

Residents' Perceptions Over Time of Pharmaceutical Industry Interactions and Gifts and the Effect of an Educational Intervention

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Abstract

Purpose

To describe change in residents' attitudes toward gifts from and interactions with industry and to measure the effects of a formal educational workshop on changes in perceptions.

Method

At the University of Chicago, 118 internal medicine residents completed an observational survey and took part in a controlled intervention across three years (2001–2004) of residency. Four cohorts of residents completing the program in 2004–2007 participated. The intervention was an interactive educational workshop, including reviews of literature and guidelines, and three videos demonstrating routine resident interactions with pharmaceutical representatives. Residents graduating in

2005 were the intervention group and residents graduating in 2004 the comparison group. Analysis of variance and linear regression models were used to determine the relationship between variables.

Results

Residents perceived "lunch sponsored at noon conference" and "pharmaceutical representative brief talk at noon conference" as increasingly appropriate over their training period ($p < .02$). Residents perceived "pens, notepads, pocket antibiotic guides" as increasingly appropriate and "tickets to sporting events," "round of golf," and "travel/registration for national conference" as increasingly inappropriate ($p < .05$). The intervention group was more likely to rate only one item, "lunch at noon

conference," as less appropriate ($p = .042$).

Conclusions

Residents' perceptions toward industry gifts and interactions changed modestly during their training to reflect institutional policy. "Appropriate" gifts of minimal value were generally perceived as increasingly appropriate, whereas "inappropriate" gifts were perceived as increasingly inappropriate over time. An educational workshop alone may not significantly alter residents' perceptions toward industry without the implementation of broad and consistent institutional policy.

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Professional organizations,^{1,2} medical educators,³ student groups,⁴ health care providers,⁵ and industry⁶ have all issued guidelines to regulate the interaction between physicians and the pharmaceutical industry. Studies

demonstrate that these interactions are widespread⁷ and can potentially alter physicians' behavior⁸ in terms of recommending patient care. Any gift from industry to physicians can influence behavior and represents a potential conflict of interest.^{9–11} However, guidelines range from recommending that no personal gift be accepted (e.g., American Medical Students Association guidelines⁴ and the "No Free Lunch" movement⁵) to the permission of modest gifts that primarily benefit patients.^{1,2,6} Although the Accreditation Council for Graduate Medical Education (ACGME) recommends that residency training occur in an environment "free of influence," individual programs are left to determine their own policies governing these interactions. Yet the ACGME does universally recommend formally instructing residents regarding physician–industry interactions.¹²

The effect of professional guidelines and formal instruction during training on

residents' perceptions toward industry influence over time is uncertain. Moreover, how these perceptions change during residency training is unknown. Most studies of residents and industry have been cross-sectional surveys that examine interactions between residents and pharmaceutical representatives and the acceptability of gifts to residents.^{13–16} Some have shown the effect of industry interactions on physicians' prescribing patterns.^{17,18} A lack of formal curricula on the issue⁷ and the ubiquity of modeling superiors as a way of training may determine residents' behavior over time.¹⁹ Yet the effect of guidelines directing future behavior demonstrate conflicting results such as such as contact with pharmaceutical representatives.^{20,21} Studies that have tracked residents over the training period are absent. While many educators, as well as the ACGME, call for training residents on the critical interaction with industry,^{9,17,22,23} to our knowledge few studies have examined the

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effects of an educational intervention on the interaction.^{24–27} These studies are limited by a lack of significant follow-up^{24,27} and small sample sizes.²⁵

Our study therefore had two objectives:

- (1) To prospectively describe any direction and magnitude of change in residents' perceptions toward the pharmaceutical industry during their training. We hypothesized that perceptions would change over the course of residency training and that the direction of change would be consistent with institutional residency policy toward industry gifts and interactions.
- (2) To determine whether a workshop to educate residents about policies and recommendations to guide their interactions with industry affected the perceived appropriateness of both interactions and gifts over their three-year training period. We hypothesized that overall, gifts from and interactions with industry would be viewed as less appropriate over time by the cohort receiving the educational workshop than by the control cohort, who did not participate in the workshop, with the direction of change remaining constant.

Method

Setting and participants

The University of Chicago (UC) Internal Medicine training program is a three-year program with an annual incoming class of approximately 30 interns. Of these

residents, 75% choose categorical internal medicine, 19% select preliminary, and 6% choose medicine–pediatrics. The majority of clinical activities, 31 of 33 months, are spent at the University Hospital. Interactions between residents and industry representatives do not occur at the primary care clinics.

