

The Effect of Orthopedic Advertising and Self-Promotion on a Naïve Population

Stephen Mohny, MD, Daniel J. Lee, MD, and John C. Elfar, MD

Abstract

There has been a marked increase in the number of physicians marketing themselves directly to patients and consumers. However, it is unclear how different promotional styles affect patients' perceptions of their physicians. We hypothesized that self-promoting orthopedic surgeons enjoy a more positive impact on nonphysician patients as compared to non-self-promoting surgeons, as well as a corresponding negative impact on their peer-surgeons.

Surgeon websites were selected from the 5 largest population centers in the United States. Subjects with varying degrees of

familiarity with orthopedic surgery evaluated Internet profiles of surgeons on a forced choice Likert scale to measure the amount of self-promotion. The naïve subjects judged self-promoting surgeons more favorably than the orthopedic surgeons. In contrast, board-certified orthopedic surgeons viewed self-promoting surgeons more negatively than did their nonphysician counterparts.

In summary, the present study revealed that the potential for self-promotion to unduly influence potential patients is real and should be a considerable concern to surgeons, patients, and the profession.

In 1975, the American Medical Association (AMA) lifted the professional ban on physician advertising after a successful Federal Trade Commission suit.¹ Since then, there has been a marked increase in the number of physicians marketing themselves directly to patients and consumers. With the pervasive nature of the Internet, never before has it been so easy and inexpensive to effectively communicate with a targeted population of people and influence their behavior. Few would dispute the role of advertising on consumer choices when used to sell products and services, change behavior, and educate consumers across all types of industries and professions. Thus, it is reasonable to hypothesize that the nature and content of a surgeon's web presence could significantly affect patients' decision-making and their impression of the orthopedic surgery profession.

There is a lack of consensus among physician organizations regarding physician advertising. For example, the American Association of Physicians and Surgeons (AAPS) takes an ethical stand on

physician self-promotion. Their position states "The physician should not solicit patients. Professional reputation is the major source of patient referrals. The physician should be circumspect and restrained in dealing with the communication media, always avoiding self-aggrandizement."² In contrast, the AMA has a less defined stance on physician self-promotion. With the exception of conflicts of interest and privacy guidelines, the AMA has few recommendations regarding the content of physician websites. The organization's position states "There are no restrictions on advertising by physicians except those that can be specifically justified to protect the public from deceptive practices. ... Nothing in this opinion is intended to discourage or to limit advertising and representations which are not false or deceptive."³ This guideline emphasizes accuracy of health-related information, but does not limit physician self-promotion or self-aggrandizement. The American Academy of Orthopaedic Surgeons (AAOS) holds a similar position. In their position statement on advertising by orthopedic

Authors' Disclosure Statement: The authors report no actual or potential conflict of interest in relation to this article.

surgeons, they encourage advertising and competition as “ethical and acceptable” as long as they are representing services in a “clear and accurate manner.”⁴ Furthermore, the AAOS also states that “An orthopaedic surgeon shall not use photographs, images, endorsements and/or statements in a false or misleading manner that communicate a degree of relief, safety, effectiveness, or benefits from orthopaedic care that are not representative of results attained by that orthopaedic surgeon.”⁴ The surgeon is responsible for his/her advertising materials and the content and claims therein, and is generally policed by peers through a complaint process with the AAOS.

Notably, up to 75% of Americans use the Internet for health-related information and this number is likely to increase.⁵ Patients who utilize the Internet must choose from a vast array of search results for medical information from credible resources. Which sources are to be believed and relied upon? This depends on the health literacy among the general population. Inadequate health literacy is defined as “limited ability to obtain, process, and understand basic health information and services needed to make appropriate health decisions and follow instructions for treatment.”⁶ Patients have different levels of health literacy often unknown to even the most well-intentioned healthcare professional. It is often difficult to provide appropriate and meaningful information at a level that is most beneficial to the patient. It is estimated that 89 million people in the US have insufficient health literacy to understand treatments or preventive care.⁷ Certainly, with this information in mind, the orthopedic surgeon must consider his/her audience, and the potential for a fiduciary responsibility when preparing Internet content.

