BRIEF REPORT

What Do Academic Primary Care Physicians Want in an Electronic Journal?

Dario M. Torre, MD, MPH, Scott M. Wright, MD, Renée F. Wilson, MS,
Marie Diener-West, PhD, Eric B. Bass, MD, MPH

To determine the interest of academic general internists and family physicians in specific features of electronic journal publications, we surveyed 350 physicians, 175 randomly selected from each of 2 medical societies: the Society of General Internal Medicine, and the Society of Teachers of Family Medicine. The response rate was 70%. Most general internists and family physicians used online journals sometimes or often. Most general internists and family physicians reported moderate to high interest in having links from original articles, reviews, or editorials to listed references (77% to 89% of internists and 65% to 81% of family physicians) and electronic medical reference texts (73% to 78% of internists and 65% to 83% of family physicians). Less than 25% of both groups reported moderate to high interest in having links to initiate dialog with other readers or to communicate comments to the author or editor. General internists were more likely than were family physicians to have moderate to high interest in having links to appendices and supportive material (e.g., 66% of general internists versus 46% of family physicians for original articles; $P < .05$) and less likely to have moderate to high interest in links to health-related web sites (44% of general internists versus 69% of family physicians for original articles; $P < .05$). We conclude that academic general internists and family physicians have strong but not identical interests in specific features of electronic publication that primary care-oriented journals should consider.

KEY WORDS: electronic journals; primary care physicians.
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With the advent of the electronic information age, online journals have grown tremendously. They offer a variety of special electronic features that are intended to enhance the usefulness and availability of their content.¹⁻⁵ Previous research indicated that physicians are very

interested in the unique opportunities that electronic journals can offer, such as the ability to establish links with other resources.⁶ However, physicians' interest in specific features of electronic publication may depend on the nature of their work. Academic primary care physicians, in particular, may have unique expectations for general medical journals because of their diverse roles in clinical, teaching, and research activities. In addition, academic primary care physicians could help to guide the development of new electronic features in general medical journals because of the roles they have as authors, reviewers, editors, and members of the organizations that sponsor general medical journals. Thus, it is important for academic primary care physicians to be aware of their colleagues' interests in electronic journal features.

This study sought to assess and compare the interests of academic internists and family physicians in potential electronic features of medical journals and to identify barriers that may prevent physicians from using these electronic features.

METHODS

Study Design

We conducted a cross-sectional survey of academically oriented general internists and family physicians that was initiated in December 2000 and completed in March 2001.

Study Population

We surveyed a total of 350 physicians, with 175 randomly selected from each of 2 medical societies: the Society of General Internal Medicine (SGIM), and the Society of Teachers of Family Medicine (STFM). We targeted members of SGIM because it is dedicated to serving the interests of academic general internists in clinical care, teaching, and research. We targeted STFM because it is the organization of family physicians that is most similar to SGIM in focusing on academic issues.^{7,8} We asked the membership coordinator of each society to randomly select from the membership list 175 individuals who were active members, currently practicing in the United States, and graduates of U.S. medical schools.

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Address correspondence and reprint requests to Dr. Bass: 1830 E. Monument St., Suite 8068, Baltimore, MD 21205-2223 (e-mail: ebass@jhmi.edu).

Survey Instrument

The survey instrument was developed and piloted among primary care physicians at the Johns Hopkins University School of Medicine. The instrument included questions about the respondent's use of online journals and the level of interest in the following electronic features: links to article references, links to health-related web sites (e.g., Medscape or WebMD) or an electronic medical reference (e.g., *UpToDate* or *Scientific American*), links to appendices and supportive material, links to peer reviewers' comments, and links to communicate with the editor, author or other readers. The questions assessing interest in electronic features used a 4-point Likert scale consisting of "no interest," "little interest," "moderate interest," and "high interest." We asked about interest in these features of electronic publications separately for original, review, and editorial articles because we hypothesized that readers' interest in electronic features might vary with the type of article. The survey also included questions regarding interest in receiving customized alerts and an advanced table of contents, and queries regarding potential barriers to use of the online version of a journal. We also collected information about age at graduation from medical school, specialty type, faculty appointment, primary work activity, computer proficiency, and availability of Internet access.

We mailed questionnaires to the selected physicians with a cover letter explaining the purpose of the study. The study protocol was approved by the Johns Hopkins University Joint Committee on Clinical Investigation.