The program policy that governs UC Internal Medicine residents' interaction with industry was formally adopted in 2001 and is based upon the American Medical Association (AMA) guidelines for Gifts to Physicians from Industry. The appropriateness of gifts that can be received by UC residents closely follows AMA Opinion 8.061, "Gifts to Physicians from Industry," where personal gifts that were appropriate "should primarily entail a benefit to patients," "should not be of substantial value," should "be related to housestaff work," and should "serve a genuine educational function."²⁸ Industry-sponsored social events, food or gifts outside formal educational gatherings, and personal gifts of substantial worth (e.g., over \$100 in value) are considered violations of UC Internal Medicine housestaff policy and are considered by program leaders to be "inappropriate." In addition to Opinion 8.061, the UC Internal Medicine Program set limits on in-hospital interaction of residents with pharmaceutical representatives to designated noon-time conferences, including a journal club, and a board review series. This policy was presented in 2001 to all residents during a mandatory teaching conference. A discussion of the policy has been included in intern orientation since the

policy's inception and the written policy is distributed. Reminders of the policy also occur annually, as directed by the chief residents, when classes are in the planning stages of social events such as "Interns' Day Off." When we met with program leaders, they were not aware of any transgressions of policy during the study period. Prior to this study, no explicit formal policy or guidelines existed at UC concerning the appropriateness of industry–resident interactions. Departmental policies that governed the relationships between residents and industry remained constant over the three-year study period.

Design

We used two overlapping designs to address the study's two objectives. First, we implemented an observational design to study residents' attitudes at different stages of their training. We surveyed all residents who were in training from 2001 to 2004 starting with the incoming interns of 2001 and collected data annually (Figure 1). Second, we used a controlled intervention design to study the effect of an educational workshop. The workshop began in 2002 as part of the orientation for the cohort graduating in 2005. We used the cohort graduating in 2005 as the intervention group and the cohort graduating in 2004 as a comparison group. The workshop was subsequently part of the orientation of each incoming residency cohort.

Survey instrument

We recorded residents' perceptions of interactions with and gifts from pharmaceutical representatives through a written questionnaire. Questionnaire items included indicating the appropriateness of interactions with industry representatives such as "lunch at noon conference" and gifts such as "textbooks" and a "round of golf," all of which had occurred at UC within the preceding two years. We adapted specific items from previous studies or developed them from well-established guidelines that address the interactions between physicians and industry.^{13,16,25,29} Respondents rated all items on a 4-point scale where 1 = "very inappropriate" and 4 = "very appropriate." The outcome variables we chose for this questionnaire were all possible interactions or gifts that the residents may have been exposed to prior to the inception of the study. We

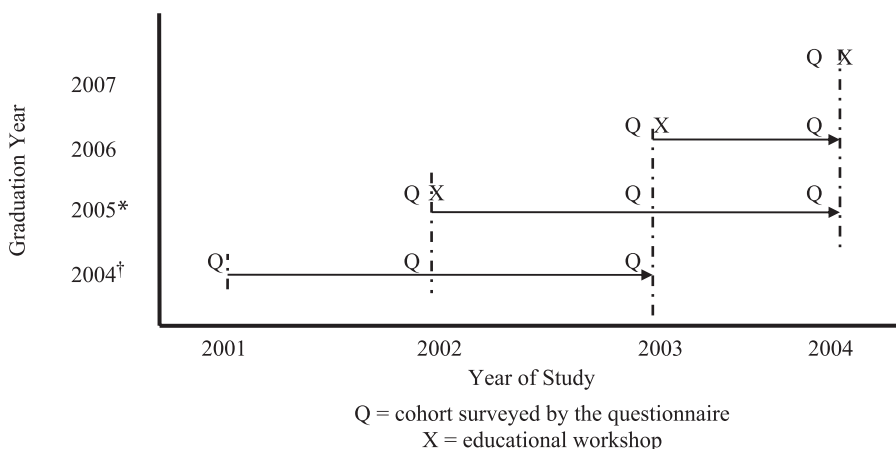


Figure 1 Survey over time of four resident cohorts regarding perceptions of pharmaceutical industry gifts, by graduation year.

*For the educational workshop portion of the study, the 2005 cohort is the intervention group.

