■ B R I E F   R E P O R T ■

Patient Experiences With MedlinePlus.gov: A Survey of Internal Medicine Patients

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■ ABSTRACT

Background: In 2004, the American College of Physicians joined with the National Library of Medicine in an effort to help patients find reliable health information free of commercial bias at the Web site *MedlinePlus.gov*. The aim of this study was to evaluate the usefulness of the *MedlinePlus.gov* site as perceived by patients who were referred to the site by their internist.

Materials and Methods: A 27-item questionnaire developed by the American College of Physicians Foundation was distributed between January and May 2005 to a convenience sample of 893 adult patient volunteers attending 34 internal medicine practices across the United States.

Results: The questionnaire revealed that although most patients (55%) routinely look up medical information, only 43% had used *MedlinePlus.gov*. Of those who had used the site, 95% were satisfied with the information they found there, and 94% said the information they found at *MedlinePlus.gov* would help them make better health decisions.

Discussion: Patients who used the *MedlinePlus.gov* site at the recommendation of their physician found it easy to use, informative, and felt it would help them make better health decisions. Directing patients to this high quality, noncommercial, educational resource online may be an important adjunct to patient education efforts by physicians.

Key Words: internet, internet access, computers, patient education

■ INTRODUCTION

The use of the Internet by patients to access health information continues to increase at a rapid pace. In 2007, 213 million adults (71%) in the United States used the Internet, an increase from 126 million in 2003.[1,2] Of those who used the Internet, 8 in 10 had previously investigated some health-related issue online with a current average of 55.3 million users per month to health information sites.[3] Patients claim a preference of health Web sites with a *.gov*, *.edu* or *.org* address,[4] yet research has shown that, in practice, patients do not routinely check the source or date of the information they find online.[5,6] A study of the most visited health-related Web sites revealed that sites ending with *.gov* constitute only 18% of the market, whereas most of the remaining sites are commercial in nature with WebMD being the leader, garnering 31% of the market.[7] In an effort to give the general public a noncommercial educational option, the *MedlinePlus.gov* site was established in 1998 by the US National Library of Medicine to provide "extensive information from the National Institutes of Health and other trusted sources on over 740 diseases and conditions."[8]

It has been shown that the less health literacy patients have regarding their diseases, the poorer their health outcomes and the less likely they are to use preventive services.[9–12] Despite efforts by physicians to educate their patients about their conditions, time and economic constraints of most medical practices make in depth teaching impossible. The evolution of the Internet as a means to gather and disseminate information makes it an attractive alternative educational tool to supplement the physician-patient interaction. In an attempt to help internists of the American College of Physicians (ACP) direct their patients to these valuable resources online, the ACP partnered with the National Library of Medicine in 2004 to endorse and refer patients specifically to the *MedlinePlus.gov* site through a program called Information Rx. Physicians gave their patients a list of their diagnoses on a special Information Rx prescription pad (Fig. 1) which included the web address of *MedlinePlus.gov* where the patients were to look up and read articles related to their conditions. This report describes the results of a survey of patients across the United States who received Information Rx "prescriptions" from their physicians.

■ MATERIALS AND METHODS

The ACP Foundation sent invitations by e-mail to its members in 2004 asking them to participate in the previously described Information Rx program. Subsequently, all ACP members who showed interest at

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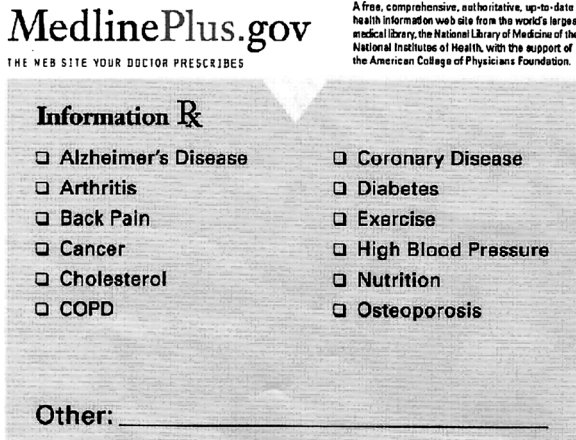
FIGURE 1. Information Rx prescription pad.

