

## *Internet Marketing of Neuroproducts: New Practices and Healthcare Policy Challenges*

ERIC RACINE, HZ ADRIAAN VAN DER LOOS, and JUDY ILLES

Direct-to-consumer advertising (DTCA) of healthcare products refers to a variety of marketing practices based on a combination of information and promotion strategies directed at consumers through different media such as radio and television broadcasts, newspaper and magazine ads, and, more recently, through the Internet. The principal form of marketing used by the pharmaceutical industry is the distribution of free samples to physicians<sup>1</sup> but DTCA is an increasing part of global promotional spending for prescription drugs.<sup>2</sup> Latest estimates suggest that DTCA now represents an annual \$3.2 billion enterprise for the U.S. pharmaceutical industry. Findings from the literature show that these substantial efforts are geared toward the newer pharmaceuticals for chronic conditions with huge market potentials. The lion's share is going to the 20 most prescribed pharmaceuticals.<sup>3</sup>

Psychiatric and neurological illnesses are currently one of the main targets of prescription-drug DTCA, and, generally speaking, the Internet is having a substantial impact on the practice of psychiatry and neurology.<sup>4</sup> In a study on "DTCA visits," that is, visits where the patient initiated discussion about a prescription drug advertised on broadcast media, anxiety, depression, and pain were found to be prevalent target conditions.<sup>5</sup> Moreover, it has been shown that the Internet per se is more often used by patients with self-reported stigmatized conditions (e.g., anxiety, depression, herpes, or urinary incontinence) than by patients with nonstigmatized conditions (e.g., cancer, heart problems, diabetes, and back pain) to get health information, communicate with healthcare professionals, and utilize healthcare based on Internet information.<sup>6</sup> Some psychiatric conditions such as depression often go unrecognized and, arguably, DTCA could help in the recognition of symptoms and in the promotion of well-being. However, these claims must be carefully considered given the fact that psychiatric and neurological illnesses can impair decisional capacity and leave the patient in a state of vulnerability. Hence, the traditional claims that DTCA benefits the patient by enhancing autonomy needs to be carefully assessed and must be balanced with reports suggesting that DTCA can affect clinical presentation by shaping descriptions of symptoms and understanding of treatment.<sup>7</sup>

Although DTCA has been most extensively discussed in the context of prescription drugs, the impact of DTCA promotion of healthcare products

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stretches well beyond traditional pharmaceuticals to medical devices,<sup>8</sup> nutritional supplements,<sup>9</sup> and other non-prescription-drug products based on biotechnology<sup>10</sup> and genetic testing.<sup>11</sup> We embarked on the present study to identify emerging practices in Internet DTCA of products targeting brain function specifically, and to explore how existing FDA (Food and Drug Administration) regulations interact with these practices. Given that there are regulations and policies that govern advertising of prescription drugs whereas the same is not true of neuroimaging services and natural products (independent variables), we hypothesized that we would find gaps for critical information (e.g., risk information, healthcare information, dependent variables) in neuroimaging and natural neuroproduct Web sites.

## **Methods**

### *Search Strategy*

We performed Internet searches in June 2005 to identify Web sites advertising neuropharmaceuticals, neuroimaging services, and natural neuroproducts. Our search strategies were developed to capture the most relevant Web sites as defined below, and this goal was achieved using different approaches for the three categories of products. Exclusion criteria for all searches were: Web sites featuring research activities only, sites offering a service only available for physician or clinical laboratory use, and sites not appearing in English.<sup>12</sup>

1. Neuropharmaceuticals: Using RXList.com, we identified the 15 most prescribed neuropharmaceuticals in the United States for 2004.<sup>13</sup> Using the name of the products, we then searched the Google search engine for the official Web site for each of the identified neuropharmaceutical.
2. Neuroimaging: For neuroimaging products, no list-equivalent to the Rx-List exists. We therefore searched the first 200 results yielded by the advanced search functions of Google, Yahoo, and AltaVista<sup>14</sup> for the following keywords without Boolean operators or quotation marks<sup>15</sup>: brain scan, brain imaging, neuroimaging service, and SPECT (single photon emission tomography).
3. Natural neuroproducts: For natural neuroproducts, we used a similar strategy given that no official list of most used natural neuroproducts exists. However a single round of searches with the three search engines with the keywords "brain and natural product" yielded ample hits.

### *Coding*

We developed a coding strategy that would yield an in-depth qualitative assessment of the Web sites. The strategy was adopted from previous studies of Internet DTCA of healthcare products<sup>16</sup> and a review of applicable FDA and FTC (Federal Trade Commission) regulations.<sup>17</sup> With extensive pretesting, we validated the coding scheme for the present data. All Web sites were coded by H.V.A.V.d.L. and reviewed by E.R. Disagreements were settled by achieving consensus between the two coders.