†For the educational workshop portion of the study, the 2004 cohort is the control group.

instructed survey respondents to rate levels of appropriateness based upon their personal beliefs; thus we elicited measurements of the residents' reflective ethical judgments rather than their judgments in light of a standard or guideline.

In Figure 1, the questionnaire (noted by a "Q") indicates the administration of the written questionnaire during a specific year to a specific cohort of residents. We conducted nine survey sessions during a scheduled conference or formal orientation to the following year of training (e.g., intern orientation for incoming interns, senior resident orientation for rising second-year residents). All orientations and conferences were held annually between April and July. In years where the workshop occurred, we collected the questionnaire data before the start of the workshop. The questionnaires were completed anonymously and without unique identifiers. We used a roster of attendees to confirm participation and obtained verbal informed consent from participants. The questionnaire and study design was approved by the UC institutional review board.

We used the UC Internal Medicine program policy instituted in 2001 to classify each interaction and gift addressed in the questionnaire as either "appropriate" or "inappropriate." We then used this classification to group outcomes and to characterize change regarding an outcome. For example, textbooks are considered to be "appropriate" by the program policy; therefore, we considered residents' changes in perceptions over time as more or less appropriate. A gift of a round of golf is considered "inappropriate" by the program policy; accordingly, we reported changes in perceptions regarding golf as more or less inappropriate over time.

Educational workshop

The workshops were taught by three of the authors (JS with assistance from VA and HH). The primary aim of the workshop was to increase residents' awareness of potential conflicts of interest when interacting with the pharmaceutical industry. Secondary aims included educating residents about policy and providing a general framework for how to mitigate industry gifts and

interactions. The workshop consisted of five components:

- An evidence-based review of the literature describing interactions between physicians and industry.
- A review of guidelines, including the "No Free Lunch" Campaign, the American College of Physicians Code of Ethics, the AMA Gifts to Physicians Initiative, and the Pharmaceutical Research and Manufacturers of America (PhrMA) marketing code.
- The presentation of three digital videos written and produced at UC that depicted scenarios of routine resident contact with pharmaceutical industry marketing practices: "Free Dinner?," "A Few Gifts," and "Journal Club."³⁰ The workshop participants were subsequently divided into small groups of approximately eight to ten individuals each with a trained discussion leader (chief resident, fellow, or senior resident). The discussion was based upon each video scenario and structured around the topic of whether professional obligations and guidelines were either supported, uncertain, or potentially compromised (see Appendix). For example, under "Professional Guidelines" existed a subheading "Primary Benefit to Patients." Participants were asked whether they thought that the actions of the residents in the video scenario supported or potentially compromised this guideline, or were in uncertain relation to it. This structure allowed for a robust discussion within each small group and subsequently between small groups.
- A brief overview of the UC Hospital and residency program policy and any final participant comments or discussion.
- A handout that was distributed at the end of the workshop that included the guidelines discussed, links on how to obtain further information, an evidence-based critical analysis of a printed advertisement describing a COX-2 inhibitor, and a full bibliography.

We piloted components of the workshop prior to its implementation at a "Teaching Skills for the Medical Educator" workshop at UC in 2002.

Data analysis

We performed two sets of analyses. For both sets of analyses, statistical significance was assigned at $p \leq .05$. All analyses were performed using Stata statistical software, Version 8 (Stata Corp., College Station, TX).

First, we analyzed residents' potential changes in attitudes during training of the appropriateness of 17 specific types of industry interactions and gifts. The independent variable was year of training. We used analysis of variance (ANOVA) models to examine the relationship between training year and the perceived appropriateness of each of the 17 specific interactions or gifts. In addition, we used linear regression models that controlled for the effect of the intervention to examine the independent association of training year to each of the 17 measures of perceived appropriateness.

The second set of analyses addressed the effect of the educational workshop. We used ANOVA models to determine the effect of the intervention on the perceived appropriateness of interactions or gifts.

We checked the likely adequacy of the sample sizes for the two sets of analyses. We determined that with a standard deviation of 0.8, we would need 38 responses per group to detect a moderate difference of 0.6 in the mean rating of appropriateness³¹ and 85 per group to detect a difference of 0.4 with 90% power and a two-sided alpha of .05. Residents completing questionnaires across the years provide an adequate number for the first set of analyses examining differences between training year. The second set of analyses examining the effect of the intervention was limited to two cohorts of residents, with the number of individuals per group likely to be 30 or fewer. Therefore, only substantial changes between the intervention and control groups could be detected by this analysis.

