Recognizing Misleading Pharmaceutical Marketing Online

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In light of decision-making psychology, this article details how drug marketing operates across established and novel web domains and identifies some common misleading trends and influences on prescribing and patient-initiated medication requests. The Internet has allowed pharmaceutical marketing to become more salient than ever before. Although the Internet's growth has improved the dissemination of pharmaceutical information, it has also led to the increased influence of misleading pharmaceutical marketing. Such mismarketing is of concern, especially in psychiatry, since psychotropics generate considerable revenue for drug companies. In a climate of resource-limited drug regulation and time-strapped physicians, we recommend improving both independent monitoring and consumer awareness of Internet-enabled, potentially misleading, pharmaceutical marketing influences.

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Although the Internet has existed for a few decades, its widespread use is a relatively recent phenomenon. Internet use in general, and specifically with regard to health information, has increased enormously over a short period.[1] By 2003, nearly two-thirds of American adults had gone online, and nearly two-thirds of these adults had searched for health information at least once in the previous year.[2] The growth of online information services and patient forums can be seen as an encouraging development. These resources facilitate an unprecedented support network for millions of patients and provide invaluable health information to otherwise isolated communities. Physicians also find them useful.[3] At the same time, concerns continue to surround the many new ways in which the Internet has increasingly permitted pharmaceutical companies to bypass traditional safeguards in the doctor-patient relationship by marketing products directly to consumers.[4] Consumers include patients as well as their prescribing physicians, since, to be sold, a prescription must be deemed necessary by a doctor and desired by a patient. Pharmaceutical companies therefore seek to influence both physicians and patients through provider-directed and direct-to-consumer marketing, respectively. The majority of these marketing efforts are provider-directed, although both marketing types effectively sell medications.[5]

Although direct-to-consumer marketing is not restricted to the Internet, as a medium the Internet introduces its own host of intricacies, since it operates within a different time frame and architecture than other communications media. Unlike other means of transmission, the Internet allows for instant contact regardless of geographical distance, location, or accuracy of the information conveyed. Furthermore, its structure is not specified by any particular design, but is the self-organized product of a combination of technological capabilities and human needs. Its fluid and ever-evolving nature allows for the invention of new and often unpredictable domains and applications, many of which have been effectively used by the pharmaceutical industry,

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such as tracking a user's browsing history to tailor banner advertisements specifically to that user.[6] The global nature of the Internet also defies restrictions on direct-to-consumer marketing imposed by all countries except the United States and New Zealand.[7] As a result, nearly any user worldwide can encounter unregulated and unmonitored pharmaceutical marketing online. Clearly, such efforts are not simply repurposed print or broadcast media campaigns.

Misleading Pharmaceutical Marketing

When should influencing health care consumers (an integral objective of pharmaceutical marketing) be characterized as misleading? Although pharmaceutical marketing is sometimes construed as conventional,[8] the exceptionality of drug promotion lies in its unique consequences for both patient health and the health care system generally as well as in the nature of the patient-physician contract it can undermine. Even conventional marketing techniques are highly problematic within a medical context, since they may have detrimental downstream effects on a patient's health and trust in medical care. Inaccuracies, imbalances, failures to meet accepted scientific standards, and other misleading aspects of drug marketing can lead to increased health care costs (when patients are persuaded to buy new drugs instead of cheaper alternatives, including nonpharmaceutical treatments), injury or death (when patients are encouraged to buy drugs for which there are safer alternatives or for purposes not fully approved),[9] and eroded patient trust in the reliability of health care (when patients believe that physicians with conflicts of interest are explicitly or implicitly placing their own financial interests above the best standard of care for their patients).[8] Since patients have the right to the most objective scientific treatments, and since physicians take a professional oath to meet this standard of care, marketing that jeopardizes the objectivity (or even perceived objectivity) of this care constitutes mismarketing.