Data Analysis

Descriptive statistics were used to summarize characteristics of responding physicians and their survey responses. To assess for differences between groups we used the Wilcoxon Rank-Sum test⁹ of identical distributions. We also used the χ^2 test to relate computer proficiency to online journal use and barriers. All analyses were performed using STATA Statistical Software, version 6 (Stata Corp., College Station, Tex).

RESULTS

The response rate was 72% (128 of 175 members) for the SGIM group and 70% (122 of 175 members) for the STFM group.

Characteristics of the Respondents

The characteristics of respondents are shown in Table 1. General internists were less likely than were family physicians to report that their primary work activity was teaching and more likely to report research as their main activity. Both groups reported a high level of computer proficiency and Internet access, but respondents were more likely to report that they had never used an online journal if their computer proficiency was poor or fair

Table 1. Characteristic of Survey Respondents

	SGIM (N = 128) n (%)	STFM (N = 122) n (%)
Male	81 (63)	75 (62)
Graduated after 1983	46 (53)	55 (51)
Use of online journals (sometimes or often)	67 (52)	66 (57)
Primary work activity		
Patient care	59 (46)	62 (51)
Teaching	44 (34)*	59 (48)
Research	39 (30)*	4 (3)
Administration	30 (23)	21 (17)
Faculty appointment (part-time or full-time)	115 (89)	104 (88)
Regularly read in medical journals (often or always)		
Original	70 (55)*	46 (37)
Review	73 (57)	66 (55)
Editorials	62 (51)*	26 (22)
Computer proficiency (rated good or excellent)	100 (78)	88 (72)
Internet access		
Home	117 (91)	112 (92)
Work	122 (95)	113 (93)

* *P* value < .05 for the difference between SGIM members and STFM members (by Wilcoxon Rank-Sum test).

SGIM, Society of General Internal Medicine; STFM, Society of Teachers of Family Medicine.

compared to good or excellent (73% versus 26% for internists; 68% versus 31% for family physicians; *P* < .05).

The characteristics of respondents were similar to known characteristics of the SGIM and STFM memberships. According to an SGIM membership survey in 2000, 60% of active members were men, the majority had a faculty appointment, and their primary work activity consisted of a combination of clinical (37%), teaching (21%), and research (22%) activities. (SGIM Membership Survey results, 2000, K. Phelps, written communication, October 2001). Similarly, a report from STFM showed that 58% of members were men, 35% were primarily involved in direct patient care, 26% in teaching, and 16% in administration, and more than half had a faculty appointment in a medical school (STFM Membership Report, 1996, R. Sherwood, MD, written communication, May 2001).

Interest in Specific Electronic Features

As shown in Table 2, general internists and family physicians reported moderate to high interest in having links to an electronic medical reference and to an article's list of references, and low interest in having links to initiate dialog with other readers or to communicate comments to the author or editor. General internists, however, were more interested than were their family practice counterparts in links to appendices and supportive material and less interested in links to health-related web sites, for both original and review articles. General internists also reported slightly more interest than did family physicians

Table 2. Interest in Electronic Features for Original, Review and Editorial Articles by Society

Moderate/high Interest in Having an Electronic Link to	SGIM (N = 128) n (%)	STFM (N = 122) n (%)
Original articles		
Electronic medical reference	101 (78)	95 (80)
Health-related web site	57 (44)*	82 (69)
Article's list of references	115 (89)	96 (81)
Peer reviewers' comments	75 (60)	67 (56)
Forward an article to a colleague	70 (53)	75 (63)
Appendices and supportive material	85 (66)*	55 (46)
Communicate comments to author or editor	43 (32)	42 (35)
Initiate dialog with other readers	20 (15)*	23 (20)
Review articles		
Electronic medical reference	92 (73)	99 (83)
Health-related web site	65 (50)*	82 (71)
Article's list of references	107 (83)	95 (80)
Forward an article to a colleague	62 (48)	68 (57)
Peer reviewers' comments	54 (42)	63 (53)
Appendices and supportive material	74 (57)*	55 (46)
Communicate comments to author or editor	34 (26)	39 (33)
Initiate dialog with other readers	23 (18)	26 (21)
Editorials		
Article's list of references	99 (77)*	77 (65)
Forward an article to a colleague	58 (45)	55 (46)
Communicate comments to author or editor	53 (41)	62 (52)
Initiate dialog with other readers	25 (19)	28 (28)
Other		
Advanced table of content	71 (54)	73 (58)
Customized alerts	92 (73)	90 (71)