A tangible example of marketing results is the increasing popularity of robotic surgery over the last decade.⁹ Hospitals routinely advertise the availability of robotic surgery at their institution through various means, including roadside billboards. Despite limited evidence supporting a benefit of robotic surgery beyond less expensive conventional laparoscopic surgery, patients are increasingly seeking robotic surgery.⁹ With society’s increasing infatuation with technology, this is likely based on the presumption that robotic surgery is better and safer than conventional methods. It is likely that marketing pressure is at least partly responsible for the widespread adoption of robotic-assisted surgery and words used in marketing highlighting novelty have an important influence on patient preference.⁸

Orthopedic surgery, with its large proportion of elective surgeries, offers a unique venue to study differences in patient perceptions. Preoperative evaluations in orthopedics are often performed after an assessment of a surgeon’s reputation, which offers the patient an ability to choose their surgeon within their community.

We pondered how different promotional styles would affect potential patients’ perceptions. Would people believe that a self-promoting physician was more competent? Could fellow doctors “see through” the self-promotion of their peers? Based on the premise that advertising and self-promotion are undertaken because they are effective, we hypothesized that nonphysician patients perceive self-promoting orthopedic surgeons more favorably compared to members of the medical community.

Although numerous anonymous physician review sites exist, our analysis focused on surgeon self-promotion through personal websites or web pages. Within these sources, there exists a wide array of information and methods that physicians utilize to present themselves. Some physicians merely post their educational background and qualifications. This appears most often when the physician is associated with an academic institution and their profile is part of an institution’s website. Others post extensive self-promoting statements about technical skill and innovations in clinical practice. They sometimes include information regarding charity donations, level of community involvement, and practice philosophy.

Materials and Methods

Categorization of Surgeon Websites and Ratings

Surgeon websites were selected from the 5 largest population centers in the United States. Analysis was undertaken to categorize the self-promotion content of each selected website using an objective scale to quantitatively assess the number of times that physicians referred to themselves in a positive manner. A thorough search of the literature did not reveal any validated questionnaire or assessment tool usable for this purpose. Five blinded raters were asked to count the number of positive self-directed remarks made by the author of each website. Websites were ranked based on the number of such statements. No rater was exposed to any styling or graphical information from any website. Only textual statements were used for the purposes of this study. All statements were printed on paper and evaluated without the use of a computer to prevent any searching or contamination.

tion of the subject or rater pool.

Websites were considered as *self-promoting* (using language that promotes the physician beyond the use of basic facts), or *non-self-promoting* (presenting little beyond basic biographical information) based on the presence of many (more than 5) or few (less than 5) self-promoting statements. The breakpoint of 5 self-promoting statements served to highlight a clear transition between the 2 general types of websites and provided a good demarcation between self-promoters and non-self-promoters. This distinction allowed for the choosing of contrasting websites, which could directly probe the question in our hypothesis about the effect of such websites on naïve or surgeon-peer respondents.

Each website was judged independently by 5 blinded raters. Inter-rater reliability scores were then calculated using Fleiss' Kappa to assess reliability of the categorization of self-promoter or non-self-promoter. This value was calculated to be $k = .80$, 95% confidence interval (0.58-1.01), which is suggestive of a "substantial level of agreement."⁹

Websites categorized as non-self-promoting contained a mean number of self-promoting statements of less than 2 (0-1.8) as judged by the 5 raters. By contrast, websites categorized as self-promoting had a mean number of self-promoting statements of 6.4 or higher (6.4-22.6). When the self-promoting websites and the non-self-promoting websites were compared, they were significantly different in the number of self-promoting statements $t(43) = 7.90$, $P < .001$, with self-promoting websites having significantly more self-promoting statements than non-self-promoting websites.