The Web sites were analyzed for

1. Basic features: company name, name of product, language(s) used, type of product (neuropharmaceutical, neuroimaging, natural neuroproduct);
2. Sections: sections specifically for patients, healthcare providers, caregivers;
3. Components: company description, resource center, subscription to news, testimonial, news archives, self-evaluation tool, video, brochure, patient journal, polling;
4. Product information such as use of product (health-related use or non-health-related use) and explanation of related diseases;
5. Product presentation: cost of service, online purchase, incentives<sup>18</sup>;
6. Risks, safety, and confidentiality information: confidentiality statement, privacy policy, statement on patient/consumer rights, risk information<sup>19</sup>;
7. Role of healthcare providers: reenforcing or minimizing<sup>20</sup>;
8. Referral: needed or not needed.

To test for statistical significance between neuropharmaceutical, neuroimaging, and natural neuroproduct Web sites for variables in categories 2–8 listed above, we first used Pearson chi-square tests to see whether there were any differences between the three groups ( $p < .05$ ). Where the difference was significant, we used Fisher's exact tests to test for pairwise differences ( $p < .05$ ) by group. Specific company names are withheld in the results and only the category of Web site is identified (e.g., neuropharmaceutical Web site, neuroimaging Web site, natural neuroproduct Web site).

## **Results**

### *Search Yield*

Our search methods yielded 15 Web sites for the most prescribed neuropharmaceuticals<sup>21</sup> (e.g., antidepressant, antianxiety agent, central nervous system stimulant, atypical antipsychotic, analgesic), 15 neuroimaging Web sites (e.g., single photon emission computed tomography, MRI, computed tomography), and 21 natural neuroproduct Web sites (e.g., cognition and memory enhancer, stress reliever, Alzheimer treatment, treatment for attention deficit/hyperactivity disorder [ADHD]). In the latter category—and with the aim of including only the most accessible Web sites—we only kept those with more than one hit. Since we found 260 relevant Web sites out of 600, inclusion of all 260 would have created a disproportionate number of Web sites per category of product considered in this study.

### *Web Site Sections and Components*

All Web sites were presented in English and 8% offered other language options, mostly Spanish. All Web sites had a section geared for patients and consumers, but 33% of neuropharmaceutical Web sites ( $n = 5/15$ ) and 40% of neuroimaging Web sites ( $n = 6/15$ ) also included a specific section for physicians. For neuropharmaceutical Web sites, this section typically included details on prescription, product information, scientific references, and physician support. For neuroimaging Web sites, this section included referral forms, patient preparation information, and the possibility of viewing patient scans online. Some neuropharmaceutical Web sites also had a section for caregivers (e.g., parent

information for children with ADHD, tips on how to deal with a friend or family member with depression, neuralgia, obsessive-compulsive disorder or anxiety; see Table 1).

Natural neuroproduct Web sites offered the least resources, and notably fewer “resource centers” (Table 1). Resource centers were comprehensive clusters of tools and information for consumers and patients. They included items such as frequently-asked-questions sections, lists of advocacy and support groups, lists of articles and books and Internet links, downloadable talks, guides to help patients in their discussions with health professionals and/or employers, education and support programs for patients, disease management kits for patients and families of patients, brochures describing products or services to patients, glossaries, tips on choosing a physician, and patients’ journals.

Fifty-seven percent ( $n = 29/51$ ) of Web sites provided viewers with the opportunity to subscribe to newsletters or news updates on their products and company (Table 1). Forty percent also had archived news pieces or newsletters available online. For neuropharmaceutical Web sites, this content contained tips on handling the health condition and disease information as well as new FDA approvals. For neuroimaging and natural neuroproduct Web sites, news articles were favorable pieces cited to support the company products and services (e.g., “Five Tests Worth Paying For” from *The Wall Street Journal* and “Letting CT Scans Out of the Bag” from the *World Net Daily*). Some of the news pieces appeared in news section of the Web sites but were actually written by company personnel. Videos in neuropharmaceutical Web sites tended to have a biochemical explanation of the action of the neuropharmaceutical for

**Table 1.** Web Site Sections and Components

	All Web sites	Product category			Statistical comparison ( $p \leq$ )		
		NP	NI	NA	NP/NI	NP/NA	NI/NA
<b>Sections</b>							
Patients	100%	100%	100%	100%	—	—	—
Physicians	21.6%	33.3%	40%	0%	.999	.008	.003
Caregivers	13.7%	46.7%	0%	0%	.006	.001	—
<b>Components</b>							
Company description	86.3%	86.7%	93.3%	81%	—	—	—
Resource center	64.7%	93.3%	80%	33.3%	.598	.001*	.008*
Subscription to news	56.9%	53.3%	46.7%	66.7%	—	—	—
Testimonials	41.2%	40%	46.7%	38.1%	—	—	—
News archives	41.2%	40%	66.7%	23.8%	.272*	.465*	.017
Self-evaluation tools	31.4%	73.3%	20%	9.5%	.009	.001	.630
Video	25.5%	20%	46.7%	14.3%	—*	—*	—*
Brochure	21.6%	46.7%	26.7%	0%	.450	.001	.023
Patient journal	11.8%	40%	0%	0%	.017	.003	—
Polling	7.8%	13.3%	13.3%	0%	—	—	—

NP: Neuropharmaceutical; NI: Neuroimaging service; NA: Natural neuroproduct.