* P value < .05 for the difference between internists and family physicians SGIM vs STFM (by Wilcoxon Rank-Sum test).
SGIM, Society of General Internal Medicine; STFM, Society of Teachers of Family Medicine.

in links to an article's list of references for original and editorial articles and slightly less interest in links to initiate dialog with other readers for original articles. For all remaining electronic features, general internists and family physicians had a similar degree of interest.

Barriers

General internists and family physicians had similar views about potential barriers to use of electronic journals. Most respondents indicated that Internet access was not a barrier to use of online journals (61% of general internists, 74% of family physicians). Participants also reported that preference for print media (51% of general internists and 52% of family physicians) and inability to read the journal anywhere (53% of general internists and 59% of family physicians) were minor barriers to the use of electronic features.

The inability to read the journal anywhere was considered to be a major barrier by 84% of family physicians with low computer proficiency but only by 16% of family physicians with high computer proficiency ($P < .05$). Similarly, preference for print media was felt to be a major barrier by 75% of internists with low computer proficiency but by only 24% of internists with high computer proficiency ($P < .05$).

DISCUSSION

Our results indicate that academic general internists and family physicians have strong but not identical interests in special features of electronic journals. These results may help to guide the development of electronic journals, especially those that target general internists and family physicians. These results also may prompt academic general internists and family physicians to be proactive in recommending changes in electronic journals that will address their needs. Journals, however, have limited resources and may not be able to offer all of the electronic features that are now possible.

Journals that target both general internists and family physicians should make it a priority to offer those electronic features that are of greatest interest to both groups. Academic general internists and family physicians indicated high interest in links to listed references and electronic medical references. The potential to immediately obtain not only the proper reference for a specific topic but also the text of an article or chapter of interest is a convenient and timesaving feature for teachers and researchers. Previous research has shown that physicians learn in response to specific problems posed by patients.¹⁰ This may explain the interest of both groups in links to an electronic medical reference, a particularly convenient feature for clinically related questions.

Journals that target either internists or family physicians but not both should offer the features of greatest interest to their particular targeted group. Thus the greater interest in links to appendices and supportive material reported by general internists may suggest a desire to have access to methodological details (e.g., survey instruments or educational syllabi) that may be useful in the development of future scholarly work. This may also be an increasingly valuable feature of journals, because many journals are decreasing the amount of space available for each article.

The reported interest in advanced release of table of contents and customized alerts may reflect the need for timely updates on topics for which weekly searches to stay up to date would be difficult to perform. Such services would be particularly useful to academic physicians who want to be on the leading edge in their teaching and research activities.

This survey reported relatively high computer proficiency among academic general internists and family physicians. As expected, a higher level of computer proficiency was associated with a much lower likelihood of reporting barriers to use of electronic journals. As computer proficiency increases among physicians, the use of electronic journals probably will continue to increase.

Although print journals will never be replaced, the electronic version of a journal may offer services simply not possible in the paper version. The ubiquitous access to a variety of medical information, the ability to rapidly print full text articles, and the ability to move easily from a reference of an article to the content of another article are exciting features offered by online publications. Continuing advances in technology ultimately may allow journals to fully customize their contents to the needs and resources of the modern physician.

One limitation of this study is that responders may have been more interested in using online journals than were nonresponders. Responders, however, were repre-

sentative of SGIM and STFM members in terms of gender, faculty appointment, and primary work activity. A second limitation is that respondents may have commented on specific features they have not yet used. However, most of the respondents reported a high degree of computer proficiency and Internet access. Furthermore, job-related activities (e.g., educator versus researcher) might have influenced physician preferences for specific features. It is hard to predict how physicians will respond to advances in the rapidly evolving publishing world and how they will integrate electronic journals with other information resources. Thus, we believe it is important to gather data on what services physicians want journals to provide.

On the basis of the results of this study, we conclude that academic general internists and family physicians have strong interest in some but not all features of electronic publication. Medical journals that target these groups should consider these interests when developing specific features of electronic publication.

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