34 sites from across the United States distributed Information Rx questionnaires to convenience samples of patients attending their practices. The questionnaire consisted of 27 items which were a combination of Likert type questions (strongly agree, agree, neither agree nor disagree, disagree, and strongly disagree creating a 5-point scale), yes/no questions, and some multiple choice/write-in questions. The patients were encouraged to use the *MedlinePlus.gov* site for a period and then submit the questionnaire either online or by mail. Participants were sent a $15 check from the ACP Foundation after completing the survey online through a specified Web site unrelated to *MedlinePlus.gov* or $10 for mailed questionnaires.

Questionnaire results were compiled and analyzed using Microsoft Excel without the use of personal identifying information. Participating physician practices were grouped into 4 geographical regions for comparison. Patient responses to questions regarding the use and opinion of the *MedlinePlus.gov* site were only analyzed if the patient responded positively to question #10 "Have you ever used the *MedlinePlus.gov* site?"

■ RESULTS

The study population consisted of 893 patients who responded to the questionnaire (828 online, 65 by mail). The exact number of questionnaires distributed by the physicians was not tracked by the ACP Foundation. Table 1 summarizes the results of the questionnaire for the entire USA with results broken down by region. There was remarkable consistency in percentages of similar responses across the regions. Sixty-seven percent of the patients reported a chronic medical condition, with hyperlipidemia, hypertension, and arthritis being mentioned most frequently. Over half of the patients (55%) claimed to look up medical information routinely, with 74% reporting it as "easy to find assistance to look up medical information." Most patients (78%) reported using a computer at home (as opposed to at work or elsewhere), with 44% of the patients spending up to 1 hour online and 36% spending 2 to 4 hours online daily. Most patients (74%) claimed to discuss the medical

TABLE 1. Information Rx Questionnaire

Sample Questions	Positive Responses (USA/Regions)				
	USA n (%)	NE n (%)	SE n (%)	MW n (%)	West n (%)
Patient routinely looks up medical information	487 (55)	50 (48)	161 (56)	120 (54)	156 (56)
Location of computer use					
Home	697 (78)	83 (79)	227 (79)	176 (79)	211 (76)
Office	108 (12)	7 (7)	31 (11)	26 (12)	44 (16)
Hours spent online daily					
0–1	384 (44)	58 (58)	119 (42)	93 (42)	114 (41)
2–4	320 (36)	24 (24)	110 (38)	84 (39)	102 (37)
Discusses search information with physician	657 (74)	77 (74)	204 (71)	160 (71)	216 (79)
High quality source of health information helps me talk to my physician	791 (89)	92 (89)	256 (89)	195 (88)	248 (90)
Patient is quick to respond to physician's recommendations	654 (74)	70 (67)	208 (72)	166 (75)	210 (76)
Percentage who used *MedlinePlus.gov*	376 (43)	45 (44)	125 (43)	92 (42)	114 (42)
Of those who used *MedlinePlus.gov*:					
Found out about the site from their physician	272 (73)	32 (71)	94 (75)	64 (70)	82 (73)
Felt physician adequately informed them about how to access site	341 (91)	40 (89)	116 (93)	80 (89)	105 (93)
Information at the site was easy to understand	344 (91)	41 (91)	115 (92)	82 (89)	106 (93)
Satisfied with information at the site	357 (95)	41 (91)	123 (98)	86 (93)	107 (95)
Trusted site because their physician prescribed it	324 (86)	37 (82)	110 (89)	76 (84)	101 (89)
Felt *MedlinePlus.gov* would help them make better health decisions	351 (94)	42 (93)	119 (95)	83 (90)	107 (94)
Would use *MedlinePlus.gov* again	356 (95)	40 (89)	121 (97)	86 (93)	109 (95)
Would recommend site	344 (91)	42 (93)	117 (94)	80 (87)	105 (92)

Responses of "strongly agree" or "agree" were counted as positive. (Denominator varied based on total responses to each question).

information they encounter with their physician. Eighty-nine percent agreed that a "high-quality source of health information" would assist them in finding medical information to discuss with their physician. Seventy-four percent of patients characterized themselves as fast to respond to their physician's recommendations.