Results

Attitude change by training year

Our first set of analyses concerned the change in residents' attitudes as they gain experience in training. During the three-year study period, 118 residents completed one or more questionnaires. A total of 236 questionnaires were completed out of a potential of 294

participants, for an overall response rate of 80%. There were no differences in response rates when measured by graduation year or questionnaire year. Table 1 presents the characteristics of the residents at the time they responded.

Do residents' views of the appropriateness of industry interactions differ by year in training? In Table 2, views of appropriateness are categorized by the individuals' year in training at the time a questionnaire was completed. Two activities showed a statistical difference across years: "lunch sponsored at noon conference" (post graduate year [PGY] 1 mean = 3.2, PGY 3 mean = 3.5, $p = .007$) and "pharmaceutical representative brief talk at noon conference" (PGY 1 mean = 2.5, PGY 3 mean = 3.0, $p = .014$).

Are the views of residents generally in accord with UC institutional policy on what is appropriate and what is not? Table 2 groups interactions and gifts by whether they are appropriate or not under institutional policy. Residents' responses on the scale of 1 to 4 have a midpoint of 2.5. For PGY 3 residents, the mean values agree with institutional policy on the appropriateness (mean < 2.5) and the inappropriateness (mean > 2.5) of 12 of 17 items (71%). While institutional policy categorizes as

inappropriate "sponsorship of informal breakfast," "sponsorship of dinner on-call," "dinner or drinks," and "organized class outing," PGY 3 residents viewed these activities as appropriate (23% of items). While institutional policy views as appropriate "product information or gifts in mailboxes," PGY 3 residents were uncertain (mean = 2.5, 6% of items).

The educational workshop may have influenced the attitudes reported in Table 2. As a check, we performed linear regression models controlling for the effect of the intervention. The type of interaction or gift was the dependent variable and year of training was the main predictor. Having participated in the intervention was included as a covariate to statistically control for the potential effect on the dependent variables. Statistically significant findings are presented in Table 3. In this table, the regression coefficients show the amount of change on a measure for PGY 2 and PGY 3 residents compared to PGY 1 residents. For example, the first result shows that regarding the appropriateness of "lunch sponsored at noon conference," PGY 2 residents averaged 0.27 higher (on the scale ranging from 1 = very inappropriate to 4 = very appropriate) compared to PGY 1 residents, adjusted for intervention group. In these models, the two previously significant findings

remained. In addition, "pens, notepads, pocket antibiotic guides," a gift deemed appropriate by the program, was likely to be perceived as more appropriate by PGY 3 residents than by PGY 1 residents. Three additional "inappropriate" gift items were perceived to be decreasingly appropriate from PGY 1 to PGY 3: "tickets to sporting events," "round of golf," and "travel/registration for national conference."

Educational workshop results

Our second set of analyses examined the effect of the educational workshop. Did the perceptions of gifts and interactions differ over a three-year training period depending upon residents' participation in an educational workshop? Over the three-year study period, the control cohort (graduation year 2004) completed 78 questionnaires (80% response rate) and the intervention cohort (graduation year 2005) completed 83 questionnaires (91% response rate). To examine the effect of the intervention we selected the six types of interactions and gifts that had demonstrated a statistically significant change for all residents from the linear regression models discussed above. Compared to the control cohort, the intervention cohort was more likely to rate only one of the "appropriate" interactions as less appropriate over the training period, "lunch at noon conference," $p = .042$. Several of the inappropriate gifts seemed to be perceived as more inappropriate by the intervention cohort, however, these findings did not reach statistical significance (data not shown).

Discussion

To our knowledge, this is the first longitudinal study to follow residents' perceptions toward interactions with and gifts from industry over their training period. We found that their perceptions of appropriateness for several items demonstrated small changes over the training period. All of the small changes in resident perceptions (Table 3) were consistent with existing residency program policy during their training period. An educational workshop designed to provide incoming residents with a framework to approach these interactions had little impact on their perceptions.

Table 1

Characteristics of 118 Internal Medicine Residents, University of Chicago Internal Medicine Residency Program, Chicago, Illinois, 2001–2004*

Characteristic	No. (%)
Intern	
Categorical	177 (75.0)
Preliminary†	44 (18.6)
Medicine–pediatrics	15 (6.4)
Post-graduate year (PGY)	
PGY 1	84 (35.6)
PGY 2	75 (31.8)
PGY 3	69 (29.2)
PGY 4	4 (1.7)
Medical schools represented	34
Contact with pharmaceutical representatives during medical school	
Residents	196 (83.1)
Medical students	137 (58.1)
Female	123 (52.1)
Non-white	104 (44.1)

* 118 residents completed 236 questionnaires over a four-year period.

