Patient Preferences and Utilization of Online Resources for Patients Treated in Hand Surgery Practices

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Abstract

Background: The Internet is a widely used resource by patients however, objective data on details such as frequency of usage and specific sites visited is lacking. We surveyed patients from hand surgery practices to describe patient preferences and utilization patterns for online resources. **Methods:** From October 2015 to June 2016, we enrolled patients presenting to 4 orthopedic hand surgeons at 2 academic institutions. Patients completed a survey, with questions related to their preference for learning about their diagnosis and Internet utilization both before and after the visit. **Results:** A total of 226 patients were enrolled in the study. Forty-five percent of the patients had done online research prior to the office visit, and 81% preferred to learn about their diagnosis through verbal communication, as opposed to only 8% who listed Web site information. Fifty percent indicated that there was a greater than 50% chance or they would definitely seek additional information on the Internet after the office visit. When asked to choose from a list of Web sites to visit, the most popular Web site was WebMD. Specialty society Web sites (American Society for Surgery of the Hand and American Academy of Orthopaedic Surgeons) were less popular. **Conclusions:** This survey-based study found that a majority of patients utilize the Internet both before and after the office visit; however, they often utilize unregulated sites for information. This information can help physicians guide patients to high-quality Web sites for information on their clinical diagnosis and treatment.

Keywords: Internet, patient preferences, patient education, online resources, hand surgery

Introduction

The Internet is a widely used resource by patients for health-related information. The Pew Research Center showed in 2012 that 59% of patients have looked online for health information and 35% have looked online to make a diagnosis.⁶ Most believe those percentages are notably higher in 2016 as patients are increasingly researching their conditions both before and after evaluation by a health professional.^{2,3,13} Although physician specialty societies, such as the American Academy of Orthopaedic Surgeons (AAOS) and the American Society for Surgery of the Hand (ASSH), aim to provide information online that is both reliable and accurate, patient awareness and usage of these Web sites are unknown.¹⁰ Patients often turn to more accessible Web sites, such as Wikipedia and WebMD, but the reliability of information on these sites is uncertain.^{7,12,19} Given the concerns for both accessibility and reliability of online information, there have been calls for the orthopedic community

to develop high-quality, appropriately readable online patient information.⁵ In addition, patient engagement in his or her own care has been shown to improve satisfaction, quality of life, and disease-specific outcomes.^{1,11,20}

Use of online resources allows patients to conveniently engage in their own care. Although ensuring accessibility, reliability, and readability of online information is important to facilitate patient engagement, a better understanding of patient preferences of online resources, what information they seek to answer, and the role this plays in their decision making is needed. In the current study, we surveyed patients

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Data Collection Sheet	
1. What is your age? _____	_____eMedicine _____Healthline _____University Website _____Other (please list) _____ _____I don't know what sites I will visit
2. What is your gender: Male Female	
3. Highest level of education (partial/ complete): High school College Graduate school	
4. Did you have a diagnosis given to you by a physician before your visit today? Yes No	12. Did you search about your condition online prior to your visit today? Yes No
What was your given diagnosis? _____	****If no, the questionnaire is complete. Thank you. If yes, please continue.
5. If yes, how confident were you of this diagnosis before you saw the hand surgeon? 1 ----- 2 ----- 3 ----- 4 Not Mildly Moderately Very Confident	1. If you did not see another MD and if you generated a diagnosis for your condition through your own research on the Internet before your visit to Rush University Hand Surgeon was it: correct or incorrect
6. If yes, who made this diagnosis before your visit today? (check all that apply)	2. Where did you complete your search? Smartphone Computer Both
_____ Emergency Room _____ Primary Care Physician _____ Hand Surgeon _____ Orthopedic Surgeon (not hand) _____ No one	3. Which search engine did you use? Google Bing Yahoo Ask! Other _____
7. If you were not given a diagnosis by a physician before seeing the hand surgeon, did you make your own likely diagnosis? Yes No	4. Which website did you primarily use for your search? (check all that apply, and circle the best- your favorite) _____ American Academy of Orthopedic Surgeons (orthoinfo) _____ American Society for Surgery of the Hand (assh) _____ eMedicine _____ Healthline _____ Mayo Clinic _____ Web MD _____ Wikipedia _____ University Website _____ Other (please list) _____ _____ I don't remember what site(s) I used
What diagnosis did you come up with? _____	5. How long did you spend online researching your medical condition? _____ 30 minutes or less _____ 1 hour _____ 2 hours _____ More than 2 hours
8. If you made your own diagnosis, was it based on information from the Internet? Yes No	6. How useful did you find your online research (if applicable): 1 ----- 2 ----- 3 ----- 4 Not at all Mildly Moderately Very Useful
9. What is your preferred way to learn more about your diagnosis? Number 1-5 (1 is favorite, 5 least) _____ Verbal explanation by your physician _____ Website _____ App on phone _____ Paper handout _____ Ask family and friends	7. Why was the search not as helpful as you would have liked? (Check all that apply) _____ The information did not seem to come from a reliable source _____ I could not find useful information to help me make/ understand my diagnosis _____ I could not find useful information on treatment of my diagnosis _____ The information was written in a medical format that was difficult to understand
10. Did your doctor recommend surgery for you today?	8. If you looked at the Department site what was the main reason you went to our site? (check all that apply) _____ Find our phone number _____ To make an appointment _____ To find directions to office _____ Learn more about my doctor _____ Learn more about my diagnosis
11. How likely are you to go online after your visit today for additional information about your condition? (please choose one answer) _____ Definitely _____ Better than 50% chance _____ 50% chance or less _____ Definitely not	
If so, which site or sites do you plan to visit? (check all that apply) _____ Mayo Clinic _____ Web MD _____ Wikipedia _____ American Academy of Orthopedic Surgeons (orthoinfo) _____ American Society for Surgery of the Hand (assh)	

