

Plastic Surgeons' Perceptions of Financial Conflicts of Interest and the Sunshine Act

Taylor E. Purvis, BA*
Joseph Lopez, MD, MBA*
Jacqueline Milton, PhD†
James W. May Jr, MD‡
Amir H. Dorafshar, MBChB,
FACS, FAAP*

Background: It is unknown whether recent legislation known as the Physician Payments Sunshine Act has affected plastic surgeons' views of conflicts of interest (COI). The purpose of this study was to evaluate plastic surgeons' beliefs about COI and their comprehension of the government-mandated Sunshine Act.

Methods: Plastic surgeon members of the American Society of Plastic Surgeons were invited to complete an electronic survey. The survey contained 27 questions that assessed respondents' past and future receipt of financial gifts from industry, awareness of the Sunshine Act, and beliefs surrounding the influence of COI on surgical practice.

Results: A total of 322 individuals completed the survey. A majority had previously accepted gifts from industry ($n = 236$; 75%) and would accept future gifts ($n = 181$; 58%). Most respondents believed that COI would affect their colleagues' medical practice ($n = 190$; 61%) but not their own ($n = 165$; 51%). A majority was aware of the Sunshine Act ($n = 272$; 89%) and supported data collection on surgeon COI ($n = 224$; 73%). A larger proportion of young surgeons believed patients would benefit from knowing their surgeon's COI ($P = 0.0366$). Surgeons who did not expect COI in the future believed financial COI could affect their own clinical practice ($P = 0.0221$).

Conclusions: Most plastic surgeons have a history of accepting industry gifts but refute their influence on personal clinical practice. Surgeon age and anticipation of future COI affected beliefs about the benefits of COI disclosure to patients and the influence of COI on surgical practice. (*Plast Reconstr Surg Glob Open* 2018;6:e1733; doi: 10.1097/GOX.0000000000001733; Published online 4 April 2018.)

INTRODUCTION

Patients and policymakers are becoming more aware of potential financial conflicts of interest (COI) between surgeons and the medical industry.¹ Within plastic surgery, national organizations in the United States such as the American Society of Plastic Surgeons (ASPS) have de-

veloped COI policies that require leaders in the organization to disclose potential COI.² The Physician Payments Sunshine Act (PPSA) that became federal law in January 2012 under the 2010 Affordable Care Act was both a response to this increased awareness and a call for improved transparency of potential COI in health care.³ The Act requires pharmaceutical and biomedical manufacturers to report annually on direct payments and other "transfers of value" made to physicians and teaching hospitals to the Centers for Medicare and Medicaid Services. In September 2014, the information on amounts received by

From the *Department of Plastic and Reconstructive Surgery, Johns Hopkins Hospital, Baltimore, Md.; †Boston University School of Public Health, Boston, Mass.; and ‡Division of Plastic & Reconstructive Surgery, Massachusetts General Hospital, Boston, Mass.

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Ms. Purvis and Dr. Lopez contributed equally to this work.

Institution to which work should be attributed: Department of Plastic and Reconstructive Surgery, Johns Hopkins Hospital, 1780 E. Fayette St Bloomberg 7th Floor Rm 7314, Baltimore, MD 21231.

IRB Approval: This study was approved by our hospital Institutional Review Board (IRB00091046).

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individual physicians was made available on a publicly accessible Open Payments Database web site.

Previous survey research conducted before the Sunshine Act has produced conflicting information on the views of physicians surrounding COI. Surveys among surgeons and internists reveal that a majority in both groups consider industry-sponsored research to be biased.⁴ In the same study, a minority of surgeons was found to believe that physicians presenting at Continuing Medical Education–accredited events should be required to disclose financial agreements with companies.⁴ Consistent with these findings, surveys have also shown that physicians consider interactions with pharmaceutical representatives as productive and informative. However, many also believe that financial relationships with biomedical companies may introduce biased research findings among their physician peer groups.^{5–8} Physician opinions about gifts from pharmaceutical companies remain conflicted: while gifts may increase awareness about new therapies⁹ and are generally considered acceptable,¹⁰ physicians may not desire to make these gifts known to the general public.¹¹

Research within plastic surgery using the Sunshine Act Open Payments Database suggests that approximately half of all plastic surgeons receive payments from drug or device manufacturers.^{12,13} Investigation of COI is particularly timely due to the large increase in funding by biomedical and pharmaceutical companies in response to sequestration and other federal funding research funding cuts.¹⁴ This growth in industry spending, combined with the information now made publicly accessible by the Sunshine Act, necessitates a study to evaluate current views of plastic surgeons surrounding financial COI.