† Includes anesthesiology, dermatology, emergency medicine, pathology, and radiology specialties.

Table 2

Residents' Perceptions of the Appropriateness of Pharmaceutical Industry Gifts and Interactions by Post-Graduate Year (PGY) of Training, University of Chicago Internal Medicine Residency Program, Chicago, Illinois, 2001–2004*

Measure	Mean (SD) perceived appropriateness rating [†]			F-value (df) p value [‡]
	PGY 1	PGY 2	PGY 3	
"Appropriate" interactions				
Lunch sponsored at noon conference	3.2 (0.8)	3.4 (0.7)	3.5 (0.6)	5.07 (2,231) 0.0070
Pharmaceutical representative display outside noon conference	2.9 (0.9)	3.0 (0.8)	3.0 (0.7)	1.09 (2,231) 0.34
Pharmaceutical representative brief talk at noon conference	2.5 (1.0)	2.8 (0.9)	3.0 (0.8)	4.34 (2,231) 0.014
Product information or gifts in mailboxes	2.5 (1.0)	2.4 (1.0)	2.5 (0.9)	0.08 (2,228) 0.93
Product information or gifts in workrooms	2.6 (0.9)	2.7 (0.9)	2.8 (0.8)	0.77 (2,229) 0.46
Flyers on walls in workrooms	3.0 (0.9)	3.1 (0.9)	3.1 (0.7)	0.95 (2,231) 0.39
"Inappropriate" interactions				
Sponsorship of informal breakfast	3.0 (0.8)	3.0 (0.8)	3.1 (0.9)	0.13 (2,229) 0.88
Sponsorship of dinner on-call	2.8 (1.0)	2.8 (1.0)	2.8 (0.9)	0.02 (2,228) 0.98
Paging residents to discuss products	1.3 (0.7)	1.3 (0.7)	1.5 (0.8)	1.70 (2,230) 0.19
"Appropriate" gifts				
Pens, notepads, pocket antibiotic guides	3.3 (0.8)	3.4 (0.7)	3.5 (0.5)	1.90 (2,226) 0.15
Textbooks	3.1 (0.9)	3.1 (0.8)	3.3 (0.8)	1.15 (2,227) 0.32
"Inappropriate" gifts				
Organized class outing	2.6 (1.0)	2.6 (0.9)	2.5 (0.9)	0.19 (2,226) 0.83
Private lunch	2.2 (1.0)	2.1 (0.9)	2.4 (0.9)	0.92 (2,225) 0.40
Dinner or drinks	2.5 (1.0)	2.5 (0.9)	2.6 (0.8)	0.16 (2,229) 0.85
Tickets to sporting events	2.1 (1.0)	2.0 (1.0)	1.7 (0.9)	2.61 (2,227) 0.076
Round of golf	1.9 (1.0)	1.8 (1.0)	1.5 (0.8)	2.83 (2,228) 0.061
Travel/registration for national conference	2.6 (1.0)	2.4 (1.0)	2.2 (1.0)	2.23 (2,224) 0.11

* 118 residents completed 236 questionnaires over a four-year period.

[†] Mean response on a 4-point scale ranging from 1 = "very inappropriate" to 4 = "very appropriate"; PGY = post-graduate year.

[‡] Analysis of variance (ANOVA)

The results highlight the importance of considering the effect of existing program policy and practice on any attempt to change residents' perception toward industry during their training. For example, there may be a natural tendency for residents' perceptions to alter to reflect the status quo or the current institutional practice, both of which are generally guided by any existing policy toward industry interactions.