Finally, much work in psychology, social science, and medical ethics (for reviews, see Refs. 8, 10) has shown that it is not only impaired patients who are influenced by misleading pharmaceutical marketing, but also the public more generally.[8,11–13]

Conflicts of Interest in Online Pharmaceutical Marketing

Given that the pharmaceutical industry is for profit, it not only has an interest in maximizing health but also a separate and often conflicting interest in expanding the number of prescriptions written for its products. Pharmaceutical companies therefore continue to search for new and creative ways to maximize revenue, with more investment in online drug marketing; spending on Internet advertising alone is projected to rise by $830 million over the next three years.[14] In principle, this behavior is regulated by the Fair Balance requirement of the U.S. Food and Drug Administration (FDA), which states that drug marketing must not be false or misleading and must include drug risks presented in a balanced manner.[15] Yet some pharmaceutical manufacturers have repeatedly admitted to failing to meet this requirement and on several occasions have pleaded guilty to illegal marketing. Instances of pharmaceutical mismarketing are cause for special concern in psychiatry, since psychotropic medications are major revenue generators for drug companies. In 2010, four psychotropics were among the top 20 of all prescribed drugs in the United States,[16] and 5 were among the top 20 in sales revenue.[17] Regardless of the financial incentives that pharmaceutical companies have to market their products, medicine's primary ethics-based interest is to ensure the maximal health and well-being of patients.[18] Whenever this aim is jeopardized, it is the first priority of the health care profession to undo the circumstances that endanger it.

Online Domains of Pharmaceutical Mismarketing

We will now discuss how some of the most common formats of online pharmaceutical marketing can be exploited to bias physicians and patients, how the design of these promotions should be improved to be less misleading, and the common presentational trends and ethics principles that emerge from this kind of marketing. Some of these cases have been addressed by the FDA, but others have not. That some patterns of mismarketing continue uninterrupted could indicate that they are so novel that the FDA has not yet fully considered or noticed them. If the agency is indeed aware of these occurrences and presentations, it may simply lack sufficient staff to regulate them.

Search Engines

Quick and easy to use, search engines are often the first portal of inquiry for clinical information. However, most users do not look beyond the first two pages of search results.[19] Whereas 81 percent of physicians use search engines to answer a clinical question, more than half end their search at the first web page viewed.[20] The importance of the first page that opens in the search result is underscored by studies showing that medical searches of this kind are rarely just exploratory; rather, two-thirds of patients[21] and three-fourths of physicians who go online are looking for a specific medication by name.[20] Some drug companies use search engine optimization techniques,[22] and their advertisements frequent the top of such inquiries, especially if the search is conducted with the medication's name.[20] Among doctors who use search engines, 92 percent click on a link at the top of the first results page.[20] Since website objectivity is not a crucial factor in most nonmedically related searches, there is typically little reason for users to doubt the importance and usefulness of search results in these instances. The pharmaceutical industry, however, has a clear incentive to profit through its sites, and so the objectivity of these sites cannot be assumed. When health is at stake, it is important that users be presented first and foremost with sources completely free of bias or potential for bias. It may be helpful to introduce fuller disclosure of website sources at the search result level, as this could inform advertisers of which links users click from the search results page.

In 2009, the FDA warned 14 major drug companies that their search engine advertisements were misleading.[23] The companies had not included sufficient information online regarding medication risks. Companies often feature these risks in small print at the bottom of a webpage, in small textboxes that sometimes require the viewer to scroll to read them, or two or more clicks away. In 2010, Google took what appears to have been a self-initiated step toward improving the credibility of medication searches when it altered the order of nonadvertisement search results displayed. Since these changes, the first official link in a medication search is the medication's National Institutes of Health (NIH) online address (URL), which provides detailed, unbiased drug information, including side effects. This improvement, though commendable, has not altered the display order for medical condition search results, some of which promote the prescription and use of specific medication brands. For example, although only four of the top 50 Google and Yahoo search results for schizophrenia in a 2008 study led overtly to drug company websites, more than half of all the sites had identifiable commercial funding.[24] A nearly identical study found similar results when PTSD was the search term.[25] The 75 percent of web-searching doctors who are looking for information on a particular medical problem[21] can unknowingly be exposed to prescription-promoting information presented by pharmaceutical companies.

