plete conflict of interest (COI) disclosures, Reynolds amended his disclosures, adding government and private funding sources, and indicating "a misunderstanding of the requirements for reporting of conflicts of interest."^2^2

However, a check of other online published COI statements shows that Reynolds failed to disclose additional pharmaceutical conflicts from the 36-month period prior to the submission of the work, which are required disclosures according to the guidelines of the International Committee of Medical Journal Editors. In an article from January 2010, his COI stated: "Dr Reynolds receives research support . . . from GlaxoSmithKline, Forest Laboratories, Pfizer, Lilly, Bristol-Myers Squibb, and Wyeth."^3^4

In an article from 2009, Reynolds' disclosure included " . . . recipient of grant support in the form of medication supplies for investigator initiated trials from GlaxoSmithKline, Forest Pharmaceuticals, Inc. Laboratories, Pfizer Inc., US Pharmaceuticals Group, Eli Lilly and Company, and Bristol-Myers Squibb Company."^5^6

In another example, Reynolds coauthored an article in which the funding statement read that the work was "supported by a grant from and developed in theory with Cephalon Inc."^7^8 Because several of the entities Reynolds omits from his COI disclosures (eg, GlaxoSmithKline, US Pharmaceuticals Group, and Cephalon) could be perceived to benefit from the substance of the article on preventing depression, it seems appropriate for Reynolds to disclose these relationships.

Stefan P. Kruszewski, MD

Author Affiliation: Stefan P. Kruszewski M. D. & Associates, Harrisburg, Pennsylvania (kruszewski@spkmd.com).

Conflict of Interest Disclosures: The author has completed and submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest and reported having been hired as a consultant and expert witness in litigation involving OxyContin, Zyprexa, Neurontin, Zoloft and bupropion; has had 3 federal and state false claims settled as co-plaintiff with the United States: Southwood psychiatric facility; Pfizer, Lilly; receiving grants from the National Institute of Mental Health, National Institute on Aging, National Center on Minority Health and Health Disparities, National Heart, Lung, and Blood Institute, the Commonwealth of Pennsylvania, the John A. Hartford Foundation, and the American Foundation for Suicide Prevention; and serving on the American Association for Geriatric Psychiatry editorial review board. He also reported receiving in September 2012 an award to his institution from the Centers for Medicare & Medicaid Services.


Routine Conflict of Interest Disclosure by Preclinical Lecturers and Medical Students' Attitudes Toward the Pharmaceutical and Device Industries

To the Editor: Disclosure of potential conflicts of interest (COI) from relationships with the pharmaceutical and device industries is recommended in publishing, research, and education of residents, faculty,^2^ and students.^3^ Disclosure in education may foster critical evaluation of information and assessment for potential bias,^3^ but its effect is unclear.

In September 2010, Mount Sinai School of Medicine began mandating COI disclosure by lecturers to preclinical medical students. Using the natural experiment created by this new policy, we studied the association between routine COI disclosure with preclinical medical students and students' attitudes toward disclosure and industry interactions.

Methods. Policy implementation included a brief presentation to students introducing the disclosure policy, routine COI disclosure by faculty during lectures, and continuous student online access to faculty disclosures. We verified

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faculty posting of online disclosures but not disclosure during lectures.

We adapted a published survey to assess student attitudes toward COI disclosure and the appropriateness of industry gifts to physicians, industry-sponsored education, and industry-faculty relationships with responses on a 4-point Likert scale (1 = strongly disagree; 2 = disagree; 3 = agree; 4 = strongly agree). All year 1 (n = 143) and year 2 (n = 141) students were eligible to participate; results from the 2 classes were pooled.

We surveyed participants during class meetings at the beginning and end of the 2010-2011 academic year, comparing attitudes (combined agree and strongly agree responses) before and after policy implementation using a 2-sided Fisher exact test, with significance defined by P values of less than .05. The GraphPad 2005 software (Quick-Stats) was used for statistical analysis. Participation was voluntary and anonymous. The Mount Sinai institutional review board approved the study and exempted it from formal informed consent.