Furthermore, because of the small degree of change that occurred over the training period, program policy may also need to be directed toward medical students: 86% of our respondents reported contact with pharmaceutical representatives during medical school (data not shown), which is consistent with prior findings.^{32,33}

Our other major finding is that the effect of a formal educational workshop on

residents' perceptions of industry gifts and interactions was minimal. The finding that residents who participated in the workshop were more likely to rate "lunch at a noon conference" as less appropriate than those who did not have the workshop is interesting given that one of the workshop video scenarios was lunch at a noon conference. However, the workshop appeared to have no effect on the evolving perceptions of the other gifts

Table 3

Residents Perceptions of the Appropriateness of Pharmaceutical Industry Gifts and Interactions by Post-Graduate Year of Training, University of Chicago Internal Medicine Residency Program, Chicago, Illinois, 2001–2004*

Measure	PGY 2 [†]	PGY 3 [†]
"Appropriate" interactions		
Lunch sponsored at noon conference	0.27 [‡] 0.015 (0.054, 0.49)	0.37 [‡] 0.004 (0.12, 0.62)
Pharmaceutical representative brief talk at noon conference	0.23 0.11 (-0.050, 0.51)	0.46 [‡] 0.006 (0.14, 0.78)
"Appropriate" gifts		
Pens, notepads, pocket antibiotic guides	0.09 40.41 (-0.13, 0.32)	0.26 [‡] 0.045 (0.0054, 0.52)
"Inappropriate" gifts		
Tickets to sporting events	-0.065 0.66 (-0.35, 0.22)	-0.37 [‡] 0.032 (-0.71, -0.033)
Round of golf	-0.12 0.40 (-0.41, 0.16)	-0.38 [‡] 0.027 (-0.72, -0.043)
Travel/registration for national conference	-0.13 0.41 (-0.44, 0.18)	-0.37 [‡] 0.048 (-0.73, -0.003)

* 118 residents completed 236 questionnaires over a four-year period.

[†] Regression coefficient (PGY 1 is reference group), *p* value, 95% CI.

[‡] *p* ≤ 0.05 from linear regression models adjusted for intervention.

or interactions represented in the digital videos, including pens, antibiotic guides, trips to national conferences, a day of golf, and dinner and drinks. One possible reason for this is that the change in residents' perceptions regarding these items are heavily influenced by other elements of their training experience, namely, faculty, resident role models, and their own behavior. For example, residents who work with a teaching attending who is a frequent invited speaker at pharmaceutical dinner events may view this as appropriate. Likewise, senior residents may influence the perceptions of those junior colleagues with whom they frequently interact. It is possible that residents in the intervention cohort, who were one year junior to residents in the control group, were influenced by the existing perceptions and practices of their senior colleagues. Lastly, a resident's own behavior may have powerful influence on his or her perceptions, regardless of any education received. For instance, residents who had participated in an industry-sponsored round of golf would be faced with a discrepancy between their perceptions

and behaviors if they rated this gift as "inappropriate."

This study has several limitations. One is that we measured residents' perceptions toward interactions with industry, which may not reflect their actual behavior. Our meetings with residents and program leaders prior to the study did indicate that the items measured were occurring within the residency program. A second limitation is making the questionnaire responses anonymous. While this encouraged candid responses, it excluded the possibility of following changes in specific individuals over time and detecting more modest changes using techniques such as repeated measures analyses. We did, however, ask if respondents had answered the questionnaire before. Subsequent analyses excluding the relatively small percentage of first-time respondents (11%) did not change our findings (data not shown). Additionally, we could not predict or control for secular trends during the study period, such as the PhRMA Code of Interactions with Health care Professionals, which was introduced

in 2002. Our comparison of control to intervention group at the PGY 2 and PGY 3 levels may have been biased by the implementation of the residency program policy, which would weaken our ability to detect an independent effect of the educational intervention. Another limitation is that the data are from one institution. Generalizability of the findings must be checked through studies elsewhere; however, most medical trainees have some contact with industry representatives during their training.⁷

Despite these limitations, residents' perceptions of gifts from and interactions with the pharmaceutical industry seem to reflect residency UC program policy while changing little over their training period. This change is likely to be directionally consistent with program policies governing residents' practice and is unlikely to be influenced by a single educational workshop during their training. Instead, perceptions of industry are likely formed early in medical training, during medical school, and heavily shaped by the hidden curriculum, or the community of residents, faculty, and institutional culture, that residents encounter throughout their medical training. Although an educational workshop may facilitate participatory discussion on resident–industry interactions, educate residents on the effect that industry can have on physicians' behavior, and enable program leadership to inform or clarify existing institutional or program policies regarding this issue, a single educational intervention or workshop during their training is unlikely to change residents' perceptions toward industry interactions. These findings are important in the context of current policies regarding residency education regarding this issue. For example, although the ACGME recommends formal instruction in interacting with the pharmaceutical industry, more intensive interventions may be necessary to achieve demonstrable changes in perceptions toward industry within the context of institutional consensus on the issue. Such interventions could include early and continued education, starting in medical school, with continued reinforcement throughout one's career, as well as broader institutional educational and policy initiatives targeted at all members of the health care team, including faculty. Future efforts in medical education

should focus on developing and evaluating intensive education programs designed to train physicians about gifts from and interactions with industry. These programs must be coupled to broader institutional policy if they are to be successful over time.