Surveys and Respondents

Next, a survey of 10 questions of interest was developed. A thorough literature search revealed no validated measure or survey to measure the effects of surgeon or physician self-promotion. We developed a 10-question survey to prove the impressions and allow for assessment of differences between respondent groups to measure the effect of promotion. The questions (see **Appendix** for survey questions) included a forced Likert rating system. Each response occurs and is presented on a scale from 0 to 3 (0 = Strongly Disagree, 1 = Disagree, 2 = Agree, and 3 = Strongly Agree).

Respondents were true volunteers recruited from 2 groups that were termed "surgeon-peers" and "naïve subjects." Surgeon-peers were board-certified orthopedic surgeons (N = 21, all

with medical doctorates). Demographic breakdown of the surgeon-peers revealed them to be reflective of the general population of orthopedic surgeons (71.4% male, 28.6% female, 90.2% Caucasian, 4.8% African American, and 4.8% Asian, all with professional degrees). Naïve subjects (N = 24, average age 41 years) were selected based on the criterion of having no affiliation with a health-care system and no history of interaction with an orthopedic surgery or surgery in general. The demographic breakdown of naïve subjects was 45.8% male, 54.2% female, 79.1% Caucasian, 16.7% African American, and 4.2% Asian. Half of the naïve respondents had a Bachelor's degree, 17% had a Master's degree, 4% had a professional degree, and 29% had a high school diploma. No volunteer, in either group, received any form of inducement or reward for participation so as not to skew any responses in favor of physicians.

All participants were asked to read each surgeon's statements and then complete a survey for each statement. Volunteers were not informed of a surgeon's calculated level of self-promotion, and they were presented the survey questions in random order. Survey completion required unreimbursed time of approximately 1 to 2 hours.

Statistical Methods

The data compiled was then analyzed with SAS/STAT Software (SAS Institute Inc.) and a LR Type III analysis using the GENMOD procedure. The method of analysis and presentation of data focuses on the relationship between respondents perceptions between the surgeon-peer and naïve subject groups. The P values presented are the significance of the testing of interactions comparing the difference between surgeon-peers and naïve subjects, and the differences in their responses to each question for self-promoters and non-self-promoters. Surgeon-peers answer questions differently based on their assessment of a self-promoter or non-self-promoter website. It is this difference that is compared to the analogous difference for naïve subjects and statistically evaluated. The LR statistic for type III analysis tests if the differences are significantly different, ie, if the difference between the 2 subject groups is statistically significant. All statistical methods were performed by a qualified statistician who helped guide the design of this study.

Results

Each respondent was asked if they were aware that misinformation about doctors exists on the

Internet. Half of the naïve subjects affirmed awareness of this whereas the other half were unaware. All surgeon-peers were aware of the presence of misinformation regarding physicians on the Internet.

The results of the comparisons are shown in the **Table**. The columns show the average response to each question for self-promoters and non-self-promoters grouped by either surgeon-peer or naïve subject. In judging the overall accuracy of statements made on the Internet, naïve subjects found no difference between self-promoters and non-self-promoters, whereas surgeon-peers judged the difference to be large and significant in favor of non-self-promoting surgeons. Surgeon-peers generally rated non-self-promoters with significantly more positive Likert scores, indicating improved “competence,” “excellence,” and “better quality of care” when compared to naïve respondents (Table). The direction and magnitude of the difference was also striking, with the naïve respondents favoring self-promoters on all of these questions. This held true for the choice of orthopedic surgeon, where naïve responders favored self-promoters and surgeon-peers favored

non-self-promoters. Moreover, naïve subjects believed that self-promoters would be significantly more likely to help them in the event of a complication, whereas surgeon-peers believed the opposite. Even when the direction of difference was the same in both groups, statistically significant differences in the responses were evident, as was the case when respondents were asked “Did the surgeon inflate his/her technical skills?” or “Did the author of this statement seem arrogant?” Both groups favored self-promoters for these questions, but the differences were larger among surgeon-peers, indicating that naïve subjects were somewhat less sensitive to the differences between promoters and non-self-promoters. There was no difference between surgeon-peers and naïve subjects in their expectations of sanctions against self-promoters’ licenses when compared to non-self-promoters, which was the only question to fail to garner a significant difference between respondents.