Figure 1. Representative survey administered to new patients.

from hand surgery practices at 2 academic institutions to describe patient preferences and utilization patterns for online resources related to hand surgery conditions. The goal is to identify what information patients research on the Internet, which resources they use, and how this information can be tailored to better improve patient education and decision making.

Methods

The Institutional Review Board of both institutions approved this study, and informed consent was obtained. Over an 8-month time period from October 2015 to June 2016, we enrolled adult patients presenting as outpatients to 4 orthopedic hand surgeons at each of 2 Midwest academic medical centers in different metropolitan areas. Each patient with a new isolated diagnosis of phalanx/metacarpal fracture, distal radius fracture, lateral epicondylitis, trigger finger, thumb carpometacarpal joint arthritis, or carpal tunnel syndrome was approached for participation in this study. These diagnoses were chosen, as the ASSH publishes information regarding these common diagnoses, and treatment recommendations are similar across different Internet resources. All efforts were made to recruit consecutive patients presenting with the above-listed diagnoses.

After informed consent was obtained, a paper questionnaire was given to the patients (Figure 1). In addition to demographic information, questions included patient preferences for learning about their diagnosis, the likelihood of using the Internet after the office visit, which resources they use on the Internet, whether patients conducted online research prior to the office visit, and whether they had arrived at a self-diagnosis prior to seeing their hand surgeon.

Descriptive statistics were tabulated after compilation of the survey data. Due to the exploratory nature of the study design with a lack of data to allow a more formal analysis, we did not conduct any comparative/inferential statistical analysis. Enrollment was continued until preliminary review of the data indicated data saturation. Although no formal power analysis was performed, data saturation was estimated based on similar previous survey-based studies.^{8,16,18}

Results

A total of 226 patients were enrolled in the study. The average age was 50 years (range = 18-83 years), and 62% were female. The majority of patients (56%) marked college as the highest level of completed education; 26% had completed graduate education and 19% had completed

Table 1. The Portion of Patients Who Performed Online Research Prior to Initial Clinical Visit.

	Had done online research ahead of visit
Elective conditions	
Carpal tunnel	24 of 42 (57%)
Carpometacarpal arthritis	20 of 39 (51%)
Trigger finger	25 of 52 (48%)
Lateral epicondylitis	10 of 31 (32%)
Traumatic conditions	
Distal radius fracture	12 of 31 (39%)
Metacarpal fracture	6 of 23 (26%)
Phalanx fracture	4 of 11 (36%)

high school education only. Elective/nontraumatic conditions comprised 73% of the diagnoses, including trigger finger/thumb (52 patients), carpal tunnel syndrome (42 patients), thumb carpometacarpal joint arthritis (39 patients), and lateral epicondylitis (31 patients). The traumatic diagnoses comprised the other 27%, including phalanx/metacarpal fracture (34 patients) and distal radius fracture (31 patients).

Previsit Online Research

Nearly half (45%) of the patients had done online research prior to the office visit (Table 1). This includes 79 of 164 (48%) patients with elective conditions and 22 of 65 (34%) patients with traumatic conditions. Among men, 45% went online prior to the office visit. Similarly, among women, 44% did online research prior to their clinic visit. Fifty-four percent of patients under the age of 50 did prior online research. However, by comparison, only 38% of patients over the age of 50 used an online resource prior. Of those who performed Internet searches, 53% reported it to be moderately or very useful, and 47% (48 patients) reported that the search was not as helpful as they would have liked. Of these 48 patients, 16 stated that the source was not reliable, 19 stated that they could not find useful information regarding their diagnosis, 10 stated that they could not find useful information regarding treatment options, and 3 stated that the content was difficult to understand. Twenty-two of 65 patients (34%) with a traumatic condition had searched the Internet prior to their visit, compared with 79 of 164 (48%) of those with an elective condition.