Of the study patients, 43% stated they had used *MedlinePlus.gov* before submitting the questionnaire, and of those who used it, 91% felt that they were adequately informed by their physician on how to access the site. Most (91%) of these patients found the information on *MedlinePlus.gov* easy to understand, and a similar percentage (95%) was satisfied with the information they found there. Eighty-six percent of patients claimed that they trusted the information on *MedlinePlus.gov* because their physician had "prescribed" it, and 94% felt it would help them make better health decisions. Ninety-five percent of study patients claimed they would use *MedlinePlus.gov* again, and 91% were likely to recommend it to others.

Among patients who did not use *MedlinePlus.gov*, the most cited reasons for not doing so was lack of internet access, lack of knowledge of the site, and lack of time.

■ DISCUSSION

The increasing availability of health and medical information on the Internet has allowed patients to become more self-educated about their conditions and medical concerns. This newfound autonomy has the potential to facilitate productive conversation between patients and their physicians where physicians can clarify issues and answer questions related to the information encountered online by patients. The Internet is also a valuable source of health information that physicians can use to help educate patients about their health conditions. It is important for patients to look for health information from reliable sources because a wide variation in content quality and commercial bias exists among available sites.[13] It has been shown, however, that most patients searching for health information begin at a search engine and do not verify the source or date of the information they encounter.[5,6] In fact, the US Department of Health and Human Services reported that it is difficult for patients to determine the validity of many health Web sites given that there is no convention regarding the disclosure of funding sources, authorship, editorial oversight, or dating of information found on these Web sites.[14,15] An encouraging point is that in 1 study, patients expressed a preference for a *.gov .edu* or *.org* Web site address when choosing a health Internet site because this would, at least in theory, direct them to more reliable sources.[4] Other studies have shown that patients find it helpful

for their physician to recommend a preferred site regarding their health issues.[16,17] This was corroborated in the present study, as the large majority of patients using *Medlineplus.gov* trusted the site because it was recommended by their physician.

The current survey showed that patients who used *MedlinePlus.gov* at the recommendation of their physician found the information easy to understand, trustworthy, and applicable to their respective health conditions. Most of the surveyed patients claimed that they would return to the site and would recommend the site to others. The participants almost universally responded that the information found on *MedlinePlus.gov* would assist them in making better health decisions. These favorable responses suggest that the Information Rx prescription program may be a promising supplementary tool for internists to use in promoting patient education in a relatively efficient format.

There are a number of important limitations to this qualitative pilot study. Most importantly, the initial design of the Information Rx program by the ACP Foundation was to evaluate the level of interest in such a program among internists and patients rather than to perform a rigorous research project. One author (R.D.S.) participated in the study as a participating physician in the program but had no input regarding the design of the study. Detailed demographic data regarding the participating practices and patients were not gathered by the ACP Foundation and hence were not available to the authors which limit the ability to generalize the current findings to other groups. Although previous studies have shown that patients with lower education levels, lower socio-economic status, and those older than 65 years have lower rates of Internet use and computer access compared with other groups, the lack of demographic data in this study precluded such comparisons.[18,19] Another limitation includes the fact that no health outcomes were measured nor were accurate estimates of time spent on *MedlinePlus.gov* recorded. Therefore, no firm conclusion can be drawn regarding the actual impact of a patient's exposure to the *MedlinePlus.gov* site. A final important limitation is the lack of comparison of the patient's experience with *MedlinePlus.gov* to other health-related sites.

Some important potential biases existed in this study as well. First of all, the 34 study sites were selected based on volunteer responses of ACP members across the country who might have been more interested in the use of computers for patient education. Second, the participants were made up of a convenience sample of patients who voluntarily completed the questionnaires for which they received a token monetary reward. This may have resulted in a more positive response to the study in general.

In summary, the Information Rx program shows promise in helping physicians direct their patients to a high

quality, noncommercial, educational resource online: *MedlinePlus.gov*. As Internet use continues to increase, further research is needed to identify which patients are most likely to take advantage of the information available at the *MedlinePlus.gov* site and how best to motivate these patients to become active participants in the their own care by accessing this valuable resource. Because studies have revealed a positive correlation between health literacy and improved health outcomes, and the current study has significant limitations, further quantitative research is needed to determine the efficacy of physician-recommended health education using the Internet.

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