\*Important underlying qualitative differences. See text above for details.

— No substantial variation between product categories for which to test.

topic whereas videos in neuroimaging Web sites had company profiles and disease and product explanation. Natural neuroproduct videos typically featured company-related information and related topics (e.g., on alternative and holistic medicine).

Most Web sites ( $n = 44/51$ ; 86%) featured a company description and 41% ( $n = 21/51$ ) included testimonials related to the products or the targeted disease(s) (Table 1). These testimonials varied greatly in length and style: Some were a few sentences; others were full-length patient narratives. Several favorable testimonials were written by self-identified healthcare providers, attorneys, and educators. Two general characteristics of testimonials emerged in qualitative analysis: (1) untempered enthusiasm based on the claimed efficacy of the product or service and (2) criticisms of current healthcare practices and disappointing patient-provider relationships.

Examples of testimonials with positive emotional valence are the following:

P.S. as for my Mother, she is still taking X to this day and refuses to live without it (neuropharmaceutical Web site).

This is the beginning of an exciting new age for practitioners. . . . [T]he information these brain scans provide is very impressive (neuroimaging Web site).

One day, the mother of a child in my sons school, told me about a new product she had found and what it had done for her child, who also had ADHD, and her husband. The product was your X. I started taking the capsules and I started giving them to my son. Within a week, I was totally off of all Ritalin and I have never felt better in my life (natural neuroproduct Web site).

A few neuropharmaceutical Web sites included testimonials that mentioned side effects of their products:

The most annoying of the side effects was increased anxiety, which sometimes turned into paranoia, I would get quite worried about aspects of my health, I convinced myself after reading various medical and biology textbooks that I had some form of drug induced Parkinsons, pre-symptomal tuberculosis, joint problems (neuropharmaceutical Web site).

Criticisms of current healthcare were also frequent in testimonials and represent the other main qualitative feature found in testimonials:

I have been through a multitude of unsuccessful treatments for my mental illness since the fall of 1996. . . . My visit to the X imaging clinic was an invaluable milestone in my life. With the SPECT scan images, my clinician and I were finally able to properly diagnose my condition. In addition to a proper diagnosis, the SPECT imaging also provided essential information that was used to make treatment recommendations (neuroimaging Web site).

So finally I went to the doctor and she said that I was having trouble with my nerves—too much stress—just calm down. . . . I knew some-

thing else was going on. But that was the part that was frustrating— you can't get anybody to believe you (neuropharmaceutical Web site).

Neuropharmaceutical Web sites tended overall to provide more evaluation tools and patient journals than neuroimaging and natural neuroproduct Web sites (Table 1). Patient journals found in neuropharmaceutical Web sites provided a checklist or a calendar to track evolution of symptoms and/or effects of the neuropharmaceutical. These tools included company contact information, safety reminders, and general healthcare tips. Evaluation tools included self-tests for depression, anxiety, social anxiety disorder, panic disorder, pain, attention deficit disorder (ADD) and ADHD, post-traumatic stress disorder, and insomnia. Most included an option for the patient to print the completed evaluation and bring it to his or her physician. A few Web sites had interactive evaluation tools ( $n = 4/16$ ) that allowed the viewer to obtain an assessment of his results. Typically, a positive result such as "Your answers suggest that you may have experienced panic attacks" (neuropharmaceutical Web site) or "Your answers to the self test indicate you have Generalized Anxiety Disorder" (neuropharmaceutical Web site) would insist on the need to seek physician help: "This self test does not substitute for a diagnosis by a healthcare professional. A healthcare professional is the only person who can appropriately diagnose you. We encourage you to make an appointment with a qualified healthcare professional to discuss your symptoms" (neuropharmaceutical Web site).

Brochures provided lay summaries about products (e.g., explanation of the disease, uses and efficacy of the product, side effects, managing the disease, support program, tips on how to discuss with your physician). None were found on natural neuroproduct Web sites. One neuropharmaceutical Web site had multiple ( $N = 6$ ) versions of essentially the same brochure for different target populations (e.g., guide to depression for men, for women, for older adults, for family and friends).

Four Web sites (8%) polled their viewers directly or indirectly (e.g., answering medical questions to obtain a US\$10 rebate on a next prescription; querying about the plans viewers had to consult their doctor about the product; requiring that viewers provide personal data before obtaining a free management kit for ADHD; Table 1).

