and thus the results were recalculated. In some cases, it was necessary to use additional sources of information or contact the individual directly to verify job dates and payment information. Approximately 9000 payments were identified to have occurred before the chair or program director assumed their department leadership positions. These payments, which totaled \$3.1 million, were excluded. The following physicians’ demographics were identified: age, gender, credentials, geographic area of practice, and date appointed to their position (further data provided in online supplementary data).

Payments

Details on drug or device manufacturer payments to OB/GYN and urology program directors and department chairs, from August 1, 2013, to December 31, 2020, were collected from the Centers for Medicare & Medicaid (CMS) Open Payments website.^{17,18} The study period of August 1, 2013, through December 31, 2020, was chosen because, for this period, Open Payments data was available. The database started in August 2013, so this partial year was included. Four payments are considered the threshold for reporting to the CMS Open Payments database because it is the minimum number of payments required to trigger the reporting requirement under the Sunshine Act.¹⁷ The data was then classified into research payments, associated research payments, and general payments from the medical industry to

physicians.¹⁷ The program directors and department chairs were individually matched to their specific industry payments by name, city, state, and subspecialty. Research and associated research payments were excluded from the study. General payments were not associated with research and were therefore referred to as “nonresearch payments.” The nonresearch payments were divided into 7 categories: noncontinuing education programs, consulting fees, honoraria and faculty compensation, food and beverage, charitable contribution, travel and lodging, and royalties (online supplementary data). Nonresearch payments were assessed for each program director and department chair.

Analysis

The Wilcoxon rank sum and Kruskal-Wallis tests were used to analyze the data using R 4.2.1.¹⁹ The Wilcoxon rank sum test, also known as the Mann-Whitney U test, is used when comparing the distribution of a continuous variable between 2 independent groups, particularly in situations where the data may not meet the assumptions of parametric tests like the *t* test. The Kruskal-Wallis test was employed when comparing the distribution of a continuous variable among 3 or more independent groups, allowing for the identification of potential differences without assuming the data follows a specific distribution. Each statistical test was 2-tailed, with a significance level of less than or equal to 0.05. Covariates were selected based on prior knowledge of the relevant literature, theoretical models, and empirical evidence.

A linear mixed-effects model was constructed to identify the predictors of nonresearch payments (online supplementary data). The outcome variable was the natural logarithm of nonresearch payments. Fixed effects in the model included the physician’s age, year, specialty, American College of Obstetricians and Gynecologists (ACOG) District, leadership position, credentials, gender, and number of years in the leadership position. The NPI number was included as a random effect to account for the nesting of observations within physicians. Before analysis, the distributional assumptions of the mixed linear regression model were assessed through visual inspection of residual plots and evaluated for linearity, normality, and homoscedasticity. A log transformation of the yearly payout per person was necessary to meet these assumptions. Before fitting the model, we checked for collinearity among predictors using variance inflation factors, and no problematic multicollinearity was observed.

The use of a mixed linear regression was appropriate for several reasons.²⁰ First, our data exhibited a

hierarchical structure, with repeated measures nested within individual physicians over time. This hierarchical structure introduces potential correlations and dependencies among the observations, which can be adequately accounted for by a mixed model. Second, the mixed model allowed us to model both fixed effects, representing the population-level effects of the predictors, and random effects, NPI number, capturing the individual-level variability and accounting for potential heterogeneity among physicians (online supplementary data). This approach enabled us to simultaneously estimate the overall effects of the predictors and the variation across individuals. Additionally, the mixed model framework facilitated the incorporation of the 8 fixed effects and allowed us to assess the significance of each predictor while controlling for potential confounding factors.²¹ To interpret the coefficients of the categorical predictors in the model, we extrapolated them to get odds ratios. This made the coefficients easier to interpret regarding the percentage increase or decrease in the total payment amount. The statistical significance of the predictors was evaluated using Kenward-Roger approximation for degrees of freedom to compute *P* values.