Results. Among 188 lecturers to preclinical students, 146 (78.9%) posted disclosures; 130 (89.0%) reported no potential COI. Survey response rates at the beginning and end of the academic year were 66.2% (188/284) and 60.9% (170/279) and were similar in first- and second-year students; 5 first-year students left school. Predisclosure and postdisclosure samples did not differ with regard to student sex (52% male), age (predisclosure: 23.7 [SD, 1.91] years, postdisclosure: 24.3 [SD, 1.96] years), or class.

Nearly all students (>97.0%) favored disclosure in both surveys (Table 1). Attitudes toward academic-industry relationships changed after policy implementation (Table 2).

### Table 1. Medical Students’ Attitudes Toward Industry Relationships and Medical Education

<table>
<thead>
<tr>
<th>Question/Statement</th>
<th>Predisclosure Exposurea</th>
<th>Postdisclosure Exposureb</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical school educators should disclose relationships they may have with</td>
<td>183/186 (98.4) [95.2-99.7]</td>
<td>163/168 (97.0) [93.0-98.9]</td>
<td>.48</td>
</tr>
<tr>
<td>pharmaceutical companies or medical device companies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical school educators that have financial relationships with pharmaceutical</td>
<td>125/181 (69.1) [62.0-75.4]</td>
<td>121/168 (72.0) [64.8-78.3]</td>
<td>.56</td>
</tr>
<tr>
<td>companies, medical device companies, or other medicine-related industries are</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>more likely to recommend these companies’ products during the learning session</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical school educators should limit their relationships with private industry</td>
<td>108/183 (59.0) [51.8-66.5]</td>
<td>91/164 (55.5) [47.8-62.9]</td>
<td>.52</td>
</tr>
<tr>
<td>The content of lectures at my school is evidence based and unbiased regardless of</td>
<td>136/178 (76.4) [69.6-82.1]</td>
<td>125/167 (74.9) [67.7-80.8]</td>
<td>.80</td>
</tr>
<tr>
<td>any relationships the lecturer may have with private industry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lecturers who disclose their potential conflict of interest are less likely to</td>
<td>136/183 (73.4) [67.5-80.1]</td>
<td>120/164 (73.2) [65.9-79.4]</td>
<td>.81</td>
</tr>
<tr>
<td>present biased material than those who do not disclose</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The quality of my education is not influenced by any relationship that an</td>
<td>106/183 (57.9) [50.7-64.8]</td>
<td>100/167 (59.9) [52.3-67.0]</td>
<td>.74</td>
</tr>
<tr>
<td>educator may have with industry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical students who agree or strongly agree, No./Total (%) [95% CI]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Predisclosure Exposurea</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Postdisclosure Exposureb</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*First- and second-year students at the start of the 2010-2011 academic year.

**First- and second-year students at the end of the 2010-2011 academic year.

### Table 2. Medical Students’ Attitudes Toward Medical School Relationships With Industry

<table>
<thead>
<tr>
<th>Question/Statement</th>
<th>Predisclosure Exposurea</th>
<th>Postdisclosure Exposureb</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is acceptable for physicians to receive gifts or lunches from pharmaceutical</td>
<td>76/185 (41.1) [34.2-48.3]</td>
<td>57/168 (33.9) [27.2-41.4]</td>
<td>.19</td>
</tr>
<tr>
<td>companies or medical device companies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Receiving gifts or food from pharmaceutical companies or medical device</td>
<td>131/188 (70.1) [63.1-76.2]</td>
<td>135/170 (79.4) [72.7-84.8]</td>
<td>.052</td>
</tr>
<tr>
<td>company representatives increases the chances physicians will prescribe the</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>company’s products</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Funds from pharmaceutical companies or medical device companies are useful for</td>
<td>110/179 (61.5) [54.2-68.3]</td>
<td>72/163 (44.2) [36.8-51.8]</td>
<td>.002</td>
</tr>
<tr>
<td>funding medical school programs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My school should prohibit pharmaceutical companies or medical device</td>
<td>104/184 (56.6) [49.3-63.5]</td>
<td>120/167 (71.9) [64.6-78.1]</td>
<td>.004</td>
</tr>
<tr>
<td>representatives from meeting with students</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My school should prohibit pharmaceutical companies or medical device</td>
<td>74/186 (39.8) [33.0-47.0]</td>
<td>95/168 (56.5) [49.0-63.8]</td>
<td>.002</td>
</tr>
<tr>
<td>representatives from meeting with medical school educators</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My school should prohibit pharmaceutical companies or medical device</td>
<td>72/186 (38.7) [32.0-45.9]</td>
<td>88/168 (52.5) [44.9-59.8]</td>
<td>.01</td>
</tr>
<tr>
<td>representatives from meeting with medical residents and house staff</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pharmaceutical company materials are a useful way to learn about new drugs</td>
<td>132/186 (71.0) [64.1-77.0]</td>
<td>106/167 (63.5) [55.9-70.4]</td>
<td>.14</td>
</tr>
<tr>
<td>Medical device company materials are a useful way to learn about new</td>
<td>139/185 (75.1) [68.4-80.8]</td>
<td>119/167 (71.3) [64.0-77.6]</td>
<td>.47</td>
</tr>
<tr>
<td>devices</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*First- and second-year students at the start of the 2010-2011 academic year.