### *Product Information and Presentation*

Most products and services were promoted for healthcare related to the treatment and diagnosis of neurological and psychiatric illnesses. However, healthcare uses were less frequent in natural neuroproduct Web sites (Table 2). Healthcare uses were also qualitatively different in natural neuroproduct Web sites with usually very brief statements and little explanation of the disease mechanism and the action of the product. An example of one striking natural neuroproduct Web site explanation of healthcare use is

X is an 100% all natural product that effectively addresses the diverse and debilitating symptoms of stress, anxiety, and depression. X is not a prescription antidepressant like Prozac, Paxil, Zoloft, Wellbutrin and

**Table 2.** Product Information and Presentation

	All Web sites	Product category			Statistical comparison ( $p \leq$ )		
		NP	NI	NA	NP/NI	NP/NA	NI/NA
<b>Product information</b>							
Healthcare uses	86.3%	100%	100%	66.7%	—	.027*	.027*
Non-healthcare uses	39.2%	0%	0%	95.2%	—	.001	.001
Disease explanation	76.5%	86.7%	100%	52.4%	.483	.040*	.002*
<b>Product presentation</b>							
Cost of service	58.8%	0%	60%	100%	.001	.001	.003
Online purchase	41.2%	0%	0%	100%	—	.001	.001
Incentives	41.2%	20%	40%	57.1%	—*	—*	—

NP: Neuropharmaceutical; NI: Neuroimaging service; NA: Natural neuroproduct.

\*Important underlying qualitative differences. See text above for details.

— No substantial variation between product categories for which to test.

Effexor. X is designed to treat you safely and naturally without the worries you may find with prescription medications and their unwanted side effects. X also helps you loose that stubborn excess weight around your waist caused by high levels of the cortisol stress hormone (natural neuroproduct Web site).

In stark contrast with this example, 13 neuropharmaceutical Web sites provided complete prescription information and the two other remaining neuropharmaceutical Web sites gave detailed specifications on use, safety, and side effects (Table 2). Some natural neuroproduct Web sites provided contradictory statements on healthcare uses, claiming, for example, that their product “contains the key ingredients discovered by science to help your body repair those essential neurotransmitters and help alleviate those feelings of depression, anxiety or stress.” Nonetheless, they could feature the following disclaimer:

All content of this Web site is provided for informational purposes only, and is not a substitute for professional medical advice. The products on this Web site are dietary supplements, not medication, and are not intended to diagnose, treat, cure, or prevent any disease or illness. Neither the products nor the content of this Web site have been subject to analysis or approval by the Food and Drug Administration. Should you suffer any side effects after ingesting these products, discontinue use and consult your licensed medical practitioner. These products are to be used in conjunction with, and not as a substitute for, a balanced, healthy diet and lifestyle. Please consult with your licensed medical practitioner if you have, or suspect you may have, a health problem (natural neuroproduct Web site).

Only natural neuroproduct Web sites claimed non-healthcare uses (see Table 2). The expressions used to present these uses included “short-term memory improvement,” “mental clarity,” “support and enhance brain function,” “men-

tal alertness," "mind and body performance enhancement," "preserve and protect memory function and structure," "braincare," boosting "the brain and immune functions," "help focus attention and improve concentration," "improved sense of well being." In contrast, one neuropharmaceutical website formally discouraged non-healthcare-related lifestyle uses: "Never think of or use a prescription as a 'party drug.' Don't think of it as a means to 'get high' or as a way to 'enhance' the effects of alcohol." Natural neuroproduct Web sites also provided a lesser proportion of disease explanation, and, when they did, explanations were sometimes of questionable value in comparison to neuropharmaceutical and neuroimaging Web sites (Table 2). An example is

X is a nutritional supplement that gives the brain-targeted nutrients to aid in the balancing of neurotransmitters. Problems such as mental and emotional focus, or substance abuse may be caused by an imbalance of neurotransmitters in the brain (natural neuroproduct Web site).

All natural neuroproduct Web sites offered cost information and online purchase options (Table 2). Incentives for consumption were found in all categories of Web sites, but qualitative data shows differences, mainly between neuropharmaceutical Web site incentives on the one hand (e.g., program to offer free medication through physician consultation, savings program on brand-name medicines, rebate on related products when mentioning the consulted Web site) and, on the other hand, neuroimaging Web site incentives (e.g., family discounts, group rates, prize drawing, rebates, payment plan, credit application, complementary copy of scans) and natural neuroproduct Web sites (e.g., free samples, discounts, first-time buyer rebate, free t-shirt, certificate for members, volume discounts, free journal or audiotapes).

### *Regulatory and Patient-Provider Issues*

We surveyed Web sites for regulatory and ethical issues. We found the most contrast between neuropharmaceutical and natural neuroproduct Web sites in matters of privacy policies, statements on consumer and patient rights, risk information, reinforcement of the role of healthcare providers, and need for referral (Table 3). Statements on data confidentiality and consumer rights discussed the use of information collected by the company through its Web site.

