Prescriptive decision making is a complex process influenced by other factors in addition to scientific knowledge. Studies document that physicians’ prescribing decisions are affected by factors such as patients’ requests for medications and pharmaceutical company promotions (i.e., gifts, meals, and continuing education programs), direct-to-consumer advertising, and formulary restrictions.

Fewer investigations have addressed the influence of pharmaceutical promotions on nurse practitioner (NP) prescribing. Studies that have done so indicate that NPs have positive attitudes toward pharmaceutical marketing efforts, do not believe that interactions with representatives from industry affect their prescribing decisions, and demonstrate high prescribing rates of heavily promoted brand-name antibiotics.

These results are consistent with the literature on physicians’ prescribing practices, which document that physicians do not believe that promotional efforts affect their personal prescribing and that more contact with industry representatives increases their likelihood of (1) prescribing brand-name drugs over lower-cost generics, (2) requesting that a company’s drug be added to the hospital formulary, and (3) dispensing more drug samples. Comparable data on NP prescriptive behaviors are lacking. This dearth of data is striking considering that there are more than 150,000 NPs, significantly more than the estimated 100,000 family physicians in the United States. Nurse practitioners are authorized to prescribe in all 50 states and the District of Columbia. By 2015, there will be more than 190,000 advanced practice nurse prescribers (certified nurse midwives, psychiatric/mental health clinical nurse specialists, and NPs). Almost 97% of NPs prescribe medications, and each prescriber writes, on average, between 19 and 25 prescriptions a day, or approximately 6200 prescriptions per NP prescriber per year. In the aggregate, this translates into millions of prescriptions per year, representing a substantial portion of the medications dispensed in the United States. Consequently, these data highlight the need for a new focus on NP prescribers. The objectives of this study were to survey a nationally representative sample of NP prescribers, to assess their perceptions of pharmaceutical industry promotional activities, and to identify their beliefs about marketing influences on their prescribing behaviors.
METHODS

Study Population
The survey was conducted from November 2007 to March 2008 and was approved by the institutional review board of Spaulding Rehabilitation Hospital, Boston, Massachusetts. Participants were recruited from a national membership list of the American Academy of Nurse Practitioners, the largest professional organization of NPs in the United States, with more than 28,000 members. The American Academy of Nurse Practitioners used an automated random-number program to generate a randomized sample of 3000 members. These members received a letter by mail inviting them to participate by logging on to the study site. They were screened for eligibility, current NP licensure, state authorization to prescribe, and active NP practice. On completion of the survey, participants received a $50 gift certificate. Of 309 respondents who agreed to participate, 12 were ineligible, and 34 did not complete the survey, resulting in a final sample size of 263 NPs and a participation rate of 9%.

Survey Design
The survey was composed of 50 items comprising a Likert-type scale, yes or no questions, and scored responses. The online platform allowed a participant to determine the time frame for completing the survey.

Survey questions investigated the following 3 primary domains of interest: (1) prescribing practices and behaviors and interface with industry, (2) perceived reliability of information provided by the pharmaceutical industry, and (3) ethical acceptability of promotional gifts and meals. Study variables included promotional gifts and meals, the acceptance of industry-supplied free samples, and frequency of attendance at industry-sponsored continuing education events. Descriptive analyses were performed to address the study objectives using commercially available statistical software (SPSS version 15.0; SPSS Institute, Chicago, Illinois).

RESULTS

Sample Characteristics
The study population was predominantly female (88%) and of white race/ethnicity (94%), and 51% were 45 years or older. Most respondents (59%) had been in practice longer than 3 years; 28% were new graduates of their programs (<3 years in practice). Most (67%) practiced in the family practice specialty.

Take-Away Points
Prescriber contact and interface with pharmaceutical industry promotions have been found to contribute to non–evidence-based prescribing by physician and nurse prescribers.