Self-Diagnosis

Nearly one-third (30%) of all patients who went on the Internet to research their complaint arrived at a self-diagnosis prior to their office visit. This self-diagnosis was correct 88% of the time compared with the diagnosis received from their hand surgeon.

Preferences for Learning About the Diagnosis at and After Their Office Visit

Most (81%) patients preferred to learn about their diagnosis through verbal communication with their hand surgeon, as opposed to only 8% who listed Web site information as their first preferred source (Figure 2). Of those who selected a second-most preferred way of learning about their diagnosis, 45% selected a Web site and 27% selected a paper handout.

Half of the respondents indicated that there was a greater than 50% chance that they would definitely seek additional information on the Internet after the office visit (Figure 3). Approximately one-quarter of patients indicated that they would definitely not seek additional information from the Internet after their clinic visit. Sorting by gender, 61% of males said there was greater than 50% chance that they would seek additional Internet research, compared with only 43% of females. In addition, sorting by age, 50% of patients under age 50 indicated that there was a greater than 50% chance they would seek additional online information which is comparable with the 47% of patients over age 50.

Forty-two of 65 (64%) patients with a traumatic condition planned to go online after the visit compared with 72 of 163 (44%) of those with an elective condition (Table 2).

Preferred Web Sites

When asked to choose from a list of Web sites to visit, the most popular Web site was WebMD (picked by 118 respondents), followed by the Mayo Clinic Web site (picked by 84 respondents). Specialty society Web sites (ASSH and AAOS) were less popular (Figure 4). The study location's academic department Web sites were infrequently used for medical information—The most frequently cited reasons for using the department's Web site were to find the department's phone number, to make an appointment, or to learn more about their doctor.

Discussion

The Internet is a valuable information resource and can be an important tool in empowering patients. Specialty societies have recognized the potential role of the Internet in patient education and have dedicated substantial resources toward making patient-oriented education materials readily available (eg, the ASSH's HandCare Web site and the AAOS's OrthoInfo Web site). However, there is relatively little understanding of how patients prefer to receive information about their conditions and whether they prefer to access information on the Internet. It is notable that over 80% of patients in our survey indicated that their preferred means of learning about their diagnosis is from a physician, with less than 10% selecting a Web site as their preferred

Figure 2. Patient preference for communication of clinical diagnosis and explanation of the condition.

Figure 3. Patient listed preferred Web sites (number of patients).

Note. ASSH = American Society for Surgery of the Hand; AAOS = American Academy of Orthopaedic Surgeons.

Table 2. The Portion of Patients Who Planned to Perform Online Research After Their Initial Clinical Visit.

	Planned to go online after visit (definitely or >50% chance)
Elective conditions	
Carpal tunnel	18 of 41 (44%)
Carpometacarpal arthritis	16 of 39 (41%)
Trigger finger	25 of 52 (48%)
Lateral epicondylitis	13 of 31 (42%)
Traumatic conditions	
Distal radius fracture	18 of 31 (58%)
Metacarpal fracture	16 of 23 (70%)
Phalanx fracture	8 of 11 (73%)

method. This suggests that patients are more likely to rely on the information given to them by their physician and use online resources as a supplement. Indeed, half of patients in our study indicated that they would likely access information on the Internet following their office visit. Although our methods did not allow us to perform a comparative analysis, it appears that potentially more patients with an elective condition (compared with a traumatic condition) accessed information on the Internet prior to their hand surgeon visit (48% vs 34%). Conversely a higher number of traumatic condition patients planned to visit the Internet for information after their visit (64% vs 44%). One explanation for this difference is that patients seen for traumatic conditions have only been symptomatic for a short period of time

Figure 4. Patient likelihood of going online after clinic office visit.

compared with elective conditions, and thus may have not had sufficient time for research. Although a majority of patients indicated that they prefer to learn about their diagnosis from a physician, patients may supplement and further research their diagnosis after the physician visit. These trauma patients likely represent the highest yield group of patients for the physician to educate regarding the condition and also to direct to high-quality online resources.

It should be noted that the information accessed online may contradict what patients are told in their office visits. Jariwala et al administered a questionnaire in the orthopedic outpatient fracture clinic; 70% of patients reported that the medical information obtained on the Internet was different from what they were told by their physician in consultation.¹⁷ The discordance between what patients have encountered on the Internet and what the physician told them may be related to the information that the patients accessed. Prior work indicates that the accuracy of information on the Internet may depend on the search terms used.^{9,10}