We found qualitative differences in the type of risk information provided by neuropharmaceutical and natural neuroproduct Web sites. All neuropharmaceutical Web sites had extensive information, including specific risks, severity, and frequencies supported by scientific references, whereas some natural neuroproduct Web sites provided short and vague statements such as "X has no known contraindications . . . X is completely safe and nontoxic. In fact, clinical trials have been conducted in which pregnant women . . . safely used X" (natural neuroproduct Web site). Neuroimaging Web sites represented the intermediate case in terms of the frequency for several regulation-relevant items such as risk information and need for referral as well as the qualitative aspects of risk description.

Contrary to the statements reinforcing the role of healthcare providers, we also found—often within the same Web site—statements that minimized or



**Table 3.** Regulatory and Patient-Provider Issues

	All Web sites	Product category			Statistical comparison ( $p \leq$ )		
		NP	NI	NA	NP/NI	NP/NA	NI/NA
<b>Safety, risk, and confidentiality</b>							
Confidentiality statement	72.6%	93.3%	46.7%	76.2%	.014	.367*	.090
Privacy policy	60.8%	93.3%	33.3%	57.1%	.002	.024*	.192
Patient rights	25.5%	53.3%	26.7%	4.8%	.264	.001*	.138
Risk information	74.5%	100%	80%	52.4%	.224*	.002*	.159
<b>Role of healthcare provider</b>							
Reinforcing role of provider	78.4%	100%	86.7%	57.1%	.483	.005*	.077
Minimizing role of provider	25.5%	20%	33.3%	23.8%	—	—	—
<b>Referral</b>							
No referral	15.7%	0%	53.3%	0%	.002	—	.001
Referral needed	39.2%	100%	33.3%	0%	.001*	.001*	.008*

NP: Neuropharmaceutical; NI: Neuroimaging service; NA: Natural neuroproduct.

\*Important underlying qualitative differences. See text above for details.

— No substantial variation between product categories for which to test.

criticized the role of providers. These statements were often voiced in patient testimonials. Their content revolved around difficulties in diagnosis and treatment as well as the provider’s unawareness of new products or technologies. For example, “TCAs [tricyclic antidepressants] are effective if dosed properly, but many physicians do not prescribe adequate dosages” (neuropharmaceutical Web site).

One neuroimaging Web site stated that

SPECT is being used more widely in certain traditional areas such as assessing the remote effects of traumatic brain injury and in Alzheimer’s disease. One reason it isn’t used more widely is that most referral physicians have minimal training in neuroimaging modalities. . . . And as these advancements in other areas of medicine become increasingly more sophisticated and effective, the void of such diagnostic advancements in the psychiatric practice of medicine grows larger and more noticeable (neuroimaging Web site).

Web sites promoted different attitudes about physician referral. Neuropharmaceutical Web sites insisted on the need for physician consultation, natural neuroproduct products did not make this a requirement, and neuroimaging Web sites emphasized the possibility of neuroimaging without referral (Table 3). Neuropharmaceutical Web sites insisted on the physician as the gatekeeper to diagnosis, treatment, and medical information and even provided tips on how to discuss with physicians. Neuroimaging Web sites often presented the physician as the final judge for diagnosis and interpretation of brain scans. Both neuropharmaceutical and neuroimaging Web sites positioned their products and services in the context of the patient-provider relationship. In contrast, natural neuroproduct Web sites frequently provided minimal reinforcement of provider roles in the form of “legal disclaimers” such as

Information on this site is provided for informational purposes only and is not meant to substitute or take place of the advice of your own physician or other medical professional (natural neuroproduct Web site).

## Discussion

We found abundant information on different products targeting the central nervous system on the Internet. As we predicted, advertising strategies used in Web sites promoting neuroimaging services and natural neuroproducts differ from those promoting neuropharmaceuticals in many respects. Typically, natural neuroproduct Web sites include less risk information, confidentiality statements, privacy policies, and less positive attitudes toward healthcare providers than neuropharmaceutical Web sites. Neuroimaging Web sites hold a position between neuropharmaceutical and natural neuroproduct Web sites.

It is important to note that this combined qualitative–quantitative study of Internet DTCA has a number of limitations that must be taken into account. First the sampling strategies were different for neuropharmaceutical, neuroimaging, and natural neuroproducts. This was a necessary method, but the effects of any artifacts it may have introduced are unidentified. We also recognize that the small *Ns* limit generalizations. Further, our research design did not allow us to capture some of the visual and dynamic aspects of Web sites that change over time, and our inability to access some limited portions of the Web sites restricted to patients are other factors that may have had an effect on the results. Finally, content analysis of Web sites cannot be a substitute for studies of the impact of Web site materials on viewers and on the patient–provider relationship.