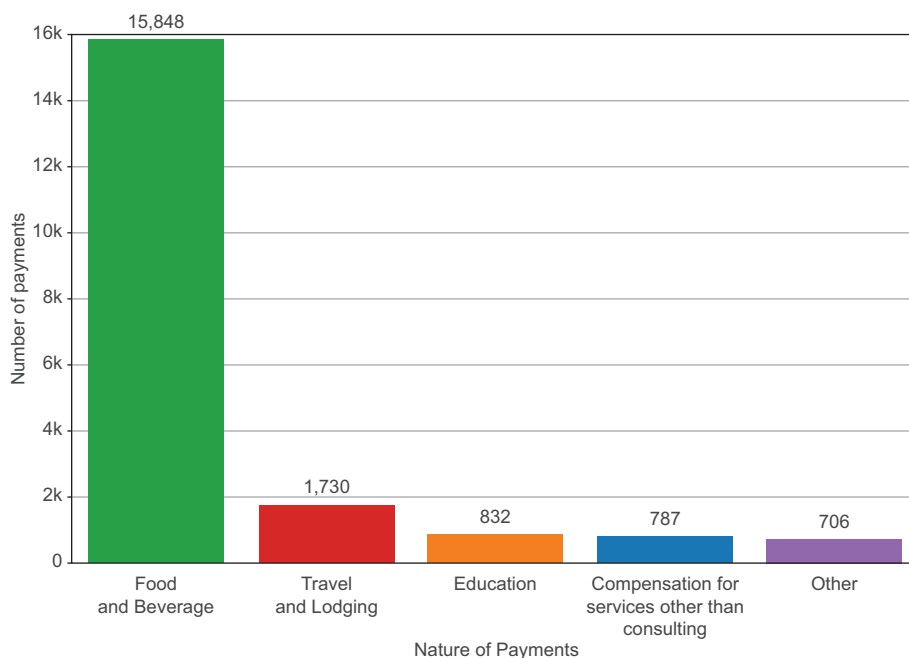
As the CMS database is publicly available, the University of Colorado Institutional Review Board granted an exemption for this study.

Results

Over the 7 years and 5 months analyzed, a total of 19903 individual payments were provided to 396 physicians, of which 253 were OB/GYNs, and 143 were urologists. There were 16 program directors and 0 department chairs who received no payments. The total payments to physicians were calculated after grouping by NPI number and year of payment. This resulted in a median of \$232.62 (IQR \$75.00-\$1,202.44) per physician over the 6 years analyzed while in their leadership position. From 2013 to 2019, there was an upward trend in the total dollar amount received by all physicians as well as in the median number of payments per physician. However, a decline in both variables occurred from 2019 to 2020. The dollar amount received per physician per year dropped by a median of \$110.16 (IQR \$13.38-\$646.37), and the median number of payments per physician decreased by approximately 2 payments.

Nature of Payments

Food and beverage payments were the most common type of nonresearch payment (15848 payments totaling \$576,499; FIGURE 1). Individually, there was a median of 4 (IQR 2-10) separate food and beverage payments totaling a median of \$163.52 per person

**FIGURE 1**

Nature of Payments Made to Physicians in GME Leadership Positions in OB/GYN and Urology

Abbreviations: GME, graduate medical education; OB/GYN, obstetrics and gynecology.

per year (IQR \$58.66-\$420.81). Nonetheless, having accepted a royalty payment was the highest per person and per year, with a median of \$34,268.07 (IQR \$1,856.02-\$72,532.26). In descending order of payments by manufacturers, Ethicon Inc (\$576,255), Coloplast (\$559,924), and Boston Scientific Corporation (\$374,951) were the top 3 companies by the amount paid to both urologists and OB/GYNs.

Specialty

Each OB/GYN received a median of 3 payments per year (IQR 1-9), whereas each urologist received a