Drug Company Websites

Since one-third of physicians' and many of patients' search terms are branded medication names,[20] it is important to consider the influence of drug company websites, which may mislead viewers as any other form of marketing can. A recent meta-analysis of pharmaceutical company-funded mental health web sites found that their content leaned significantly more toward biogenetic causes and medical treatments (as opposed to psychosocial causes and treatments) than that of their financially independent counterparts.[26] Drug websites' structures and layouts influence users' perceptions of website credibility.[27] Pharmaceutical companies often display prominent photographs, fonts, and graphics on their product pages. By contrast, important safety information is sometimes hidden in plain view, thereby satisfying the FDA's Fair Balance requirement while still being hardly noticeable. On several occasions the FDA has sent warning letters to companies that have failed to include drug risk information, have included this information but placed it a few mouse clicks away, or have recommended their drugs for unapproved uses.[28] Even if companies adequately communicate drug risks through words, they may still convey biased messages via photos, videos, and other graphics, all of which may be more attention grabbing (e.g., because of their placement and dynamic character). Although such Internet practices are commonplace in conventional marketing, they may quickly become problematic in a medical context. Visual presentations of this kind can be used to convey salient, emotionally appealing messages that illustrate and sometimes magnify drug benefits, but seldom drug side effects or alternative treatments (even when the visuals accompany drug risk and treatment information). For instance, a user whose

attention is drawn to moving images of smiling, energetic beneficiaries of a medication's therapeutic effects may not notice the small print detailing side effects and contraindications. Such misleading portrayals may soften the impact of drug risk information or distract online users from that information altogether.

Some pharmaceutical companies also use so-called unbranded websites to provide information about diseases that can be treated with medications that they manufacture. Often, they do so without revealing their sponsorship of these sites.[29] In 2010 the FDA warned pharmaceutical giant Novartis about its sponsorship of three distinct websites that provided information on different types of cancer. All three sites, disguised as informational, promoted Gleevec (a Novartis product) for unapproved uses and dosages while underplaying the drug's risks.[30] One site was falsely portrayed as "independently operated and not managed by" Novartis. The site repeatedly endorsed Gleevec as a treatment option, but identified no other drugs in the same class. Despite the FDA's warnings, consumers continue to want access to these promotional sites.[31] This preference may indicate a lack of public awareness regarding the influential nature of these sites, or the extent to which physicians and patients depend on such information for rapid relief from the uncertainty that may compound their distress.

One benefit of the Internet as a marketing medium, in contrast with print and other media, is that its content may always be modified and its presentation quickly and easily improved to be less misleading. Particularly under the vigilance of the FDA, there have been noticeable steps toward fair balance in company websites and links. That said, the editable nature of the Internet is a double-edged sword: in the time it takes for the FDA to correct one inaccuracy, new problems may appear elsewhere, especially whenever companies market their drugs under multiple domain names.

E-mail Lists, Blogs, and Wikis

Domains that promote discussion among typically anonymous individuals, such as e-mail lists, blogs, and wikis, relieve authors of many of the usual constraints on communication, such as disclosures of conflicts of interest and other reputational information. Even when e-mail lists require conflict-of-interest disclosures, such rules can be ignored. In the extreme, these domains can host fraudulent testimonials from avatars, who may be employed to deceive, working within what are perceived to be trusted information channels among patients and caregivers. There has been little research into the magnitude of these adverse impacts on care giving, presumably because of the confidential nature of many of these services.

Wikipedia and other user-edited consensus resources, helpful as they can be when information is disseminated responsibly, present unique challenges to informed decision-making, since anyone online (including pharmaceutical companies) can contribute to the content of these sites. Although some of these websites have policies strongly discouraging page editing by parties carrying conflicts of interest,[32] there are no measures currently in place to prevent such editing. Moreover, although Wikipedia encourages conflict-of-interest disclosures,[32] there is no way of ensuring that user-editors comply. In fact, none of the major medically related wikis (Ganfyd, AskDrWiki, Medcyclopedia, WikiDoc, and Medpedia) address conflicts of interest. Although the extent to which pharmaceutical companies have edited wiki content is unknown, it has been discovered that at least some Wikipedia entries are written by corporations, including pharmaceutical companies.[33] Employees of the pharmaceutical giant AstraZeneca and of the global health care company Abbott, for example, reportedly used company computers to delete negative information about drugs they sell, promoting a unilaterally positive view of their products.[33] Manufacturers may also promote their medications on wiki pages featuring conditions that their products treat. These promotions may even be toward conditions for which their products are not FDA approved. Such misleading practices may contribute to persistent misunderstandings concerning the appropriate use and dosage of medications, undermining the autonomy of informed decision-making.