### *Emerging DTCA Practices and Gaps in Current Regulation of Healthcare Products*

Current regulations for DTCA apply expressly to prescription drugs and not broadly to healthcare products such as nonprescription drugs, neuroimaging services, or natural products.<sup>22</sup> As Noah has noted<sup>23</sup> existing DTCA regulations and regulatory mechanisms have significant limitations, including a strong focus on traditional media (e.g., broadcast or print media) with lesser attention to new forms of communication such as the Internet. Our results show that the effects of this regulatory focus are profound and leave many current marketing practices for emerging nondrug healthcare products through the Internet unaddressed. As evidenced here, current gaps in the regulation of neuroimaging services and even more obviously for natural products leave the DTCA field open to questionable practices. These include, among others, health-related claims for natural neuroproducts found in conjunction with low-profile disclaimers, rudimentary risk and contraindication information coupled with enthusiastic testimonials, and incentives that may lead to overconsumption or at least a trivialized use of products. Moreover, for some natural neuroproducts, much remains scientifically and medically untested and unknown.

The observed gaps are not necessarily surprising because general FDA oversight for safety and efficacy of dietary supplements as such is limited. The Dietary Supplement Health and Education Act (DSHEA) that currently regulates vitamins, minerals, herbs, amino acids, and many other substances is

based on a “default position” that presumes the safety and efficacy of dietary supplements.<sup>24</sup> Medical devices first approved for specific indications can also be used off-label<sup>25</sup>—like pharmaceuticals—creating challenges for regulatory guidance on specific uses of medical devices such as neuroimaging modalities. Hence, observed gaps in the regulation of the DTCA of natural neuroproducts and neuroimaging only reflect the deeper holes in the basic regulation of healthcare products. By the same token, our results show the positive effects and some effectiveness of current DTCA regulation for prescription drugs. However, on a much smaller but still palpable scale, current DTCA regulations do not keep pace with new features of Internet DTCA even for prescription pharmaceuticals. As our study and at least one other shows,<sup>26</sup> Web sites can gather impressive amounts of information and make them available in different formats. For example, self-evaluation tools suggestive of diagnosis and comprehensive educational and patient support programs amplify the complexity of marketing as well as the scope of information and resources provided. These new dimensions of marketing complicate research on the impact of DTCA on patient understanding and health-related behaviors. As information technologies develop, we can foresee that the information that regulatory bodies will have to monitor will only increase, thus further challenging current DTCA policies and already fragile oversight mechanisms.

The trends we observed in Internet DTCA also raise specific concerns for patients with psychiatric and neurological illnesses. For example, the resources and tools offered online represent opportunities to self-diagnose, self-medicate, and delay appointments with qualified healthcare professionals. Given higher use of Internet for healthcare purposes in stigmatized health conditions (e.g., depression, anxiety),<sup>27</sup> this possible impact must be further investigated to prevent the alienation of these patients from mainstream healthcare. Our findings strongly support the need for tighter regulation that would ensure the safety of healthcare products while truly empowering patient autonomy and consumer choice. Given the current gaps in the current federal legislation, the recommendations of the New York State Task Force on Life and the Law in matters of oversight, safety, and efficacy evaluation, adverse event reporting and public education can serve as a model for future discussion on the regulation of natural products.<sup>28</sup>

### *Healthcare Ethics and Patient–Provider Relationships*

Past discussion of DTCA of pharmaceuticals and other healthcare products has showcased two very different opinions.<sup>29</sup> On the one hand, DTCA can be considered a source of information for patients that has the potential to increase awareness of disease and treatment. Others have argued that the information contained in DTCA is simply masqueraded promotion.<sup>30</sup> This view is grounded in the concern of the medical profession that DTCA can negatively impact the patient–physician relationship as well as in empirical studies showing increased demands for DTCAed products.<sup>31</sup> In one study, a DTCA-related increase was found in the number of people diagnosed with depression who initiated medication therapy.<sup>32</sup>

The general debate on DTCA takes a particular twist in the context of psychiatry and neurology. DTCA can impede the doctor–patient relationship,

especially in people of low socioeconomic status,<sup>33</sup> who we know are at greater risk for mental illnesses such as depression, anxiety, and psychoactive substance abuse.<sup>34</sup> Authors of a recent randomized controlled study on the effect of DTCA for antidepressants concluded that DTCA may have competing effects on quality, potentially both averting underuse and promoting overuse.<sup>35</sup> Consequently, the benefits of DTCA in terms of encouraging hard-to-reach sections of the population to seek preventive care must be balanced against increased healthcare costs caused by clinically inappropriate requests generated by DTCA.<sup>36</sup>

Some features of the Web sites we examined highlight the need for healthcare providers in psychiatry and neurology to be prepared to deal with new healthcare products and health claims. Patients get some of the most recent updates on FDA approval of new products from neuropharmaceutical Web sites; they may read news reports on new neuroimaging services and have the opportunity to listen to convincing video talks on natural cognitive enhancers. As we observed, they may even fill in an online self-evaluation for depression and anxiety and bring it, along with product samples, to their provider. Patients may come to the clinic with enthusiastic assessments of brain imaging and its power to reveal psychiatric illnesses. All these possibilities based on real features of Internet DTCA may change the clinical presentation of disease and the description of symptoms.<sup>37</sup>

