

# The Availability and Nature of Physician Information on the Internet

Arash Mostaghimi, MD, MPA<sup>1,2</sup>, Bradley H. Crotty, MD<sup>1</sup>, and Bruce E. Landon, MD, MBA, MSc<sup>1,3</sup>

<sup>1</sup>Division of General Medicine and Primary Care, Beth Israel Deaconess Medical Center, Boston, MA, USA; <sup>2</sup>Department of Dermatology, Harvard Medical School, Boston, MA, USA; <sup>3</sup>Department of Health Care Policy, Harvard Medical School, Boston, MA, USA.

**BACKGROUND:** Although patients are commonly using the Internet to find healthcare information, the amount of personal and professional physician information and patient-generated ratings freely accessible online is unknown.

**OBJECTIVE:** To characterize the nature of online professional and personal information available to the average patient searching for physician information through a standardized web search.

**DESIGN, SETTING, AND PARTICIPANTS:** We studied 250 randomly selected internal medicine physicians registered with the Massachusetts Board of Registration in Medicine in 2008. For each physician, standardized searches via the Google search engine were performed using a sequential search strategy. The top 20 search results were analyzed, and websites that referred to the study subject were recorded and categorized. Physician rating sites were further investigated to determine the number of patient-entered reviews.

**MAIN MEASURES:** Number and content of websites attributable to specific physicians.

**KEY RESULTS:** Websites containing personal or professional information were identified for 93.6% of physicians. Among those with any web sites identified, 92.8% had professional information and 32.4% had personal information available online. Female physicians were more likely to have professional information available on the Internet than male physicians (97.5% vs. 91.7%,  $p=0.03$ ), but had similar rates of available personal information (32.5% vs. 32.5%,  $p=ns$ ). Among personal sites, the most common categories included social networking sites such as Facebook (10.8% of physicians), hobbies (10.0%), charitable or political donations (9.6%), and family information (8.8%). Physician rating sites were identified for 86.4% of providers, but only three physicians had more than five reviews on any given rating site.

**CONCLUSIONS:** Personal and professional physician information is widely available on the Internet, and often not under direct control of the individual physician. The availability of such information has implications for physician-patient relationships and suggests that physicians should monitor their online information.

**KEY WORDS:** physician characteristics; Internet; quality of care; information technology.

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## INTRODUCTION

The shift toward electronic media for storing and communicating information coupled with expanding Internet access and improved search technology has led to unprecedented access to information online.<sup>1</sup> Recent surveys from the Pew Internet and American Life Project demonstrate that nearly three out of four Americans reported “going online” in the past year, and of these, 75% reported that they use the Internet to find health information.<sup>2,3</sup> Access to the Internet via broadband continues to increase among all age groups, with over 75% of Americans aged 12–49 and 30% over the age of 70 having constant Internet access within their home in 2008.<sup>4</sup>

The availability of online health information oriented towards patients and the development of comprehensive health information portals has resulted in profound changes in the ways that patients seek health information.<sup>5–9</sup> Nearly all chronic medical conditions now have their own online support and advocacy groups.<sup>10,11</sup> Patients also can research their physicians and health care institutions online by examining quality reports of hospitals and patient reviews of doctors prior to their visits.<sup>12,13</sup>

While the accessibility of clinical information will undoubtedly improve decision support for patients, the availability of personal information on health care providers might enable patient access to aspects of physicians’ lives that were previously considered beyond the scope of the traditional physician-patient relationship.<sup>14,15</sup> Thus, as the amount of information on the Internet increases, physicians must understand the prevalence and types of information referable to them, as this may have professional implications for their relationships with patients.<sup>16</sup> The aim of this study is to describe and characterize the nature and extent of professional and personal online content available to the average patient searching for physician information through a standardized web search.

## METHODS

### Overview

We performed Internet searches on a randomly selected sample of physicians practicing in the state of Massachusetts. Using a

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*Drs. Mostaghimi and Crotty contributed equally to this work.*

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standardized sequential search strategy, we recorded available information about search results and websites patients might encounter if searching for their physicians on the Internet, and analyzed the relationship between physician demographic characteristics and the availability of such information.

### Study Population

We randomly selected 250 physicians self-identifying as practicing internal medicine (including both general internists and subspecialists) who were registered with the Massachusetts Board of Registration in Medicine as of 7/20/08. For each sampled physician, we obtained basic demographic information including practice location, date of licensure, practice type, medical school, year of graduation, and specialty. Gender and sole proprietor status were obtained from the National Plan and Provider Information System (<https://nppes.cms.hhs.gov/>). Population sociodemographic data for the principal practice location were obtained from the U.S. Census Bureau.<sup>17</sup> The study was approved by the Institutional Review Board at Beth Israel Deaconess Medical Center.

