

# Medical Student Exposure to and Attitudes about Pharmaceutical Companies

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## ABSTRACT

*Purpose:* Medical students are at-risk to the influence of pharmaceutical company (Pharma) marketing. As interactions with the industry come under increasing scrutiny and regulation, previous studies on student-Pharma relations no longer may be accurate. This study assessed students' attitudes toward and interactions with Pharmas at the University of Wisconsin School of Medicine and Public Health (UWSMPH).

*Method:* A modified questionnaire based on a previously administered national survey was completed by students in April and May 2009. The survey was analyzed to disclose the frequency of student-Pharma interactions, where interactions took place, and differences between preclinical and clinical students.

*Results:* The overall response rate was 53.6% (348/649). Most student-Pharma interactions took place at locations remote from the main campus, with free lunches (70.2%), snacks (66.9%), and small, non-educational items (55.8%) representing the most common gifts. Many clinical students had discussed medical personnel-Pharma interactions with a physician or friend. Of those surveyed, 78% felt they had received limited instruction from the school on how to interact with Pharma representatives. Preclinical students expressed greater uncertainty about using Pharmas as educational resources and were more reluctant to accept Pharma gifts than clinical students.

*Discussion:* Student attitudes toward interactions with Pharmas reveal the need for further education and guidance—particularly on the risks of using Pharmas as

educational resources. Pharma exposures remote from the main campus account for a high proportion of all interactions, which further highlights the need to educate students on conflicts of interest during their pre-clinical training.

## INTRODUCTION

Interactions between pharmaceutical companies (Pharmas) and medical personnel are pervasive and often influential. In 2004, US Pharmas spent an estimated \$57.5 billion on marketing,<sup>1</sup> with \$12 billion to \$18 billion specifically targeting practicing physicians and residents.<sup>2-5</sup> This represents approximately \$8000-\$13,000 spent on each physician every year.<sup>6-7</sup> Pharmas may offer physicians a variety of services and gifts, including medication samples, meals, continued education, covered travel expenses, and sponsored research.<sup>8,9</sup> Wanza's 2000 review of the literature found physicians meet with Pharma representatives 4 times a month on average.<sup>9</sup> Almost all physicians report having some type of Pharma relationship, with free food and medication samples representing the most common exchanges.<sup>10,11</sup>

There is a substantial body of evidence to suggest that this relationship has a considerable impact on physician decision-making. Interactions with Pharma representatives increase the likelihood of physicians prescribing the sponsor's medication<sup>12,13</sup> and lead to non-rational prescribing.<sup>9,14</sup> Physicians are less likely to prescribe generic medications<sup>9,15</sup> and more likely to request that the sponsor's medication be added to hospital formularies.<sup>9,16</sup> There is a positive correlation between exposure to Pharma representatives and cost of a physician's choice of treatment.<sup>17-18</sup>

Practicing physicians, residents, and medical students acknowledge that Pharma marketing could impact their colleagues' decision-making.<sup>19-22</sup> However, in spite of evidence to the contrary,<sup>9,12-18</sup> they deny that they themselves could be influenced.<sup>19,23-28</sup> Those who believe they cannot be influenced are even more likely to accept gifts.<sup>29</sup> An unrecognized bias on the part

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of the prescriber is likely the cause of this paradox.<sup>30</sup> Rather than eliciting a conscious decision to promote medications, marketing subliminally affects physician judgment and leads to unintentional changes in prescribing practices.<sup>30</sup>

There is currently limited information on relationships between Pharmas and medical students.<sup>19</sup> Previous studies show that students feel unprepared to deal with Pharma representatives,<sup>31,32</sup> and there is minimal awareness of the policies that regulate these interactions.<sup>19</sup> Students have high exposure to Pharma marketing,<sup>19,33</sup> but there is debate over the attitudes of students toward marketing during their preclinical versus clinical years. Hymen et al<sup>31</sup> found no difference, while Fitz et al<sup>34</sup> concluded that clinical students were more receptive of Pharma gifts than their preclinical counterparts. While a national survey conducted in 2003<sup>19</sup> explored student attitudes and exposures in detail, it failed to address preclinical students altogether. Additionally, given recent attention focused on these issues, that survey may no longer reflect current trends.

The purpose of this study was to conduct a comprehensive assessment of student attitudes toward Pharmas and exposure to their influence. We compared data from students during preclinical and clinical training, determined if trends have changed since the administration of the 2003 national survey, and identified additional aspects of student-Pharma interactions.