Discussion

This study explores the differences in the perceptions of physician websites between board-

Table. Survey Results for Orthopedic Surgeon Group vs Naïve Group

Question	Orthopedic Surgeon Group		Naïve Group		P Value ^a
	Self-promoter	Non-self-promoter	Self-promoter	Non-self-promoter	
The author of this statement is competent	2.00	2.13	2.23	1.94	.003
The author of this statement is an excellent surgeon	1.68	1.86	2.10	1.49	<.001
The author of this statement would provide you with quality care	1.72	1.98	2.13	1.70	<.001
You would choose this surgeon if you needed surgery	1.45	1.93	2.11	1.65	<.001
The author of this statement inflates his/her technical skills	2.11	0.88	1.38	0.98	<.001
The author of this statement is arrogant	2.14	0.85	1.29	0.87	<.001
You expect that this doctor has NO sanctions against his/her license	2.04	2.09	1.94	1.95	.8075
I believe this doctor will help me if there are complications after surgery	1.74	2.09	2.05	1.71	<.001
I believe all the claims made in this statement are accurate	1.29	2.13	2.00	2.01	<.001

^aThe P values presented are the significance of the testing of interactions comparing the difference between surgeon-peers and naïve subjects, and the differences in their responses to each question for self-promoters and non-self-promoters.

certified orthopedic surgeons and naïve individuals. These websites contain varying amounts of information presented in numerous ways. While we did not poll the website authors regarding their intent, the purpose of a website seems naturally to communicate believable information to the public. The information provided ranges widely from basic facts regarding education and contact information to statements regarding technical skills, reputation, television appearances, and the friendly nature of the office staff.

Our results suggest that board-certified orthopedic surgeons, peers of the writers of these websites, tend to view self-promoting surgeons more negatively than do their nonphysician counterparts. These findings support our hypothesis that self-promoting surgeons are perceived more favorably by the naïve, nonphysician population.

At first glance, our results suggest that the mere absence of a surgeon from the medium may affect the patient's choice, because 50% of our naïve respondents indicated that they would use the Internet to choose a doctor. Interestingly, both the surgeon-peer group and naïve subjects were equally aware that misinformation exists on the Internet. However, when reviewing the websites, naïve subjects were significantly more likely to view self-promoters as more competent, more excellent, and more likely to provide quality care, and were more likely to choose the self-promoter if they needed surgery compared to the surgeon-peer group. The naïve group viewed self-promoters as less likely to inflate their technical skills but more likely to be arrogant. They viewed self-promoters as more likely to help if things went wrong and more likely to make accurate statements compared to the surgeon-peer group. This suggests that patients with little experience are more likely to choose a self-promoting physician than one who does not self-promote for reasons that cannot be proven true or false in the confines of a website. Further study is needed to see if perceptions based on web content translate into actual changes in healthcare choices.

This study had several limitations. Though statistically sound, the sample size of 45 people was small and should likely be expanded in further investigations to allow for analysis of demographics and socioeconomic factors. The study focused only on the text content of websites and purposely removed the influences of the other potential content mentioned previously. While a biography serves as an introduction, further research

is needed to determine how initial perceptions affect future perceptions throughout the course of the patient-physician relationship. The small number of Internet biographies used cannot represent the vast array of information that could be displayed in numerous ways, but was necessary given the length of time donated by each uncompensated subject (1-2 hours). To minimize complexity, we purposefully ignored websites in the middle, somewhere in the continuum between self-promoting and non-self-promoting. Instead we selected websites that would be stark in their self-promotion to allow for the assessment of our hypothesis. Finally, this study was not designed to address economic implications of promotional advertising. The goal of much advertising is to generate revenue, and in the case of orthopedic surgery, one goal is likely attracting more patients, but this effect is beyond the scope of the current study. Given the elective nature of many orthopedic surgery procedures, the effect of promotional websites on a person's decision to have surgery or not is an important topic for future study.