**First- and second-year students at the end of the 2010-2011 academic year.
Agreement increased over whether schools should limit industry meetings with students (104/184 [56.5%; 95% CI, 49.3%-63.5%] predisclosure vs 120/167 [71.9%; 95% CI, 64.6%-78.1%] postdisclosure; \( P = .004 \)) and educators (74/186 [39.8%; 95% CI, 33.0%-47.0%] predisclosure vs 95/168 [56.5%; 95% CI, 49.0%-63.8%] postdisclosure; \( P = .002 \)). Agreement decreased over whether industry should fund medical school programs (110/179 [61.5%; 95% CI, 54.2%-68.3%] predisclosure vs 72/163 [44.2%; 95% CI, 36.8%-51.8%] postdisclosure; \( P = .002 \)). Attitudes did not change regarding the influence of COI on educators or educational content (Table 1). Few students believed that educational content or quality were influenced by educator relationships with industry.

**Comment.** There is little evidence documenting the effect of COI disclosure despite widespread acceptance of its importance.\(^1\) We believe our study is the first to evaluate the association between COI disclosure and preclinical medical students’ attitudes. Participants were more aware of the potential influence of industry relationships than students in past studies.\(^6\)

Independent of the policy, many favored disclosure by educators limiting industry interactions, and believed that industry interactions influence prescribing. Routine COI disclosure was associated with an increase in student desire for limitations in some industry relationships, but not with perceptions of disclosure, the effect of industry relationships on educational content, or instruction by faculty with relevant COI. The lack of association may be related to students’ relationships to professors or the rarity of faculty COI. The introduction of the policy, rather than disclosure itself, may have influenced the students’ attitudes.

There are several limitations, including the single-site, predisclosure and postdisclosure design, and potential social desirability bias. We are unaware of other changes over the year that might explain the results. We were unable to account for confounding (although there were no differences in responses by sex or class), or to verify disclosure accuracy or the presentation of disclosures during lectures.

Our findings suggest that a COI disclosure policy to students is feasible and may influence student attitudes toward industry prescribing but not education. Future studies should determine the generalizability and persistence of our findings.

Azalea Kim, MPA
Lawrence A. Mumm, BA
Deborah Korenstein, MD

**Author Affiliations:** Departments of Medical Education (Ms Kim and Mr Mumm) and Medicine (Dr Korenstein; deborah.korenstein@mssm.edu), Mount Sinai School of Medicine, New York, New York.

**Author Contributions:** Mr Mumm had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

**Study concept and design:** Kim, Korenstein.

**Acquisition of data:** Kim, Mumm.

**Analysis and interpretation of data:** Kim, Mumm, Korenstein.

**Drafting of the manuscript:** Kim, Mumm, Korenstein.

**Critical revision of the manuscript for important intellectual content:** Kim, Mumm.

**Statistical analysis:** Mumm.

**Administrative, technical, or material support:** Kim, Mumm, Korenstein.

**Study supervision:** Korenstein.

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