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References

- Ethical guidelines for gifts to physicians from industry (<http://www.ama-assn.org/ama/pub/category/5689.html>). Accessed 22 March 2006. American Medical Association.
- Coyle SL. Physician-industry relations. Part 1: individual physicians. *Ann Intern Med.* 2002; 136:396–402.
- Standards For Commercial Support (http://www.acme.org/dir_docs/doc_upload/68b2902a-fb73-44d1-8725-80a1504e520c_uploaddocument.pdf). Accessed 22 March 2006. Accreditation Council for Continuing Medical Education.
- Principles Regarding Pharmaceuticals and Medical Devices (<http://www.amsa.org/hp/pharmpolicy.cfm>). Accessed 22 March 2006. American Medical Student Association.
- Goodman B. No Free Lunch (<http://www.nofreelunch.org/>). Accessed 22 March 2006.
- PhRMA Code on Interactions With Healthcare Professionals (<http://www.phrma.org/files/PhRMA%20Code.pdf>). Accessed 26 March 2006. Pharmaceutical Research and Manufacturers of America.
- Lichstein PR, Turner RC, O'Brien K. Impact of pharmaceutical company representatives on internal medicine residency programs: a survey of residency program directors. *Arch Intern Med.* Jun. 1992;152:1009–13.
- Boltri JM, Gordon ER, Vogel RL. Effect of antihypertensive samples on physician prescribing patterns. *Fam Med.* 2002;34:729–31.
- Wazana A. Physicians and the pharmaceutical industry: is a gift ever just a gift? *JAMA.* 2000; 283:373–80.
- Brett AS, Burr W, Moloo J. Are gifts from pharmaceutical companies ethically problematic? A survey of physicians. *Arch Intern Med.* 2003;163:2213–18.
- Dana J, Loewenstein G. A social science perspective on gifts to physicians from industry. *JAMA.* 2003;290:252–55.
- Principles to Guide the Relationship Between Graduate Medical Education and Industry (http://www.acgme.org/acWebsite/positionPapers/pp_GMEGuide.pdf). Accessed 22 March 2006. Accreditation Council for Graduate Medical Education.
- Brotzman GL, Mark DH. The effect on resident attitudes of regulatory policies regarding pharmaceutical representative activities. *J Gen Intern Med.* 1993;8:130–34.
- Keim SM, Sanders AB, Witzke DB, Dyne P, Fulginiti JW. Beliefs and practices of emergency medicine faculty and residents regarding professional interactions with the biomedical industry. *Ann Emerg Med.* 1993; 22:1576–81.
- Reeder M, Dougherty J, White LJ. Pharmaceutical representatives and emergency medicine residents: a national survey. *Ann Emerg Med.* 1993;22:1593–96.
- Steinman MA, Shlipak MG, McPhee SJ. Of principles and pens: attitudes and practices of medicine housestaff toward pharmaceutical industry promotions. *Am J Med.* 2001;110: 551–57.
- Lurie N, Rich EC, Simpson DE, et al. Pharmaceutical representatives in academic medical centers: interaction with faculty and housestaff. *J Gen Intern Med.* 1990;5:240–43.
- Orlowski JP, Wateska L. The effects of pharmaceutical firm enticements on physician prescribing patterns. There's no such thing as a free lunch. *Chest.* 1992;102: 270–73.
- Hafferty FW. Beyond curriculum reform: confronting medicine's hidden curriculum. *Acad Med.* 1998;73:403–7.
- Ferguson RP, Rhim E, Belzair W, Egede L, Carter K, Lansdale T. Encounters with pharmaceutical sales representatives among practicing internists. *Am J Med.* 1999;107: 149–52.
- McCormick BB, Tomlinson G, Brill-Edwards P, Detsky AS. Effect of restricting contact between pharmaceutical company representatives and internal medicine residents on posttraining attitudes and behavior. *JAMA.* 2001;286:1994–99.
- Watkins RS, Kimberly J Jr. What residents don't know about physician-pharmaceutical industry interactions. *Acad Med.* 2004;79: 432–37.
- Razack S, Arbour L, Hutcheon R. Proposed model for interaction between residents and residency training programs, and pharmaceutical industry. *Ann R Coll Physicians Surg Can.* 1999;32:93–96.
- Agrawal S, Saluja I, Kaczorowski J. A prospective before-and-after trial of an educational intervention about pharmaceutical marketing. *Acad Med.* 2004; 79:1046–50.
- Hopper JA, Speece MW, Musial JL. Effects of an educational intervention on residents' knowledge and attitudes toward interactions with pharmaceutical representatives. *J Gen Intern Med.* 1997;12:639–42.
- Kelcher S, Brownoff R, Meadows LM. Structured approach to pharmaceutical representatives: family medicine residency program. *Can Fam Physician.* 1998;44:1053–56, 1059–60.
- Shaughnessy AF, Slawson DC, Bennett JH. Teaching information mastery: evaluating information provided by pharmaceutical representatives. *Fam Med.* 1995;27:581–85.
- Ethical Opinions and Guidelines. Vol 2005; 2001 (<http://www.ama-assn.org/ama/pub/category/4001.html>). Accessed 22 March 2006.
- Hodges B. Interactions with the pharmaceutical industry: experiences and attitudes of psychiatry residents, interns and clerks. *CMAJ.* 1995;153:553–59.
- Residents and the Pharmaceutical Industry. Dartmouth Fall Invitational Clinical Microsystems Conference Film Festival. Hanover, New Hampshire, 2003.
- Cohen J. *Statistical Power Analysis for the Behavioral Sciences.* 2nd ed. Hillsdale, NJ: Erlbaum, 1988.
- Bellin M, McCarthy S, Drevlow L, Pierach C. Medical students' exposure to pharmaceutical industry marketing: a survey at one U.S. medical school. *Acad Med.* 2004;79: 1041–45.
- Sierles FS, Brodkey AC, Cleary LM, et al. Medical students' exposure to and attitudes about drug company interactions: a national survey. *JAMA.* 2005;294:1034–42.