Taken together, the data suggests a profound influence of the content of the Internet website in the impressions made on different groups of people. These facts, although profound in their influence and unregulated by the medical profession, present both great opportunities and liabilities. The opportunities arise from the professional community to help guide what surgeons do to generate interest on the Internet. The liabilities arise on consideration of the consequences of self-promotion in the setting of real world surgical complications.

Dr. Mohney is a resident in Emergency Medicine, University of Pittsburgh Medical Center, Pittsburgh, Pennsylvania. Dr. Lee is a resident in Orthopaedic Surgery, Washington University, St. Louis, Missouri. Dr. Elfar is Associate Professor of Orthopaedic Surgery, University of Rochester Medical Center, Rochester, New York.

Address correspondence to: John C. Elfar, MD, Department of Orthopaedic Surgery, University of Rochester Medical Center, 601 Elmwood Avenue, Box 665, Rochester, NY 14642 (tel, 585-273-3157; fax, 585-276-1134; email, openelfar@gmail.com).

Am J Orthop. 2016;45(4):E227-E232. Copyright Frontline Medical Communications Inc. 2016. All rights reserved.

References

1. Tomycz ND. A profession selling out: lamenting the paradigm shift in physician advertising. *J Med Ethics.* 2006;32(1):26-28.
2. The principles of medical ethics of the Association of American Physicians and Surgeons. Association of American

- Physicians and Surgeons Web site. http://www.aapsonline.org/index.php/principles_of_medical_ethics. Accessed September 20, 2013.
- Opinion 5.027 – Use of health-related online sites. American Medical Association Web site. <http://www.ama-assn.org/ama/pub/physician-resources/medical-ethics/code-medical-ethics/opinion5027.page>. Accessed September 10, 2013.
 - Standards of professionalism. Advertising by orthopaedic surgeons. Adopted April 18, 2007. American Academy of Orthopaedic Surgeons Web site. http://www.aaos.org/cc_files/aaosorg/member/profcomp/advertisingbyos.pdf. Accessed May 6, 2016.
 - Mostaghimi A, Crotty BH, Landon BE. The availability and nature of physician information on the internet. *J Gen Intern Med*. 2010;25(11):1152-1156.
 - Ad Hoc Committee on Health Literacy for the Council on Scientific Affairs, American Medical Association. Health Literacy: Report of the Council on Scientific Affairs. *JAMA*. 1999;281(6):552-557. doi:10.1001/jama.281.6.552.
 - Leroy G, Endicott JE, Mouradi O, Kauchak D, Just ML. Improving perceived and actual text difficulty for health information consumers using semi-automated methods. *AMIA Annu Symp Proc*. 2012;2012:522-531.
 - Dixon PR, Grant RC, Urbach DR. The impact of promotional language on patient preference for innovative procedures. *J Am Coll Surg*. 2013;217(3):S100.
 - Landis JR, Koch GG. A one-way components of variance model for categorical data. *Biometrics*. 1977;33(4):671-679.

Appendix. Survey Questions

Rate each item on the scale shown to indicate your level of agreement.

- The author of this statement is competent.
 Strongly disagree Disagree Agree Strongly agree
- The author of this statement is an excellent surgeon.
 Strongly disagree Disagree Agree Strongly agree
- The author of this statement would provide you with quality care.
 Strongly disagree Disagree Agree Strongly agree
- You would choose this surgeon if you needed surgery.
 Strongly disagree Disagree Agree Strongly agree
- The author of this statement inflates his or her technical skills.
 Strongly disagree Disagree Agree Strongly agree
- The author of this statement is arrogant.
 Strongly disagree Disagree Agree Strongly agree
- You expect that this doctor has NO sanctions against his or her medical license.
 Strongly disagree Disagree Agree Strongly agree
- I believe this doctor will help me if things go wrong with surgery.
 Strongly disagree Disagree Agree Strongly agree
- I believe all the claims made in this statement are accurate.
 Strongly disagree Disagree Agree Strongly agree
- I am aware that misinformation about doctors exists on the Internet.
 Yes No

This paper will be judged for the Resident Writer's Award.