Although many patients use the Internet to seek information about specific conditions and treatment options,²¹ some patients may use diagnosis-generating tools on frequently accessed sites (such as WebMD) that may be misleading.¹³ Nearly one-third of patients in our study arrived at a self-diagnosis prior to seeing the hand surgeon. This is notable because patient expectations for management may have already been set by the materials they encountered online, and hand surgeons may be faced with the potentially difficult task of counseling a patient with preconceived notions that differ from the surgeon's opinion. The role of expectations in influencing outcomes in hand surgery is increasingly recognized, and the practicing surgeon must be familiar with the content of frequently accessed online

materials.^{4,14,15} Patients in our study were most likely to access information from WebMD and Mayo Clinic, with less than one-fifth of patients utilizing the AAOS or ASSH Web site. Hand surgeons may benefit from reading the information available on WebMD and Mayo Clinic to familiarize themselves with what their patients are reading. In addition, surgeons may begin to suggest to patients that they should care to seek additional information online and that they use resources such as ASSH and AAOS. Surgeons in practice may either direct patients toward a personal Web site with links to informational Web sites such as ASSH or AAOS, or may guide them by other means such as instructional pamphlets which include ASSH or AAOS Web sites specific to a patient's diagnosis. By directing patients toward reliable, accurate Web sites, physicians may reduce some of the discordance between patient's understanding and expectations, and the physicians' understanding and expectations.

In addition, it is questionable what information patients seek on the Internet. Shuyler et al were able to perform a content analysis of search queries at the University of Washington's Department of Orthopaedics Web site. They found that the most common queries were done to determine information about a condition, information about treatment, information about symptoms, advice about symptoms, and advice about treatment.²¹ Patients actively seek information about their diagnosis and treatment options, sometimes using tools such as WebMD to create a diagnosis from their symptoms, which can often be misleading.¹³ As our survey found, only 20% of patients accessed the departmental Web sites, with their reasons for visiting being to find the phone number, make an appointment, or learn about their doctor. Only 3.5% of patients

reported visiting the department Web site to learn about their diagnosis. Again, providing direct links to high-quality Web sites in a physician profile or providing information directly on the physician Web site may be a means by which patients help to curtail misleading information available to patients on other Web sites. In addition, guiding patients on their specific diagnosis and means of performing further research, such as instructing them on how to research carpal tunnel syndrome on ASSH, may optimize search results toward more instructional Web sites.

Weaknesses of this study include the subjectivity of physician diagnosis used for study inclusion and the potential of these findings only being relevant to patients with the diagnoses studied. However, we included patients with a broad array of conditions ranging from fractures, compressive neuropathy, tendinopathy, and osteoarthritis. In addition, the study's findings may not be generalizable outside of the hand surgery practices included in this study. However, the study was performed at 2 institutions each with practice locations in both city and suburban settings, creating additional patient diversity, and the use of 2 institutions did attempt to broaden the patient base. This patient population may be unrepresentative of the population as a whole, as patients in this study were seen at academic institutions. In addition, in this survey-based preliminary study, our goal was to identify the frequency of Internet usage, which Web sites are used, and how patients prefer to receive information. Therefore, patients were not given a "free response" study, which did not allow us to gain information such as why patients did not use the Internet, how patients arrived at a diagnosis, why they chose certain Web sites, or what information they found useful or lacking. This also limited our ability to perform any subgroup analyses for further delineation of patient preferences as the number of hits per group would not lead to meaningful analyses. Last, given that we did not conduct an a priori power analysis, we did not attempt any comparative statistical analysis to determine characteristics that are predictive of patient preferences and anticipated utilization of Internet resources (age, education level, traumatic vs non-traumatic condition, specific diagnosis); this is an area for additional study.

Another area of interest for future investigations is our finding that one-quarter of patients indicated that they would not use the Internet to learn about their diagnosis. A greater understanding on this decision would be helpful in designing alternative ways to educate and engage patients. This may include having pamphlets of common diagnoses available in clinic for patients to read, sending them direct links to quality Web sites specific to their diagnosis, or including this information on the physicians' Web site. Last, prospective studies can be designed to evaluate several factors: the consistency of patients' stated versus actual Internet utilization after seeing the hand surgeon, the stated/

actual differences in utilization depending on whether or not surgery is recommended at the office visit, and the effectiveness of providers directing patients to high-quality Internet resources.

Ethical Approval

This study was approved by our institutional review board.

Statement of Human and Animal Rights

All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2008 (5). Informed consent was obtained from all patients for being included in the study.

Statement of Informed Consent

This study was reviewed by the Institutional Review Board at each institution, and informed consent was obtained from all individual participants included in the study as deemed necessary.

Declaration of Conflicting Interests

The author(s) declared the following potential conflicts of interest with respect to the research, authorship, and/or publication of this article: AJR, CJD, and RWW declare that there is no conflict of interest. MSC has received intellectual property royalties from Integra. CAG has the following conflicts of interest: paid consultant for Arthrex, publishing royalties for Wolters Kluwer Health, and board or committee member for American Orthopaedic Association and American Society for Surgery of the Hand.

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