Currently, it is unknown how plastic surgeons perceive COI in the wake of the recent Sunshine Act legislation. The purpose of this study was to assess the views of plastic surgeons about financial COI and to evaluate their understanding of the Sunshine Act. We hypothesize that a majority of plastic surgeons will have a favorable perception of COI. Furthermore, we hypothesize that views on COI and the Sunshine Act will be dependent on surgeon demographic factors and awareness regarding the influence of financial COI. Therefore, the aims of this study were to (1) survey plastic surgeon members of the ASPs; (2) assess surgeons' awareness of and views on COI; (3) assess plastic surgeon awareness and views regarding the Sunshine Act; (4) evaluate how age influences views on COI; and (5) evaluate whether previous interactions or anticipated future engagements with biomedical industry influence views on COI and the Sunshine Act.

MATERIALS/PATIENTS AND METHODS

Study Design/Subjects/Setting

This was a cross-sectional study of plastic surgeons, both in academic and private practice, who are active members of the ASPs. Under ASPs survey distribution policy, approximately half of the “active” ASPs members (2,479 of 5,800 total active members) were randomly selected to receive an electronic survey.¹⁵ An active member is defined by ASPs as a plastic surgeon who is board certified by the American Board of Plastic Surgery, has completed the

ASPs Membership process, and pays annual dues. Not included in this cohort are residents and fellows, associate/affiliate members, life members, life inactive members, and international members. Between June 2016 and August 2016, subjects were e-mailed an invitation by ASPs to complete an electronic survey. The purpose identified in the invitation was to “assess the views of plastic surgeons toward financial COI within their field, in addition to evaluating the surgeon's understanding of the PPSA, which became federal law in 2012.” Two reminder e-mails were sent to subjects after the initial survey invitation.

Survey Design

The survey instrument was informed by reviewing the literature on COI and the Sunshine Act.^{4,5,16,17} It was designed to solicit surgeons' perspectives on financial COI and their awareness of the Sunshine Act. Input from colleagues with expertise in survey design and from the ASPs staff was also solicited in developing the survey. A draft survey instrument was subjected to multiple rounds of edits and modifications to ensure clarity. To avoid the negative connotation associated with the phrase “conflicts of interest,” the instrument instead used descriptive and less judgmental terms such as “gift/monetary compensation,” or “financial ties” (eg, “Do you think that accepting gifts/monetary compensation affects your colleagues' choice of instruments, devices, supplies, or medications they use or recommend for a surgery ...”). The final survey contained 27 questions (see survey, Supplemental Digital Content 1, which displays the survey to assess the views of plastic surgeons towards financial COI within their field, <http://links.lww.com/PRSGO/A723>). Questions for surgeons focused on the following areas: practice demographics, current and future receipt of financial gifts from industry, knowledge of the Sunshine Act, and attitudes surrounding the influence of COI on clinical practice.

Data Collection

Surgeons were ensured confidentiality through an approved survey collection application that recorded results anonymously. This study was approved by our hospital Institutional Review Board (IRB00091046).

Data Analysis

Demographics are summarized using frequencies and proportions. To examine the associations between survey questions and patient demographics, a chi-square test of independence was used. To control for a potential inflated type I error rate, *P* were adjusted using a false discovery rate of 0.05. All statistical analyses were performed using SAS v9.3. Adjusted *P* values less than 0.05 were considered statistically significant.

RESULTS

Demographic Information

A total of 322 individuals completed the survey, resulting in a response rate of 13.0% (total *n* = 2,479). A majority of respondents were male (*n* = 260; 81%) and practicing

Table 1. Demographics

Characteristics	N (%)
Sex	
Female	62 (19.3)
Male	260 (80.7)
Age (y)	
Under 44	78 (24.2)
45–54	91 (28.3)
55–64	100 (31.1)
65 and above	53 (16.5)
Years in practice	
Fewer than 9	73 (22.7)
10–19	84 (26.1)
20 or more	165 (51.2)
Region of primary practice	
West	79 (24.5)
Midwest	53 (16.5)
South	129 (40.1)
Northeast	61 (18.9)
Type of clinical practice	
100% Reconstructive	41 (12.9)
Mix of cosmetic and reconstructive	207 (65.3)
100% Cosmetic	69 (21.8)
Primary focus of practice	
Microsurgery, general reconstruction, or breast	131 (41.2)
Pediatrics, craniomaxillofacial, or head and neck	21 (6.6)
Aesthetics	146 (45.9)
Hand	20 (6.3)
Current practice type	
Solo or small practice	214 (67.3)
Medium or large practice	46 (14.5)
Academic practice or military	58 (18.2)
If in academic practice, performs research more than 10% of the time	
No (≤ 10%)	40 (71.4)
Yes (> 10%)	16 (28.6)