### Search Criteria

For each physician, we performed Internet searches with the Google search engine using a standardized search strategy between 11/1/08–12/30/08.<sup>18</sup> Google was selected given its ubiquity and over 70% market share in search. The physician’s full name (“<first> <last>”) was used as the primary search term. Search engine user behavior from marketing research suggests that most web searchers do not go beyond the first page of results and that a full 81% never go beyond the second page.<sup>19</sup> We therefore restricted our results to the top twenty (two pages) of search results with the goal of identifying what a patient performing the most basic search on a physician may find, not what a comprehensive search may uncover. A website was judged to be referable to the study physician on the basis of a matched name with one or more additional identifying data points, such as practice location or address, and these were recorded and categorized. If we were unable to validate the website using these methods, the site was excluded from analysis. A second Internet search with the physician’s full name preceded by “Dr.” was performed for physicians who did not have any referable websites with the initial search, and these data were combined with the initial search. All browser cookies and cache were cleared prior to performing each search. All of the data were collected and reviewed in tandem by two authors (AM, BC).

### Categorizing Results

We first categorized websites attributable to the provider as containing personal or professional information (Table 1). All categories were formulated on an a priori basis. Professional subcategories included curriculum vitae or biography/profile, articles (professional), articles (lay press), awards, quality rating sites, and disciplinary action. Quality rating sites were defined as websites retrieved by the search engine that either offered consumer survey results or data on quality of care

Table 1. Categories of Online Information

Category	Example
Professional	
Professional Information	Office directions, practice hours, contact information, referral guidelines
CV or Biography/Profile	Official or academic profile
Articles (Professional)	Peer-reviewed articles written by the physician
Articles (Lay Press)	Articles about or written by the physician for a general audience
Awards	Professional awards
Quality Rating Sites	Websites with hospital or training rankings and/or user ratings
Disciplinary Action	Board of medicine official censure or case review.
Personal	
Social Networking	Facebook, LinkedIn, Plaxo, or Friendster profiles
Blog	Blogger, Xanga websites
Donations	Political campaign, religious, and non-profit contributions
Religious	Religious affiliations, events
Family	Invitations to children’s parties, articles about children’s activities
Hobbies	Running club, book club homepages
Financial	Purchase or sale of land or business, physician salary on nonprofit tax filings
Address	Home address

measures, and whose information was at minimum partially accessible, free of charge, to the public. Thus, websites such as Angie’s List ([www.angieslist.com](http://www.angieslist.com)) that require a paid subscription were not included in our analyses. Personal subcategories included entries on social networking sites, blogs, recordings of political or charitable donations, religious activities, family, hobbies, and financial interests. Social network sites were counted if they had identifiable information (e.g. location or image that could be corroborated). Fully private sites were not counted. Websites that fit into multiple categories (n=16 of 193 unique websites) were placed into a maximum of two categories.

### Quality Rating Site Assessment

Quality rating sites were reviewed in further detail to ascertain the number of reviews. The three most commonly encountered quality rating sites that accepted patient reviews (Healthgrades, RateMDs, Wellness.com) were further analyzed and the number of individual reviews available for each physician was recorded.

### Analyses

Our analyses were descriptive. Differences for continuous variables were tested using two-tailed t-tests and for categorical variables using chi-square tests. The data were analyzed using Stata 10.0 (Stata Corp., College Station, Texas).

## RESULTS

Of 250 providers included in our sample, 32% were female, and the median number of years since medical school

graduation was 18. The majority (59.2%) self-identified as general internists (Table 2). This is representative of the overall population of Massachusetts internists, 35% of whom are female, and 53% of whom self-identify as primary care physicians.<sup>20,21</sup>

We identified websites for 234 physicians (93.6%) using the two-step sequential search process. Among those with any web sites identified, 232 (92.8%) had professional information online and 81 (32.4%) had personal information online. Female physicians were more likely to have professional information available on the Internet than male physicians (97.5% vs. 91.7%,  $p=0.03$ ), but had similar rates of having personal information available (32.5% vs. 32.5%,  $p=ns$ ). There were no other significant differences according to physician demographic characteristics including practice location and specialty.