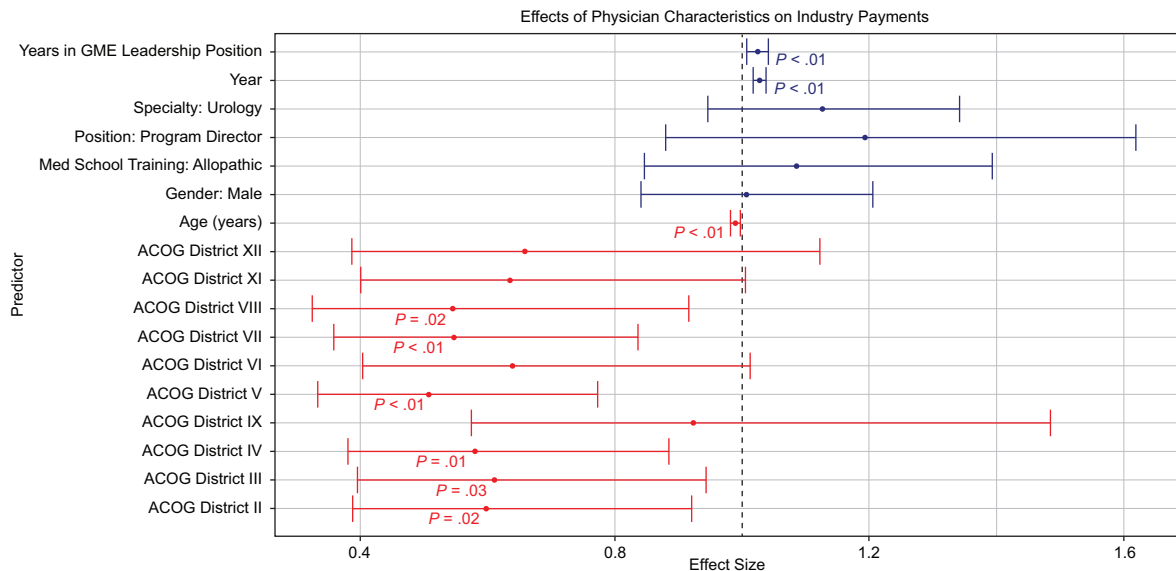
median of 7 payments per year (IQR 2-20, $P < .01$). Compared to OB/GYNs, urologists received significantly more payments (OB/GYNs with 7820 payments vs urologists with 12 083 payments, $P < .01$) and a higher total dollar amount (OB/GYNs totaling \$1,689,519.48 vs urologists totaling \$4,352,066.40, $P < .01$). When these payments were compared by specialty, individual OB/GYN received a median of \$20.11 (IQR \$14.04-\$84.69, $P < .01$) per person per year, compared with urologists who were found to receive a median of \$21.51 (IQR \$13.86-\$93.77) per person per year (TABLE, FIGURE 2).

TABLE

Descriptive Statistics of Industry Payments to OB/GYNs and Urologists in GME Leadership Positions Between 2013 and 2021

Position	Total Payment Amounts, \$	Total Payments, n	Physicians With Payments, n	Median Payments per Physician, \$ (IQR)
OB/GYN				
Chair	\$61,230.03	426	12	\$20.32 (\$15.16-\$76.95)
Program director	\$1,628,289.45	7394	241	\$20.07 (\$13.94-\$85.51)
Urology				
Chair	\$526,908.55	2389	15	\$20.04 (\$13.50-\$72.38)
Program director	\$3,825,157.85	9694	128	\$21.84 (\$13.95-\$98.62)

Abbreviations: OB/GYN, obstetrics and gynecology; GME, graduate medical education.

**FIGURE 2**

Linear Mixed Regression Model of Demographics That Are Predictive of Physicians Receiving More or Less Non-Research Payments

Abbreviations: GME, graduate medical education; ACOG, American College of Obstetricians and Gynecologists.

Position

When the 2 cohorts were analyzed by specialty, the physicians who held the residency program director position received a median of 4 payments per year (IQR 2-12), while those who held the department chair position received a median of 8 payments per year (IQR 3-18). Specifically, each department chair received a median of \$20.12 per year (IQR \$13.86-\$73.60), compared to program directors who received a median of \$21.02 per year (IQR \$13.95-\$93.46; $P < .01$) (TABLE, FIGURE 2). A single urologist received the largest nonresearch payment every year recorded with the largest amount paid to one person in one year at \$629,114.81.

Location

When analyzing industry nonresearch payments by location, ACOG Districts were used to separate physicians who practice in the United States into geographic regions. The total nonresearch payments to physicians differed significantly across the ACOG Districts. When these payments were adjusted for the number of physicians in each District, the largest median nonresearch payments per person per year were in ACOG District VI—Illinois, Iowa, Minnesota, Nebraska, North Dakota, South Dakota, Wisconsin (\$131.10, IQR \$45.72-\$1,164.56) and District XI—Texas (\$114.17, IQR \$108.21-\$1,391.03).