in a mixed cosmetic and reconstructive clinical practice (n = 207; 65%; Table 1). Solo or small private practices were most common (n = 214; 67%) with a focus on microsurgery, general reconstruction, or breast surgery (n = 131; 41%) or aesthetics (n = 146; 46%).

Surgeon Awareness of COI

The majority of surgeons had a history of engaging with the biomedical industry (n = 236; 75%; Table 2). Most agreed that they would accept gifts in the future (n = 181; 58%). They reported being willing to receive almost all types of gifts, in particular food/beverages, travel/lodging, consulting fees, and speaker fees (n = 162, 92%; n = 120, 67%; n = 116, 65%; and n = 109, 61%, respectively).

Surgeon Views on COI

Most surgeons believed that patients were not interested in knowing about the financial relationship of their providers with biomedical companies (n = 198; 66%; Table 3). When asked whether financial COI would influence their own medical practice, approximately half of the respondents said no (n = 165; 51%). However, a majority of respondents agreed that financial COI would affect the medical practices of their colleagues (n = 190; 61%). Surgeons did not consider all types of COI to be equally influential on provider behavior. Being an employee of a company (n = 94; 52%) and receiving royalties or owning stock (n = 51; 28%) were seen as the most influential forms of financial relationships.

Table 2. Surgeon Awareness of COI

Statement/Question	N (%)
<i>I have accepted gifts/monetary compensation from a pharmaceutical/biomedical company (any gift of value, ranging from coffee at a meeting to research support)</i>	
Agree	236 (74.7)
Disagree	80 (25.3)
<i>Describe the types of gifts which you have received (all that apply)</i>	
Consulting services	60 (25.6)
Being an employee of a company	2 (0.9)
Royalties	9 (3.9)
Research funding	37 (15.8)
Speaker services	51 (21.8)
Travel/lodging	87 (37.2)
Food/beverage	216 (92.3)
Direct financial gifts or monetary compensation	15 (6.4)
<i>Do you foresee yourself accepting gifts/monetary compensation from pharmaceutical/biomedical companies in the future?</i>	
Agree	181 (57.5)
Disagree	134 (42.5)
<i>Describe the type of gifts/compensation you would be willing to accept (select all that apply)</i>	
Consulting services	116 (64.8)
Being an employee of a company	41 (22.9)
Royalties	66 (36.9)
Research funding	76 (42.5)
Speaker services	109 (60.9)
Travel/lodging	120 (67.0)
Food/beverage	164 (91.6)
Direct financial gifts or monetary compensation	40 (22.4)

Surgeon Views on the Sunshine Act

Most respondents agreed that it is appropriate for regulatory organizations to collect COI data on surgeons (n = 224; 73%; Table 4). However, there was disagreement as to whether these agreements should be reported to a government agency (n = 150 agreed; 50%) or whether the database should be made public (n = 132 agreed; 44%). Most respondents agreed that only certain types of COI (n = 181; 56%) or certain amounts (n = 163; 54%) should have reporting requirements.

Association between Age and Views on COI/Sunshine Act

The age of respondents affected whether they agreed that patients will make more informed decisions if they know the COI of their surgeon (P = 0.0366; Table 5). Age also affected whether respondents saw themselves accepting compensation from companies in the future, with fewer older surgeons foreseeing future gifts (P = 0.0090).

Association between Biomedical Financial Ties and COI

Surgeons with prior financial ties to biomedical companies believed that financial COI affect colleagues' practice patterns (P = 0.0228) but had no influence on their own practices (P = 0.0221). However, the majority also believed that only certain types of compensation from industry need to be reported (P = 0.0090). Of those respondents who did not see themselves accepting compensation from companies in the future, 66% believed there should be requirements about or monitoring of the amount of gifts clinicians can receive. Surgeons who anticipated not having future engagements with industry also believed that colleagues' (P < 0.0001) or their own (P < 0.0001) practices could be influenced by industry relationships (Table 6).