## Professional Information

We identified a total of 1,837 search results with professional information pertaining to 232 of the physicians in our cohort, for an average of 7.9 sites per physician. The largest numbers of web sites identified were from quality rating sites (45.6%), found for 216 (86.4%) physicians (Table 3). Professional publications [16.5%, identified for 77 (30.8%) physicians] and professional information [14.1%, identified for 108 (43.2%) physicians] were the next two largest categories. Disciplinary action accounted for 0.4% of all hits and was noted for three physicians.

## Personal Information

Eighty-one physicians (32.4%) had personal information available online with a total of 209 unique web sites. Among these

81 physicians, the average number of personal sites identified was 2.6. The most common categories included hobbies (2.5% of all sites identified for 25/250 physicians), social network sites such as Facebook and Linked-In [2.2% of all sites identified for 27/250 physicians], and charitable or political donations [1.8% of all sites identified for 24/250 physicians]. Family (1.4%) and financial (0.6%) information were also identified for 22 (8.8%) and 12 (4.8%) physicians respectively (Table 3).

## Provider Quality Rating Sites

Healthgrades included information on the largest number of physicians (178 or 71% of the sample), with only 48 (38.4%) for Wellness.com and 33 (13.2%) for RateMD (Table 4). Of the 178 physicians with Healthgrades ratings, however, 119 (67%) had no patient reviews and another 50 (28%) had between 1–4 reviews. Only three physicians had more than five reviews on any of the ratings sites.

## DISCUSSION

Our cross-sectional study of Massachusetts internal medicine physicians showed that professional and personal information about physicians is widely and publically available on the Internet. Although we expected to find online professional content for most physicians, we also found personal information online for almost one-third of the physicians. Of these physicians, one-third had personal content that was clearly

Table 2. Physician Characteristics and Availability of Professional and Personal Online Information

	Total Number of Physicians (%)	Physicians with any Results (%)	Physicians with Professional Results (%)	Physicians with Personal Results (%)
Total	250 (100)	234 (93.6)	232 (92.8)	81 (32.4)
Gender				
Male	169 (67.6)	155 (91.7) <sup>a</sup>	154 (91.1)	55 (32.5)
Female	80 (32.0)	78 (97.5) <sup>a</sup>	77 (96.25)	26 (32.5)
Unknown	1 (0.4)	0 (0)	0 (0)	0 (0)
Years Since Graduation (Median= <sup>a</sup> 18)				
≥18	129 (48.4)	112 (92.6)	112 (92.6)	43 (35.5)
<18	121 (51.6)	125 (96.9)	123 (95.3)	40 (31.0)
Population of City of Practice				
<100,000	117 (46.8)	107 (94.5)	107 (94.5)	33 (28.2)
100,000–500,000	40 (16.0)	39 (97.5)	38 (95.0)	13 (32.5)
>500,000	93 (37.2)	88 (94.6)	87 (93.5)	39 (38.7)
Location of Practice				
Hospital-Based	64 (25.6)	61 (95.3)	61 (95.3)	24 (37.5)
Partnership or Group	52 (20.8)	51 (98.1)	50 (96.2)	16 (30.8)
Private Office	44 (17.6)	40 (90.1)	35 (89.7)	13 (33.3)
Other	37 (14.8)	35 (94.6)	35 (94.6)	8 (21.6)
Unknown	53 (21.2)	47 (88.7)	47 (88.7)	18 (34.0)
Location of Medical School				
United States	188 (75.2)	175 (93.1)	173 (92.0)	63 (33.5)
Foreign	55 (22.0)	53 (96.4)	53 (96.4)	18 (32.7)
Unknown	7 (2.8)	6 (85.7)	6 (85.7)	1 (14.3)
Subspecialty Status				
General Medicine	148 (59.2)	137 (92.6)	135 (91.2)	56 (37.8)
Subspecialty	94 (37.6)	90 (95.7)	90 (95.7)	26 (27.7)
Unknown	8 (3.2)	7 (87.5)	7 (87.5)	0 (0)

<sup>a</sup> Difference between groups significant at  $p<0.05$

Table 3. Number and Percentage of Websites and Physicians with Professional and Personal Content