## METHODS

### *Survey Development and Distribution*

The questionnaire was derived from a previously administered national survey.<sup>19</sup> Modifications were made after consultation with the UW Survey Research Center and based on feedback during pilot testing. Additional questions related to unique institutional concerns were added. The study was reviewed and approved as an exemption by the Minimal Risk Institutional Review Board at the University of Wisconsin.

Administration of the survey was accomplished through the Online Admission Status Information System (OASIS), an electronic account used by students for a variety of school-related issues. Results were anonymous, and completion of the survey was tracked through OASIS. Students who did not complete the questionnaire were requested to do so again via e-mail. In total, 3 reminders were sent out at approximately 2-week intervals. The survey was conducted in April and May of 2009.

One of 2 surveys was sent to students as determined by their academic level. The survey sent to third- and

fourth-year students (clinical) contained questions pertaining to clinical rotations in addition to the questions asked of first- and second-year students (preclinical). Students were queried on 5 Pharma-related issues, including exposure, the appropriateness of accepting various gifts, skepticism toward marketing and its impact, relevant curricular content, and awareness of professional associations' policies on conflicts of interest. Data were also collected on age and gender.

### *Pharma Exposure*

Students indicated their exposure to 9 different student-Pharma interactions. Clinical students were asked if they had received specific Pharma gifts, how often they were exposed to Pharma representatives during different specialty rotations, and how often they were exposed to Pharma representatives at the school's 5 major clinical rotation sites.

### *Appropriateness of Gift Acceptance*

An 11-item assessment measured student perceptions on the appropriateness of accepting various Pharma gifts. A 5-category Likert scale was used, ranging from 5=extremely appropriate, 4=very appropriate, 3=somewhat appropriate, 2=not too appropriate, and 1=not at all appropriate. For graphing purposes, responses indicating "extremely appropriate" and "very appropriate" were combined, as were those indicating "not too appropriate" and "not at all appropriate."

### *Skepticism Toward Pharma Marketing and Its Impact*

Skepticism toward Pharma marketing was measured using an 8-item assessment. Once again, a 5-category Likert scale was used, ranging from 5=extremely to 1=not at all. A category of "not sure" was included for 5 questions based on feedback during pilot testing. For graphing purposes, responses indicating "extremely" and "very" were combined, as were those indicating "a little bit" and "not at all."

### *Curricular Coverage of Physician-Pharma Interactions*

Four questions assessed students' perceptions of UWSMPH's curricular offerings on physician-Pharma interactions. To address additional sources of influence, clinical students were asked if they had discussed the topic with a resident/attending physician or a fellow medical student. Students also indicated if they believed faculty members should be required to disclose financial-based Pharma conflicts of interest prior to delivering lectures for required classes. The same question was asked with regard to extra-curricular activities, such as optional lunchtime talks or student-initiated events.

**Table 1.** Interactions between Medical Students and Pharmas

Type of Gift or Event	% of Preclinical Students who Received a Gift or Participated in an Event (N=167)	% of UW Clinical Students who Received a Gift or Participated in an Event (N=181)	% of Third-year Medical Students Nationally who Received a Gift or Participated in an Event
A book donated by a Pharma	7.2 <sup>a</sup>	42.5 <sup>a</sup>	51.0
Attended a workshop sponsored by a Pharma	3.6 <sup>a</sup>	29.8 <sup>a</sup>	25.9
Participated in a marketing survey sponsored by a Pharma	2.4	5.5	3.5
Participated in research sponsored by a Pharma	2.4	4.4	2.7
Nominated for or received an award sponsored by a Pharma	0.6	6.6	0.6
Attended a conference with travel expenses paid by a Pharma	0.6	5.5	1.8
Attended a conference with the registration fee paid by a Pharma	0.6	3.9	4.5
Obtained a research fellowship or grant sponsored by a Pharma	0.6	0	0.5
Approached a Pharma representative to request funding for an event	0.6	0.6	—
Received lunch from a Pharma	—	70.2	96.8
Ate a snack provided by a Pharma	—	66.9	89.1
Received a small non-educational gift (e.g., pen, coffee mug) from a Pharma	—	55.8	94.1
Received dinner from a Pharma	—	25.4	50.6
Attended a seminar or educational event provided by a Pharma	—	13.3	—
Received a medication sample provided by a Pharma	—	12.7	41.9

Pharma=Pharmaceutical Company

<sup>a</sup>P<.001 (comparisons made only between preclinical and clinical students at University of Wisconsin School of Medicine and Public Health and only when a sufficient number of responses [ $>5$ ] allowed  $\chi^2$  values to be computed)

### Professional Association Policy Awareness

Students indicated their familiarity with the policies of the American Medical Student Association, American Medical Association, and the Wisconsin Medical Society that regulate physician-Pharma interactions. A 5-category Likert scale was again used, ranging from 1=not at all familiar to 5=extremely familiar. Students also indicated if they were members of these organizations.