- Nurse practitioner prescribers had a substantial amount of contact with pharmaceutical industry promotions in the form of representative contact, receipt of pharmaceutical samples, and industry-sponsored meal and continuing education events.
- Most nurse practitioner respondents regularly attend industry-sponsored continuing education meetings, and they reported that the information they receive at industry-sponsored continuing education events is reliable.
- These findings are of particular concern because industry sponsorship of continuing education has been found to favor products of the sponsoring company and to directly contribute to an increase in prescriptions of the highlighted drug.

Prescribing Practices and Behaviors and Interface With Industry (Domain 1)
Almost all respondents (96%) reported regular contact with pharmaceutical sales representatives (Figure 1). Eighty-three percent of respondents reported that the information they received from drug representatives was reliable, and 93% of respondents reported that free gifts distributed by sales representatives had no effect on their likelihood to prescribe a highlighted drug.

Sixty-six percent of respondents dispensed medication samples for treatment; 51% gave out samples to 1 to 5 patients a day, 12% to 6 to 10 patients a day, and 3% to more than 10 patients per day. Most (73%) stated that medication samples are somewhat or very helpful in learning about new drugs, and 62% acknowledged that samples encourage the prescription of new highly marketed medications.

Forty-nine percent of respondents reported regular attendance (1-5 times) at sponsored lunch events in the past 6 months, and 64% of respondents reported regular attendance at dinner events during the same period. Most (78%) reported that meal events were a good-to-excellent way to receive information about new drugs. Most (69%) reported that sponsored meal events encouraged the use of newer highly marketed drugs, and almost half (48%) stated that they were more likely to prescribe a highlighted drug after attending an industry-sponsored event.

Almost all respondents (96%) had attended industry-sponsored continuing education programs at regional or national conferences over the past 5 years. Ninety-one percent of respondents reported that the information received at these events was somewhat reliable or very reliable, and 83% believed that sponsored continuing education was a good-to-excellent way of maintaining affordable continuing education.

Perceived Reliability of Information Provided by the Pharmaceutical Industry (Domain 2)
Most respondents (78%) reported that attendance at in-
industry-sponsored meal events was a good-to-excellent way to obtain information about new drugs, and 61% of respondents reported that the information was somewhat reliable. Information received at meal events that also offered continuing education credits was considered at least somewhat (61%) or very (30%) reliable by most NPs.

Ethical Acceptability of Promotional Gifts and Meals (Domain 3)

Most respondents (81%) thought that it was acceptable to give out drug samples to anyone (Figure 2). Even more respondents (90%) believed that it was acceptable to attend lunch and dinner events sponsored by pharmaceutical companies, and 75% reported that it was acceptable for a speaker to be paid by a pharmaceutical company. Moreover, most respondents (61%) noted that the provision of small gifts and meals to clinical offices by pharmaceutical companies was an acceptable practice.

DISCUSSION

Like many of their physician colleagues, NPs in this study believed that, despite frequent interactions with drug company representatives, they remained objective in their prescribing practices. Most respondents thought that gifts from pharmaceutical sales representatives had no effect on their likelihood to prescribe a highlighted drug. Study findings also indicate that many respondents have regular contact with pharmaceutical sales representatives in practice settings, as well as at national meetings, sponsored meal events, and continuing education programs. Indeed, as NPs have gained prescriptive authority across the nation, they (like their physician colleagues) have become objects of pharmaceutical promotions because of their considerable potential to increase drug sales. Our findings indicate that the acceptance of gifts from industry (free meals most frequently) was common among this NP sample. The participants generally regarded sponsored meal events that coincided with lectures about drugs as a good way to receive information about new medicines on the market. This finding raises a concern because the respondents also noted that they were more likely to prescribe a highlighted drug after attending an industry-sponsored meal event. These data further support evidence from the medical and social science literature that gifting of any kind, even of small items such as pens, snacks, or meals, influences prescribing behaviors.13

Nurse practitioners indicated considerable use of drug samples for patient care, which in other investigations has been shown to influence prescribing decisions and to add burdensome costs to the healthcare system.14 Nurse practitioners noted the need to dispense samples as a way to offset the high cost of brand-name drugs, especially for their uninsured and underinsured patients. However, this stands in contrast to a recent study15 demonstrating that wealthier insured patients are more likely to receive drug samples than disadvantaged patients.