Linear Mixed Regression

Based on the linear mixed effects model results, we found that physician age, calendar year, years in leadership positions, and ACOG District are significant predictors of the nonresearch payments ($P < .01$ for all, respectively, FIGURE 2). For each additional calendar year, the nonresearch payments increased by approximately 2.73% (\$8.40). In comparison, every additional year in a leadership position is associated with an increase in nonresearch payments by approximately 2.41% (\$7.39). In contrast, for each additional year in age, the nonresearch payments decrease by approximately 1.04% (\$3.14). The model also revealed significant associations between the ACOG District and the total amount of payment. Physicians in ACOG District II (New York), III (Delaware, New Jersey, Pennsylvania), IV (Washington DC, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia), V (Indiana, Kentucky, Ohio, Michigan), VII (Alabama, Arkansas, Kansas, Louisiana, Mississippi, Missouri, Oklahoma, Tennessee), and VIII (Alaska, Arizona, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Wyoming) receive lower payments compared to those in District I (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont). Specifically, being in those districts is associated with a decrease in the total amount of payment by approximately \$122 (District II), \$118 (III), \$127 (IV), \$149 (V), \$137 (VII), and \$137 (VIII),

respectively. This geographical finding was different using the linear mixed regression and accounting for all variables compared with the 2-tailed test findings mentioned previously when comparing only geography. The random effect for NPI number was also significant (estimated variance of the random intercept = 0.45 ± 0.67), suggesting that there is considerable variation in the nonresearch payments across different NPIs.

Discussion

This retrospective analysis of industry payments and residency program leadership revealed that, in the most recent calendar years, those who had spent more years in leadership positions and who practiced in ACOG District I (US Northeast) were most likely to receive the highest payments from industry. The amounts and number of payments varied greatly, with some individuals receiving very high payments. Very few program directors received no payments, and no chairs received no payments.

The American Medical Association, the American College of Obstetricians and Gynecologists, the American College of Surgeons, and the American Urological Association have codes of ethics regarding physician financial relationships.²²⁻²⁵ The pharmaceutical industry also has voluntary guidelines from the Code on Interactions with Healthcare Professionals allowing gifts to physicians of up to \$100. The findings in this current study highlight that some physician leaders receive significantly more.²² The finding that practicing in the US Northeast was predictive of physicians receiving more payments and higher payment amounts, in the linear mixed regression model, may be related to large numbers of training programs in this region. Inflation could also explain why the calendar year was predictive of higher payment amounts. For instance, these increased 2.73% per year and annual US inflation varied between 1% and 4% from 2013 to 2020. Another explanation is that medical device and pharmaceutical companies increased their contacts with training programs. However, the payments decreased in 2020, which likely reflects COVID-19 pandemic effects. With increased time in a position, payments increased in number and amount, perhaps related to increasing relationships with industry over time.

The variation in payments to program directors and department chairs is striking, from \$0 to \$629,115 per person, in one year. Department chairs received more payments, and none received no payments: So, does industry specifically target certain physicians, or are some leaders less aware of or concerned about the known effects of industry payments on medical decisions? It is also unknown whether these potential conflicts of interest have more or less impact on residents

if the recipient is the program director, who has more direct and frequent contact with residents, as compared with department chairs.

A limitation of the study is the lack of complete identification of department chairs, and that those individuals holding both positions were counted only as department chairs. Also, some programs, particularly those affiliated with more than one medical institution, may have had more than one department chair, which could underestimate payments. Another source of underestimated payments is that the program directors and department chairs were identified based on them holding those positions at the time of data collection in 2021. The data is analyzed based on how long the physicians identified have held their jobs; however, we were unable to identify physicians who held leadership positions during this timeframe but who were no longer in their positions at the time of data collection. For example, a program director from 2005 to 2016 would not have been included in the data.

As strong evidence supports that payments to physicians, including academic physicians, results in a conflict of interest for best patient care, and that large amounts of industry money flows into urology and OB/GYN training programs, further studies are needed to determine whether interventions can mitigate these potential effects on residents. These might include lower limits on payments or full disclosure of payments to residents, including residency applicants. Also, studies might compare high-payment to low-payment programs for post-residency physician attitudes and prescribing performance. Other specialties, particularly surgical specialties, should examine recent payments to faculty closely aligned with residency programs.

Conclusions

Based on our analysis, 3 variables predicted the magnitude of industry payments received: more years in leadership positions, geography, and more recent calendar year the payments were received. The total amount of nonresearch payments to leadership in residency programs was high and greatly varied among physicians.

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