### Statistical Analysis

Data from the survey were transferred to Microsoft Excel (Microsoft Corp, Redmond, Wash) and SPSS (SPSS Inc, Chicago, Ill). Responses were coded 1-5 according to the aforementioned representations. T-tests were used to compare data between preclinical and clinical students on measures of appropriateness and skepticism. Chi-square tests were used to compare exposures within specialties, at different clinical sites, and between preclinical and clinical students. Questions that had “not sure” as a possible response were analyzed using both  $\chi^2$  tests and t-tests.

## RESULTS

### Demographics

The overall response rate was 53.6% (348/649). Preclinical (167/319, 52.4%) and clinical (181/330, 54.8%) classes had similar response rates. The average age of respondents was 24.9 and 26.7 years for preclinical and clinical students, respectively. These ages were consistent with those of the student body, where the average age was 25.15 and 27.35 years for the same groups. Among respondents reporting gender, 53.5% (182/340) were female, compared to 53.8% in the student body.

### Pharma Exposure

Student interactions with Pharmas are shown in Table 1. Clinical students had greater exposure to Pharma marketing than preclinical students but considerably less exposure than third-year students from the 2003 national survey.<sup>19</sup> Among clinical students, 51.1% (90/176) reported being asked or required to attend a Pharma-provided meal by an attending physician or resident.

During specialty rotations, the percentage of students who reported interactions with Pharma representatives was 72.5% (121/167) in family medicine, 44.0% (73/166) in internal medicine, 35.9% (60/167) in obstetrics and gynecology, 24.1% (40/166) in surgery, 17.0% (28/165) in pediatrics, 15.8% (25/158) in psychiatry, 8.8% (13/147) in neurology, and 8.5% (5/59) in emergency medicine. Results of a  $\chi^2$  test revealed that students in family medicine ( $P<.001$ ) and internal medicine ( $P<.001$ ) had more Pharma interactions than students in other specialties.

Student-Pharma interactions at different clinical sites ranged from 6.9% (2/29) to 81.3% (87/107). Three locations remote from the main campus had significantly more interactions ( $P<.001$ ,  $P<.05$ , and  $P<.05$ ) than other hospitals and clinics.

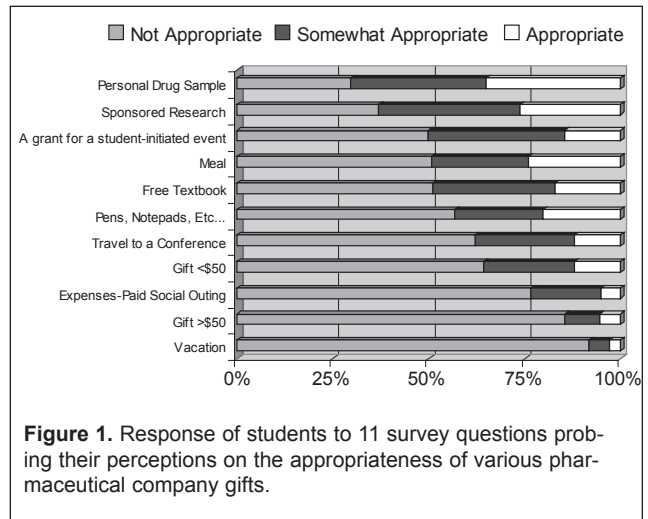
### Appropriateness of Gift Acceptance

Data on the perceived appropriateness of various Pharma gifts are presented in Figure 1. Clinical students ( $\mu=2.69$ ) felt it was more appropriate than pre-clinical students ( $\mu=2.39$ ) to accept meals from Pharmas ( $P<.05$ ). The majority of all students felt it was inappropriate to accept a vacation package, a gift greater than \$50, an expenses-paid social outing, covered travel costs to a conference, or small, non-educational gifts. Free meals, textbooks, medication samples, grants for student-initiated events, and sponsored research were viewed with greater acceptance, as <50% of respondents felt these gifts were inappropriate.