Appendix

Small-Group Structured Discussion for Residents in a Workshop on Pharmaceutical Industry Interactions, University of Chicago

The target audience for the “Residents and the Pharmaceutical Industry: A Guide to Critical Interaction” workshop has been residents from most specialties and on occasion faculty and medical educators. Workshops have traditionally included up to 20–30 participants that can be broken up into small discussion groups of no more than six participants. Following an evidence-based review of the literature, recommendations from professional organizations and a review of printed advertising, video scenarios are presented to the participants. The following handout, which has been adapted with permission from the AMA’s Gift’s to Industry Workshop, guides the discussion. Participants are asked whether they thought that the actions of the residents in the video scenario supported or potentially compromised a professional guideline/obligation, or were in uncertain relation to it. This structure allows for a robust discussion within each small group and subsequently between small groups.

Scenario 1: Arthur and Amy—Free Dinner?

As Arthur considers this invitation, are specific professional obligations/guidelines: supported, uncertain, or potentially compromised?

Obligations and guidelines	Supported	Uncertain	Potentially compromised
Professional obligations			
Competence	1	2	3
Integrity and morality	1	2	3
Altruism	1	2	3
Professional guidelines			
Primary benefit to patients	1	2	3
Not of substantial value	1	2	3
Unbiased legitimate educational activity	1	2	3
No conditions	1	2	3

Scenario 2: A Few Gifts

As the residents consider attending a national cardiology conference or playing golf, are specific professional obligations and guidelines: supported, uncertain, or potentially compromised?

Obligations and guidelines	Supported	Uncertain	Potentially compromised
Professional obligations			
Competence	1	2	3
Integrity and morality	1	2	3
Altruism	1	2	3
Professional guidelines			
Primary benefit to patients	1	2	3
Not of substantial value	1	2	3
Unbiased legitimate educational activity	1	2	3
No conditions	1	2	3

Scenario 3: Journal Club

As the residents attend a Journal Club sponsored by a pharmaceutical company, are specific professional obligations and guidelines: supported, uncertain, or potentially compromised?

Obligations and guidelines	Supported	Uncertain	Potentially compromised
Professional obligations			
Competence	1	2	3
Integrity and morality	1	2	3
Altruism	1	2	3
Professional guidelines			
Primary benefit to patients	1	2	3
Not of substantial value	1	2	3
Unbiased legitimate educational activity	1	2	3
No conditions	1	2	3