	Total Results (%)	Physicians with Results (%)	Average Results among Physicians with Results in Category (± Standard Deviation)
<b>Professional</b>	<b>1837 (89.8)</b>	<b>232 (92.8)</b>	<b>7.9±6.3</b>
Quality Rating Sites	933 (45.6)	216 (86.4)	4.3±3.3
Articles (Professional)	338 (16.5)	77 (30.8)	4.4±4.0
Professional Information	288 (14.1)	108 (43.2)	2.7±2.1
CV or Biography/Profile	126 (6.2)	80 (32.0)	1.6±0.9
Articles (Lay Press)	122 (6.0)	49 (19.6)	2.5±2.3
Awards	21 (1.0)	15 (6.0)	1.4±0.8
Disciplinary Action	9 (0.4)	3 (1.2)	3.0±2.34
<b>Personal</b>	<b>209 (10.2)</b>	<b>81 (32.4)</b>	<b>2.6±2.0</b>
Hobbies	52 (2.5)	25 (10.0)	2.1±1.5
Social Networking	45 (2.2)	27 (10.8)	1.7±1.1
Donations	36 (1.8)	24 (9.6)	1.5±1.0
Family	29 (1.4)	22 (8.8)	1.3±0.7
Political	15 (0.7)	12 (4.8)	1.3±0.8
Financial	13 (0.6)	10 (4.0)	1.3±0.8
Religious	9 (0.4)	8 (3.2)	1.1±0.6
Home Address	8 (0.4)	8 (3.2)	1.0±0.5
Blog	2 (0.1)	2 (0.8)	1.0±0.5

under their control (e.g., social networks and blogs) whereas the remainder of the personal links were largely the result of affiliations with larger organizations (e.g., clubs, religious organizations) or the digitization of public databases and reports (e.g., political and private donations, real estate transactions).

Quality rating sites, which were the most widely available sites that we identified, represent a large source of professional information that is outside of physician’s control. Despite the frequency with which these sites were identified, the extent of information available was limited. Only three physicians had five or more reviews. Thus, physician rating pages are not likely to be representative of average patient experiences and consumers who rely on quality rating sites may be basing their choices on erroneous or incomplete information.<sup>22,23</sup>

Websites containing personal physician information raise additional concerns. The issue of electronic physician disclosure is analogous but distinct from its offline counterpart. Recent studies have demonstrated that physician self-disclosure has a negative impact on patient satisfaction and ability to share health-care concerns with their primary care physician.<sup>16</sup> Most physicians limit their self-expression during patient encounters: few physicians would wear a political pin, discuss their ongoing litigation with their neighbor, or detail their charitable contributions during a patient encounter. Our study demonstrates, however, that this type of information could easily be found with a single limited Internet search.

These findings force us to reconsider professionalism in this digital age. We agree with previous recommendations of performing electronic “self-audits” to find what information is available online, and seeking to correct erroneous information.<sup>14,15</sup> In addition, physician should carefully monitor the web content under their control and understand that their patients will have access to much of it. Since much of the personal information is outside of individual control, however, being aware of the information that exists and is accessible is an important first step for physicians to take. Given the popularity of social networking among college and medical students, incorporating lessons in digital professionalism into existing medical school curriculums also may prove beneficial in providing guidance to students engaged in online sharing of personal information.<sup>24</sup> Physicians should consider their online profile as an extension of their practice within reasonable limits, and content under the control of the physician should be continually evaluated to meet with professional standards, even in colloquial blog posts and social networks.

Our study is subject to several limitations. First, the study population included only Massachusetts physicians specializing in internal medicine, and therefore may not be generalized to the national population of physicians. Second, search engine rankings are dynamic and can change over time, and searches replicated today may differ. Third, we only included the first twenty hits, which might bias our results against low-traffic content such as local websites or blogs. Finally, although we have established the availability of physician information online, there are no data on the role of Internet searches in the selection of a physician or the effect of available information on the physician–patient relationship.

In conclusion, a significant majority of physicians have online information accessible through a standard Internet search of their name. Approximately one-third of physicians also have personal content viewable online. The impact of both deliberate and accidental physician disclosure on the patient–physician relationship suggests that physician disclosure on the Internet may require physicians to carefully consider the nature and content of information about them that is easily available to their patients in our digital age, and monitor their behavior in an effort to control the dissemination of information

Table 4. Ratings and Reviews for the Top Three Ratings Sites

	Healthgrades	RateMD	Wellness
Physicians with ratings site (%)	178 (71.2)	33 (13.2)	48 (38.4)
Physicians with a rating or review (%)	53 (29.8)	13 (39.4)	1 (2.1)
0 Reviews	119	20	47
1–4 Reviews	50	13	1
5–9 Reviews	1	0	0
10+ Reviews	2	0	0
Total Number of Reviews	130	27	1

that they consider private. Further research is required to understand the effect of on-line information on the patient-physician relationship.

**Conflict of Interest:** None disclosed.

**Corresponding Author:** Bruce E. Landon, MD, MBA, MSc; Department of Health Care Policy, Harvard Medical School, 180 Longwood Avenue, Boston, MA 02115, USA (e-mail: landon@hcp.med.harvard.edu).

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