Industry sponsorship of continuing medical education is problematic because of the inherent potential of proprietary bias.16 In concert with prior research on physician prescribing, our study demonstrated that NP prescribers are inclined to attend industry-sponsored continuing education programs on a regular basis and, in so doing, are consistently exposed to potential market biases. Moreover, most respondents believed that the information they received at industry-sponsored continuing education events was reliable. These findings are of particular concern because industry sponsorship of continuing education has been found to favor products of the sponsoring company, thereby contributing to increased prescriptions of the highlighted drug at the expense of other nonpharmacologic therapies.17 Of note, industry funding for continuing medical education has increased by more than 300% between 1998 and 2007, at a cost of more than $1 billion, leading to increasing scrutiny by professional and legislative organizations.18 According to the Institute of Medicine’s Redesigning Continuing Education in the Health Professions,19 this funding mechanism raises serious questions about conflicts of interest when continuing education programs are used to influence health professionals and to increase market share.

The recent passage of the Patient Protection and Affordable Care Act (healthcare reform), which includes so-called sunshine provisions, may have a significant effect on the in-
terface of industry promotions and NP prescribing. Starting in 2013, these provisions will require pharmaceutical and medical device manufacturers to report all payments made to physician prescribers for services and gifts such as consulting fees, honoraria, entertainment, food, travel, education, and research.\(^\text{20}\) However, the provisions apply only to physicians or teaching hospitals. Therefore, industry may redirect promotional activities toward NP and other nonphysician prescribers because of the absence of reporting and other constraints for this population of prescribers.

Our analysis has some limitations. The study had a low response rate, affecting generalizability of our findings. However, online surveys have been noted to have low response rate, affecting generalizability of our findings. How-

In conclusion, NPs have heretofore been operating “under the radar” regarding research and policy on the influences of pharmaceutical marketing. Although the scope and extent of their prescribing activities have been less than obvious to consumers and to other healthcare professionals, the pharmaceutical industry has clearly taken notice. According to the pharmaceutical research company Verispan\(^\text{3}\) (now SDI, Plymouth Meeting, Pennsylvania), a 20% increase in marketing between 2004 and 2006 was directed to NPs and other nonphysician prescribers. This is striking considering the substantial number of NPs and their growing role in the delivery of primary healthcare in the United States. Therefore, it is important that all prescribers, including NPs, have access to unbiased information that is not underwritten by industry. Future research should assess influences of evidence-based academically sponsored continuing education programs on NP prescribers’ beliefs and practices.

Acknowledgments

We thank Melissa Maloney, MS, RN, and Marion Rideout, MS, RN, for their support with initial literature review and data evaluation. We also thank Dr Anthony Guarino for his input on statistical content.

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Funding Source: This study was funded by the Attorney General Consumer and Prescriber Grant Program.

Author Disclosures: The authors (ECL, DFm, SE) report no relationship or financial interest with any entity that would pose a conflict of interest with the subject matter of this article. 

Authorship Information: Concept and design (ECL, DFm); acquisition of data (ECL); analysis and interpretation of data (ECL, DFm, SE); drafting of the manuscript (ECL, DFm, SE); critical revision of the manuscript for important intellectual content (ECL, DFm, SE); statistical analysis (DFm, SE); obtaining funding (ECL); administrative, technical, or logistic support (ECL); and supervision (ECL).

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REFERENCES


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Figure 2. Ethical Acceptability of Promotional Gifts and Meals (Domain 3) Among 263 Respondents

CE indicates continuing education; NPs, nurse practitioners; PRs, pharmaceutical sales representatives.