The DTCA challenges faced by psychiatrists, neurologists, and allied healthcare workers are not necessarily unique. For example, a study of DTCA for breast and ovarian cancer genetic tests has shown the need for proactive preparation of healthcare providers and for concerted responses to new healthcare products.<sup>38</sup> However, current public understanding of neuroscience,<sup>39</sup> popular beliefs about mind-body relationships coupled with neuro-essentialist and neuro-realist statements<sup>40</sup> can intermingle to create a unique set of challenges for the delivery of quality healthcare services to psychiatric and neurological patients. Current DTCA practices have led the Ethics, Law, and Humanities Committee of the American Academy of Neurology to write a practice advisory on the participation of neurologists in direct-to-consumer advertising.<sup>41</sup> Our results suggest that this work can serve as a basis to address other emerging DTCA practices.

## **Conclusion**

DTCA is a growing part of global promotional expenditures in the drug industry, including pharmaceuticals focused on the function of the brain. Our study suggests that current FDA guidelines for pharmaceuticals do not translate readily to other health products, and that the regulation covering the promotion of nonprescription drug healthcare products such as neuroimaging services and natural neuroproducts have significant gaps. Some new practices enabled by Internet DTCA even challenge current regulations covering prescription drugs themselves. Factors underlying these gaps include pressures from the industry and a traditional western emphasis on consumer choice and the market economy. However, as the bioethicist Eric Cassell recently argued, we should be critical of the equation quickly drawn between consumer choice, respect for autonomy, and respect for persons. If respect for persons necessarily entails respect for autonomy and consumer choice, consumer choice is not the

only consideration for the respect for autonomy, and respect for autonomy is only one aspect of respect for persons.<sup>42</sup> A true commitment to higher ethical principles must therefore drive the research on the many complex facets of DTCA of health-related products, and particularly those targeting the brain.

## Notes

1. Ma J, Stafford RS, Cockburn IM, Finkelstein SN. A statistical analysis of the magnitude and composition of drug promotion in the United States in 1998. *Clinical Therapeutics* 2003;25:1503-17.
2. Gahart MT, Duhamel LM, Dievler A, Price R. Examining the FDA's oversight of direct-to-consumer advertising. *Health Affairs* 2003;Suppl Web Exclusives:W3-120-3.
3. See note 1, Ma et al. 2003; see note 2, Gahart et al. 2003; Hollon MF. Direct-to-consumer advertising: A haphazard approach to health promotion. *JAMA* 2005;293:2030-3.
4. Styra R. The Internet's impact on the practice of psychiatry. *Canadian Journal of Psychiatry* 2004;49:5-11; Hollon MF. Direct-to-consumer marketing of prescription drugs: A current perspective for neurologists and psychiatrists. *CNS Drugs* 2004;18:69-77.
5. Weissman JS, Blumenthal D, Silk AJ, Newman M, Zapert K, Leitman R, et al. Physicians report on patient encounters involving direct-to-consumer advertising. *Health Affairs* 2004;Suppl Web Exclusives:W4-219-33.
6. Berger M, Wagner TH, Baker LC. Internet use and stigmatized illness. *Social Science and Medicine* 2005;61:621-7.
7. See note 4, Hollon 2004; see note 5, Weissman et al. 2004.
8. Illes J, Kann D, Karetsky K, Letourneau P, Raffin TA, Schraedley-Desmond P, et al. Advertising, patient decision making, and self-referral for computed tomography and magnetic resonance imaging. *Archives of Internal Medicine* 2004;164:2415-9.
9. New York State Task Force on Life & the Law. *Dietary Supplements: Balancing Consumer Choice & Safety*. Albany, NY: Department of Health; 2005.
10. Katsnelson A. Big biotech embraces direct-to-consumer advertising. *Nature Biotechnology* 2005;23:1193.
11. Gollust SE, Hull SC, Wilfond BS. Limitations of direct-to-consumer advertising for clinical genetic testing. *JAMA* 2002;288:1762-7; McCabe LL, McCabe ERB. Direct-to-consumer genetic testing: Access and marketing. *Genetic Medicine* 2004;6:58-9; Centers for Disease Control and Prevention. Genetic testing for breast and ovarian cancer susceptibility: Evaluating direct-to-consumer marketing—Atlanta, Denver, Raleigh-Durham, and Seattle. *Morbidity and Mortality Weekly Report* 2004;53:603-6; Editorial. Unapproved tests on a chip. *Nature* 2005;438:71.
12. See note 11, Gollust et al. 2002.
13. NDCHealth. 2004. RxList, The top 300 prescriptions for 2004 by number of US prescriptions dispensed; c2005 (cited Dec 8). Available at: <http://www.rxlist.com/top200.htm>.
14. See note 11, Gollust et al. 2002; Illes J, Fan E, Koenig B, Raffin TA, Kann D, Atlas SW. Self-referred whole-body CT imaging: Current implications for health care consumers. *Radiology* 2003;228:346-51.
15. See note 14, Illes et al. 2003.
16. See note 11, Gollust et al. 2002; see note 14, Illes et al. 2003; Bell RA, Kravitz RL, Wilkes MS. Direct-to-consumer prescription drug advertising, 1989-1998. A content analysis of conditions, targets, inducements, and appeals. *The Journal of Family Practice* 2000;49:329-35; Cho MK, Arruda M, Holtzman NA. Educational material about genetic tests: Does it provide key information for patients and practitioners? *American Journal of Medical Genetics* 1997;73:314-20.
17. See note 2, Gahart et al. 2003; U.S. General Accounting Office. *Prescription Drugs: FDA Oversight of Direct-to-Consumer Advertising has Limitations (GAO-03177)*. Report to Congressional Requesters. Washington, D.C.: U.S. General Accounting Office; 2002; Food and Drug Administration. C.F.R. 21 vol. 4, Part 202. Washington, D.C.: U.S. Government Printing Office, 2001:72-81.
18. See note 11, Gollust et al. 2002; see note 14, Illes et al. 2004.
19. See note 16, Cho et al. 1997.
20. See note 17, U.S. General Accounting Office 2002.
21. Three top neuropharmaceuticals from the RxList had no identifiable Web site and were discarded in favor of the next mostly prescribed pharmaceutical with a Web site on the RxList.