Health Information Services

Health information services, geared mainly toward medical professionals, often promote pharmaceutical interests while appearing to be objective sources of clinical knowledge. For example, in its first e-mail to subscribers the service MDLinx calls itself "the only way to stay on top of the medical literature." The service also e-mails pharmaceutical advertisements presented as newsletter updates, but claims to avoid pharmaceutical representative influence by "putting you in command of the representative's

visit," meaning that subscribers choose which of the virtual, soliciting pharmaceutical representatives is allowed to disseminate product information to them. However, framing the interaction this way may introduce an illusion of control,[34] exploiting the human tendency to underestimate the probability of negative outcomes in situations over which one has perceived control. Consequently, otherwise cautious subscribers are more likely to believe that they have little incentive to safeguard against manipulation, and little disincentive to engage in risky interactions with representatives.

Yet regardless of patients' or physicians' beliefs, pharmaceutical representatives have an incentive to engage in selective disclosure or to oversimplify study results to maximize sales. Furthermore, direct interactions with representatives do not facilitate exposure to the full range of drugs available on the market. Rather, these interactions typically favor brand-name drugs over generics, since manufacturers of the latter have fewer resources to devote to drug service funding. Finally, subtle framing techniques surrounding so-called e-mail updates that feature pharmaceutical advertisements can divert attention from the primary problem with these presentations: they may influence physicians to select drugs that are most marketed over those that are most effective. A recent investigation exemplified information-processing and decision-making tensions of this kind: the health information service WebMD admitted to connections with Eli Lilly and other drug and device companies.[35] *The New York Times* described the website as "permeated with pseudomedicine and subtle misinformation," framing "health information commercially, using the meretricious voice of a pharmaceutical rep."[35] In short, health information services may sometimes facilitate the very kind of marketing influence that they claim is absent.

Conclusion

In this article, we have explored how misleading pharmaceutical marketing on the Internet can exist within and morph across different web domains. Specifically, we examined the domains of search engines, drug company websites, e-mail lists, blogs and wikis, and health information services. In analyzing these domains, we found techniques of mismarketing that were both largely domain specific (e.g., deleting negative drug information on medical wikis, using search engine optimization techniques, and deploying avatars) and domain general (e.g., failing to reveal financial conflicts of interest, hiding drug risks in plain view, and displaying salient visuals that conflict with drug information provided).

These observations are important because patients, physicians, and various organizations increasingly use the Internet to convey and search for health information. We argue that online mismarketing is a serious legal and ethics-related problem with specific indicators and that it occurs across many of the domains in which health information is distributed. Since each of these domains features its own host of idiosyncrasies, future research should investigate whether the best solutions should be domain specific or whether a more general solution is preferable. Most likely, the optimal solution will operate at both levels. Although some solutions to offline forms of pharmaceutical mismarketing have previously demonstrated minor success,[11] innovative strategies may be needed in order to implement similar solutions within online contexts. Furthermore, if we are to weed out both overt and covert forms of misleading marketing, then solutions should be both strict and clear to all involved.

We think our work is best viewed as a case study of how influential mismarketing within pharmaceutical drug promotions can occur across online contexts. The domains discussed here were chosen because they appear to be among the most commonly used today. However, these are by no means an exhaustive list, and some currently popular domains include social networks (e.g., Facebook), social news and entertainment websites (e.g., Reddit), image (e.g., Flickr) and video-hosting websites (e.g., YouTube), and mobile health software (e.g., Epocrates). Future research should also investigate pharmaceutical marketing within these domains to assess the extent to which such marketing could be characterized as misleading.

Although solutions to online pharmaceutical mismarketing are beyond the scope of this article, some promising methods for implementing solutions may already be available, such as independent surveillance and evaluation systems. For example, the FDA's surveillance system, the Truthful Prescription Drug Marketing and Promotion Program (aka the Bad Ad Program), relies on prescribers and the general public to identify and report pharmaceutical misinformation. However, the FDA has found that the program is costly and appears to be underutilized among doctors and the public, with only 239 reports filed in the

program's first eight months.[36] As another example, The Swedish nongovernmental website evaluation organization, Health on the Net Foundation (HON), administers a seal of approval (called the HONcode) to web sources it considers to be objective, of high quality, and transparent.[32] Nevertheless, HONcode-certified sites are checked only periodically (starting one year after they receive the approval seal) or after the foundation's monitoring services have detected a consumer complaint or technical malfunction.[37]

Although these systems are not perfect, they may be a step in the right direction. For now, the most effective solution could be simply to raise awareness, such as through more academic publications on this subject or greater incorporation of this information into continuing medical education courses and electronic health alerts.

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