### Skepticism toward Pharma Marketing and its Impact

Data on student skepticism toward Pharma marketing and its impact are shown in Figure 2. Chi-square tests revealed significant differences between preclinical and clinical students on 3 questions related to the use of Pharmas as educational resources (Figure 2). Preclinical students responded "not sure" to these questions more frequently (ranging from 43.4% to 65.4%) than clinical students (ranging from 11.9% to 22.0%). When responses indicating "not sure" were excluded from analysis, neither t-tests nor  $\chi^2$  tests revealed significant differences between these groups.

Students from all classes believed Pharmas had little effect on medical students, that gifts would not increase their chances of prescribing a sponsor's medications, and that the school should exclude Pharma representatives from meeting with students. Results of a paired samples t-test revealed that students ( $\mu=1.65$ ) felt their classmates ( $\mu=1.90$ ) were more likely to be influenced by Pharma gifts than they were themselves ( $P<.001$ ).



**Figure 1.** Response of students to 11 survey questions probing their perceptions on the appropriateness of various pharmaceutical company gifts.

### Curricular Coverage of Physician-Pharma Interactions

Students felt the school had provided them with little information about physician-Pharma interactions. Seventy-eight percent (261/336) of respondents reported they had received limited instruction on how to interact with Pharma representatives, and 71.3% (239/335) felt they were minimally informed about relationships between physicians and Pharmas.

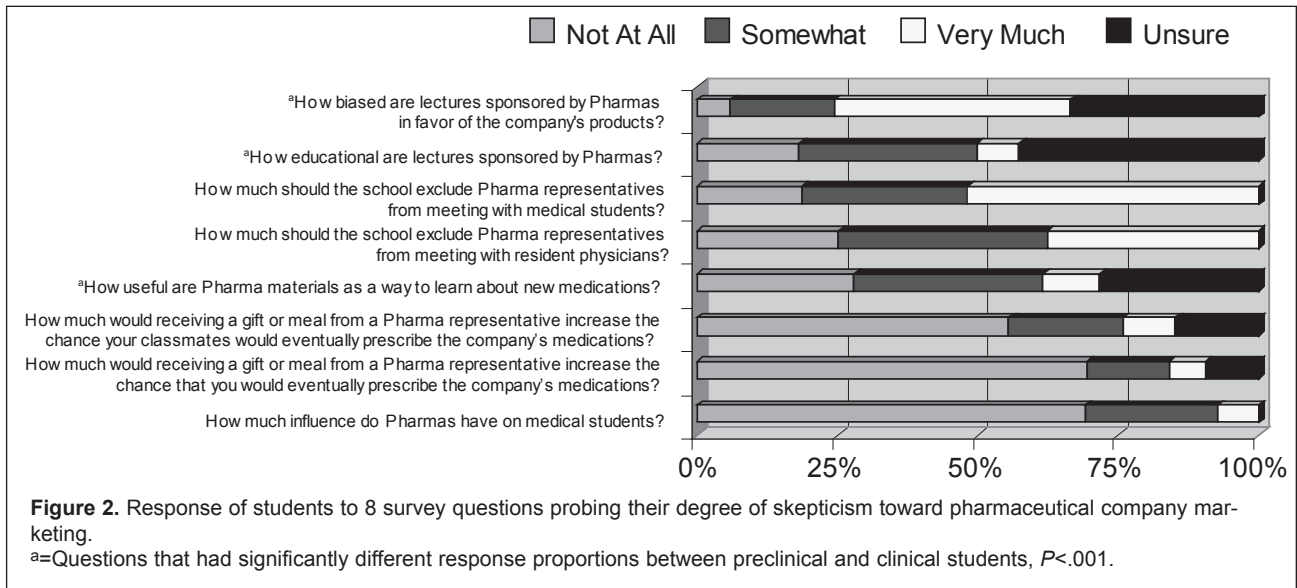
Some preclinical (60/165, 36.4%) and most clinical (118/181, 65.2%) students reported attending presentations on physician-Pharma interactions, many of which (145/170, 85.3%) took place during extracurricular activities. Among clinical students, 69.9% (121/173) had discussed the pros and cons of Pharma gifts with a resident/attending physician, and 87.5% (154/176) had discussed the same question with a fellow medical student.