Table 3. Surgeon Views on COI

Statement/Question	N (%)	
	Agree	Disagree
A. Views on patients' perception		
<i>Have patients ever previously inquired about your acceptance of any gifts/monetary compensation from pharmaceutical/medical device companies?</i>	19 (6.2)	286 (93.8)
<i>Patients care about knowing the financial relationship of their physician/surgeon with pharmaceutical/biomedical device companies.</i>	102 (34.0)	198 (66.0)
<i>Patients will be able to make more informed decisions about their healthcare by knowing the financial interests of physicians/surgeons.</i>	99 (33.0)	201 (67.0)
B. Views on influence of COI on physician behavior		
<i>Accepting gifts/monetary compensation affects your colleagues' choice of instruments/devices/supplies/medications they use or recommend for treatment</i>	190 (60.5)	124 (39.5)
<i>Accepting gifts/monetary compensation is likely to influence the instruments/devices I use or recommend for a patient's treatment</i>	140 (45.9)	165 (50.6)
Statement	N (%)	
C. Differential views on COI types		
<i>Assuming that different types of financial relationships can have different degrees of influence on physicians/surgeons, indicate which relationship is the most influential:</i>		
Consultant	16 (8.8)	
Food/beverage/travel support	12 (6.6)	
Recipient of royalties/stock owner	51 (28.0)	
Research support	9 (5.0)	
Employee	94 (51.7)	
<i>Physicians/surgeons who receive gifts/monetary compensation from pharmaceutical/biomedical device companies should be required to disclose the following amount:</i>		
Any gift	27 (16.7)	
\$1–100	3 (1.9)	
\$101–1,000	28 (17.3)	
\$1,001–10,000	62 (38.3)	
\$10,001–100,000	37 (22.8)	
> \$100,001	5 (3.1)	
<i>The following types of financial relationships should be reported/monitored (select all that apply):</i>		
Consulting services	123 (68.3)	
Being an employee of a company	169 (93.9)	
Royalties	155 (86.1)	
Research funding	112 (62.2)	
Speaker services	115 (63.9)	
Travel/lodging	54 (30.0)	
Food/beverage	10 (5.6)	
None	3 (1.7)	
Other	13 (7.2)	

DISCUSSION

Engagement between surgeons and industry is necessary. Prior research has demonstrated that industry plays a role in all aspects of medical research, such as sponsoring medical device and pharmaceutical clinical trials supervised by clinicians, providing reimbursement for physicians in consulting and speaking roles, and subsidizing

medications for patients who would not ordinarily be able to afford treatment.^{18,19} Industry supports nearly 65% of all medical research in the United States.²⁰ One study found that in a national sample of over 3,100 clinicians, 94% reported a relationship with industry.²¹ Another national survey reported that 92% of physicians had received free pharmaceutical samples in the past, and 61% received travel or food at no cost.²² Our analysis revealed that the majority of surgeons surveyed (> 70%) disclosed having prior financial ties to industry. This is an even higher number than that reported in a recent study by Chao and Gangopadhyay,¹³ which found that over 54% of all plastic surgeons in the United States had received payments from a biomedical company in 2014.

Although the prevalence of financial relationships between biomedical companies and plastic surgeons is significant, no prior study has assessed how plastic surgeons perceive these relationships. Furthermore, with the passage of the Sunshine Act, it is unknown how physicians perceive this new regulatory legislation aimed at providing transparency to physician-industry financial transactions. In our study, the majority of respondents noted the potential influence that financial COI could have on medical practice and research. In fact, respondents with no prior history of COI were more likely to believe (> 70%) that accepting compensation from industry is likely to influence patient management. Moreover, the majority of respondents believed that it was “appropriate for a private or governmental organization” to collect financial COI information from physicians. These findings suggest that plastic surgeons believe that COI influence physician behavior and that COI need to be managed appropriately. Indeed, a multitude of previous studies has found that financial COI have widespread implications for the health care system. COI are associated with the publication of positive research findings,^{6,23,24} including among plastic surgery investigators.²⁵ COI also potentially affect national specialty guidelines. A 2011 *British Medical Journal* article reported that a large percentage of guideline panelists have substantial financial relationships with industry.²⁶ Finally, COI have been shown to influence prescribing practices^{27,28} and the use of new surgical equipment that lacks safety and efficacy data.²⁹ Wazana³⁰ demonstrated a positive association between attending a drug company-sponsored continuing medical education program and the rates of prescribing the company's medication.