22. See note 17, U.S. Food and Drug Administration 2001.
23. Noah BA. Dietary supplement regulation in flux. *American Journal of Law & Medicine* 2005;31:147-53.
24. See note 23, Noah 2005.
25. Herb A. Off-label drug use. Annual Meeting. American Society for Bioethics and the Humanities, Washington, D.C.; 2005.
26. Waack KE, Ernst ME, Graber MA. Informational content of official pharmaceutical industry web sites about treatments for erectile dysfunction. *The Annals of Pharmacotherapy* 2004;38:2029-34.
27. See note 6, Berger et al. 2005.
28. See note 9, New York State Task Force on Life & the Law 2005.
29. Wolfe SM. Direct-to-consumer advertising—education or emotion promotion. *New England Journal of Medicine* 2002;346:524-6.
30. Farrell J. The ethical implications of direct-to-consumer pharmaceutical advertising. *Philosophy & Public Policy Quarterly* 2003;23:20-3.
31. Mintzes B, Barer ML, Kravitz RL, Bassett K, Lexchin J, Kazanjian A, et al. How does direct-to-consumer advertising (DTCA) affect prescribing? A survey in primary care environments with and without legal DTCA. *Canadian Medical Association Journal* 2003;169:405-12; Gilbody S, Wilson P, Watt I. Benefits and harms of direct to consumer advertising: A systematic review. *Quality & Safety in Health Care* 2005;14:246-50; Hansen RA, Shaheen NJ, Schommer JC. Factors influencing the shift of patients from one proton pump inhibitor to another: The effect of direct-to-consumer advertising. *Clinical Therapeutics* 2005;27:1478-87; Mouchawar J, Laurion S, Ritzwoller DP, Ellis J, Kulchak-Rahm A, Hensley-Alford S. Assessing controversial direct-to-consumer advertising for hereditary breast cancer testing: Reactions from women and their physicians in a managed care organization. *American Journal of Managed Care* 2005;11:601-8.
32. Donohue JM, Berndt ER, Rosenthal M, Epstein AM, Frank RG. Effects of pharmaceutical promotion on adherence to the treatment guidelines for depression. *Medical Care* 2004;42:1176-85.
33. Murray E, Lo B, Pollack L, Donelan K, Lee K. Direct-to-consumer advertising: Public perceptions of its effects on health behaviors, health care, and the doctor-patient relationship. *The Journal of the American Board of Family Practice* 2004;17:6-18.
34. World Health Organization. *The World Health Report 2001. Mental Health: New Understanding, New Hope*. Geneva, Switzerland: World Health Organization; 2001.
35. Kravitz RL, Epstein RM, Feldman MD, Franz CE, Azari R, Wilkes MS, et al. Influence of patients' requests for direct-to-consumer advertised antidepressants: A randomized controlled trial. *JAMA* 2005;293:1995-2002.
36. See note 33, Murray et al. 2004.
37. See note 4, Hollon 2004.
38. See note 11, Centers for Disease Control and Prevention 2004.
39. Herculano-Houzel S. Do you know your brain? A survey on public neuroscience literacy at the closing of the decade of the brain. *The Neuroscientist* 2002;8:98-110.
40. Racine E, Bar-Ilan O, Illes J. fMRI in the public eye. *Nature Reviews Neuroscience* 2005;6:159-64.
41. The Ethics, Law and Humanities Committee of the American Academy of Neurology. Practice advisory: Participation of neurologists in direct-to-consumer advertising. *Neurology* 2001;59:995-6.
42. Cassell EJ. The Schiavo case: A medical perspective. *Hastings Center Report* 2005;35:22-3.