Most students (280/335, 83.6%) believed that faculty should be required to disclose Pharma financial-based conflicts of interest prior to delivering required lectures. Similar results (266/332, 80.0%) were obtained when students answered the same question with regard to extracurricular activities.

### Professional Association Policy Awareness

Among respondents reporting membership to professional organizations, 28.8% (95/330) belonged to the American Medical Student Association, 37.2% (124/333) to the American Medical Association, and 51.2% (170/332) to the Wisconsin Medical Society. The percentages of students who were familiar with each organization's policy on interactions between physicians and Pharmas were 6.3% (21/336), 2.4% (8/336), and 2.7% (9/338), respectively.





## DISCUSSION

Medical students can be powerful advocates for their patients and the health care system that they will inherit. For example, the American Medical Student Association has played a major role in stimulating a new dialogue about physician-Pharma interactions via the PharmFREE Scorecard, a rigorous assessment of industry-medicine interactions and conflict-of-interest policies at academic medical centers across the United States.<sup>35</sup> This increasing concern has culminated in the Physician Payment Sunshine Act (S:301), which proposes to create a uniform national code of conduct. Thus, this study, which provides data on current medical student attitudes, policy awareness about Pharmas, and exposure to their influence, is of particular relevance.

The vast majority of clinical students at UWSMPH were involved in Pharma interactions, albeit less frequently than students sampled in the national survey.<sup>19</sup> This may be due to increased scrutiny in the popular press,<sup>36</sup> current attention nationally,<sup>37,38</sup> and established or pending policies at UWSMPH and its associated hospitals and clinics. Not surprisingly, preclinical students were involved in fewer Pharma interactions than clinical students, which is attributable to the preclinical years being devoted primarily to classrooms and labs. Also, in a finding consistent with that of previous studies,<sup>10,39</sup> the greatest number of student-Pharma interactions took place in primary care settings.

In spite of fewer interactions, students continue to be at-risk. Most respondents failed to recognize that they could be susceptible to the effects of Pharma marketing, which leaves them more vulnerable to its impact.<sup>29-30</sup> Students felt their classmates were more likely to be

influenced by gifts than they were themselves, and most respondents stated that Pharmas have little or no impact on medical students. A significant number of students displayed contradictory lines of reasoning when asked about the appropriateness of gifts, simultaneously believing it was inappropriate to accept gifts of any monetary value but permissible to accept meals and textbooks or take part in sponsored research.

Students from different classes held similar attitudes toward Pharmas with 2 exceptions. First, preclinical students felt it was less appropriate than clinical students to accept meals from Pharmas. This finding corroborates the claim of Fitz et al<sup>34</sup> who noted a similar trend toward greater acceptance of Pharma gifts during the clinical years. Second, clinical students held stronger beliefs than preclinical students regarding the validity of information provided by Pharmas. A number of students from all classes expressed uncertainty on this topic, which is noteworthy considering previous research has shown that Pharmas provide inaccurate and biased information.<sup>40</sup>

Beginning last year, a lecture dedicated to the topic of physician-industry interactions was added to the curriculum of second-year students at UWSMPH. This was clearly an appropriate addition as surveyed students felt unprepared to deal with Pharmas. Given the high number of interactions that took place remote from the main campus and the inherent difficulty in limiting these interactions, it is particularly important that preclinical students be educated on the topic. To optimize the use of the new lecture on physician-industry interactions, we recommend administering a brief exit survey to assess student reactions and guide future lecture content. In

addition to the demonstrated need for further education on the biased nature of Pharma-provided information, a small-group session would facilitate discussion and provide students with an opportunity to ask instructors specific questions.

There are some limitations to our study. Only slightly more than half of all students responded to the survey, which calls the generalizability of our results into question. However, with similar demographics between responders and non-responders, it appears there was a well-distributed sampling of students. Also, because we did not use an exact copy of the survey distributed in the national study,<sup>19</sup> comparability between the data sets is somewhat limited. This is particularly true of portions that dealt with student attitudes, as these sections underwent the largest modifications.

## CONCLUSIONS

While the number of student-Pharma interactions at UWSPH was lower than schools sampled in a prior national survey, there are still a significant number of interactions between these groups, particularly at sites remote from the main campus. Students continue to be at risk to Pharma influence, and additional guidance from the school is necessary.

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