Our study demonstrated that most surgeons believe they are immune to bias. More specifically, our analysis revealed that surgeons who anticipate having financial ties with industry believe that monetary compensation from industry is less likely to influence their treatment of patients when compared to colleagues (35.4% versus 51%). This mindset, as it pertains to COI, has also been shown in other specialties. In a survey of community obstetricians-gynecologists, Morgan et al.³¹ reported that respondents believed their peers were more likely to be swayed by drug samples than they were themselves (38% versus 33%). Steinman et al.¹⁰ surveyed medicine housestaff and found that 61% of residents believed they were immune to the influences of COI, whereas only 16% believed their

Table 4. Surgeon Views on the Sunshine Act

Statement/Question	N (%)	
	Yes	No
<i>Is it appropriate for a private or governmental entity (eg, biomedical device company, government, hospital, etc.) to disclose your or your colleagues' gift/monetary compensation received from pharmaceutical/medical device companies?</i>	224 (73.4)	81 (26.6)
<i>Were you aware of the Sunshine Act before taking this survey?</i>	272 (89.2)	33 (10.8)
<i>Have you used the Sunshine Act Open Payments database to evaluate financial ties between pharmaceutical/biomedical device companies and your colleagues or yourself?</i>	76 (24.9)	229 (75.1)
<i>Physicians/surgeons and pharmaceutical/biomedical device companies should be mandated to report all financial ties to a government agency</i>	150 (50.0)	150 (50.0)
<i>There should be reporting requirements/monitoring on how much physicians/surgeons can receive in gifts/monetary compensation</i>	163 (54.3)	137 (45.7)
<i>There should be reporting requirements/monitoring for only certain types of gifts/monetary compensation that physician/surgeons receive from industry</i>	181 (55.5)	117 (35.9)
<i>It is necessary to make such a database public to all?</i>	132 (44.0)	168 (56.0)

Table 5. Association between Age and Views on COI/Sunshine Act

Question	Age (y)	Response to Question (%)	P
<i>Patients will be able to make more informed decisions about their healthcare by knowing the financial interests of physicians/surgeons</i>	Under 45	78.1	0.0366
	45–54	29.3	
	55–64	40.0	
	65 and above	42.0	
<i>Do you foresee yourself accepting gifts/monetary compensation from pharmaceutical/biomedical companies in the future?</i>	Under 45	63.6	0.0090
	45–54	57.7	
	55–64	67.0	
	65 and above	30.2	

peers could similarly avoid alterations in their behavior. Keim et al.⁹ showed that only 49% of emergency room residents believed that their prescribing patterns could be influenced by drug marketing, whereas 75% of their attending physicians believed this advertising affected the

residents' behavior. Our results suggest that ideas about future behavior—namely, whether surgeons expected to interact with the biomedical industry—may influence how surgeons perceive gifts from industry.

Most surgeons we surveyed agreed that not all COI have equal weight. Most respondents believe that only certain types or amounts of financial relationships need to be disclosed (> 55%). This is consistent with previous findings from our group that showed that only certain types of COI in plastic surgery research are associated with a positive publication bias. In particular, authors in the plastic surgery literature disclosing COI related to research funding, consultant or employee positions, and royalties or stock options were 1.31, 6.62, and 8.72 times more likely, respectively, than authors without COI to report positive research results. Holding consultantship or employee positions had a statistically significant association with the publication of positive research findings ($P < 0.001$).²⁵ These findings suggest that certain relation-

Table 6. Association between History of Having or Willingness to Have Financial Ties with Biomedical Companies and Views on COI/Sunshine Act

Question	History of Financial Ties to Biomedical Companies	Response to Question	P	
A.	<i>Accepting gifts/monetary compensation affects your colleagues' choice of instruments/devices/supplies/medications they use or recommend for treatment</i>	No	71.3	0.0228
		Yes	56.8	
	<i>Accepting gifts/monetary compensation is likely to influence the instruments/devices I use or recommend for a patient's treatment</i>	No	57.1	0.0221
		Yes	42.1	
	<i>There should be reporting requirements/monitoring for only certain types of gifts/monetary compensation that physician/surgeons receive from industry</i>	No	48.5	0.0090
		Yes	65.0	
<i>There should be reporting requirements/monitoring on how much physicians/surgeons can receive in gifts/monetary compensation</i>	No	56.0	0.7379	
	Yes	53.8		
Question	Anticipate Having Financial Ties with Biomedical Companies	Response to Question (%)	P	
B.	<i>Accepting gifts/monetary compensation affects your colleagues' choice of instruments/devices/supplies/medications they use or recommend for treatment</i>	No	73.1	< 0.0001
		Yes	51.1	
	<i>Accepting gifts/monetary compensation is likely to influence the instruments/devices I use or recommend for a patient's treatment</i>	No	60.0	< 0.0001
		Yes	35.4	
	<i>There should be reporting requirements/monitoring for only certain types of gifts/monetary compensation that physician/surgeons receive from industry</i>	No	40.9	0.0047
		Yes	27.2	
	<i>There should be reporting requirements/monitoring on how much physicians/surgeons can receive in gifts/monetary compensation</i>	No	66.7	0.0180
		Yes	45.7	

Bold indicates $p < 0.05$

ships with industry—in particular surgeons holding consultant or employee positions—may be most critical to report under the Sunshine Act. Moreover, it may suggest that journal editorial boards should focus their energy on defining and highlighting COI that are at higher risk for bias, and making these clear to the scientific readership. Such changes may improve the effectiveness and efficiency of COI disclosures in biomedical science.

There are limitations to our study. Our response rate was low at 13.0% of the randomly selected cohort of active ASPs members. Although this number may seem low, existing research using ASPs surveys have typically recorded a response rate of between 9.1% and 25%.^{32–35} Our study may also have had a selection bias; respondents who read the e-mail prompt before agreeing to participate may have been more likely to have polarized opinions on the topic of COI. However, our study benefited from collecting data from the largest plastic surgery specialty group in the United States.¹⁵ Furthermore, our sample was highly representative of a variety of geographic locations, practice types, and years of experience (as shown in Table 1), so we believe that the effects of a selection bias may not be substantial. The distribution of respondent age³⁶ and practice location³⁷ among respondents was similar to previous studies describing these characteristics among practicing plastic surgeons.

Most plastic surgeons agree that financial COI are important determinants of physician behavior and should be regulated appropriately. Additionally, our report reveals that plastic surgeons view favorably the role of transparency in managing the physician-industry relationship. Although there may be disagreement regarding how regulation of COI should be structured and managed, plastic surgeons believe that transparency is important to ameliorate the deleterious effects of COI on physician behavior and research. Unfortunately, recent studies and findings suggest that current COI disclosures in journal articles and the PPSA database are inaccurate and potentially misleading.^{38,39} Therefore, our results highlight the importance of improving transparency in biomedical science and the need for our professional societies, journal editorial boards, and government entities to enact new mechanisms aimed at improving the effectiveness of COI disclosures throughout biomedical science. New regulatory tools such as author penalties for inaccurate disclosures (e.g., future publishing restrictions), independent auditing systems aimed at ensuring COI disclosure accuracy, or the tagging of scientific articles with new “Level of Conflict-of-Interest” labels to designate the types of COI reported (eg, dollar amount paid to authors) similar to the tagging of articles with Level of Evidence labels may be necessary.⁴⁰ Of note, Centers for Medicare and Medicaid Services has begun several educational initiatives that seek to improve physician awareness of the Sunshine Act, including continuing medical education modules, monthly industry forums, and a mobile phone application.¹⁶ These efforts may result in more widespread familiarity with the Open Payments program in the future and assist in improving its accuracy. Given plastic surgeons’ long-standing history of innovation and strong industry-surgeon part-

nerships, we believe that plastic surgery is uniquely poised to develop effective regulatory mechanisms aimed at improving COI transparency to our deserving patients, colleagues, and the general public.

CONCLUSIONS

A majority of surgeons surveyed have a history of accepting gifts from the biomedical industry and would accept such gifts in the future. A majority believed that financial COI would affect their colleagues’ choice of medical treatment but not their own medical practices. Most surgeons were aware of the Sunshine Act and agreed that regulatory bodies should compile data on surgeon COI. Young surgeons (< 45 years of age) believed that patients would benefit from knowing their surgeons’ financial COI. Surgeons who did not anticipate receiving gifts from industry in the future believed financial COI could influence their own or their peers’ surgical practice. These survey results suggest that plastic surgeons agree that more must be done to improve COI transparency in biomedical science.

Joseph Lopez, MD, MBA

Department of Plastic Surgery
Johns Hopkins Hospital
1780 E. Fayette St Bloomberg 7th Floor Rm 7314
Baltimore, MD 21231
E-mail: Jlopez37@jhmi.edu

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