BRIEF REPORT: Multiprogram Evaluation of Reading Habits of Primary Care Internal Medicine Residents on Ambulatory Rotations

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OBJECTIVE: To assess the reading habits and educational resources of primary care internal medicine residents for their ambulatory medicine education.

DESIGN: Cross-sectional, multiprogram survey of primary care internal medicine residents.

PARTICIPANTS/SETTING: Second- and third-year residents on ambulatory care rotations at 9 primary care medicine programs (124 eligible residents; 71% response rate).

MEASUREMENTS AND MAIN RESULTS: Participants were asked open-ended and 5-point Likert-scaled questions about reading habits: time spent reading, preferred resources, and motivating and inhibiting factors. Participants reported reading medical topics for a mean of 4.3 ± 3.0 SD hours weekly. Online-only sources were the most frequently utilized medical resource (mean Likert response 4.16 ± 0.87). Respondents most commonly cited specific patients' cases (4.38 ± 0.65) and preparation for talks (4.08 ± 0.89) as motivating factors, and family responsibilities (3.99 ± 0.65) and lack of motivation (3.93 ± 0.81) as inhibiting factors.

CONCLUSIONS: To stimulate residents' reading, residency programs should encourage patient- and case-based learning; require teaching assignments; and provide easy access to online curricula.

KEY WORDS: reading habits; ambulatory medicine; graduate medical education; internal medicine residency.

DOI: 10.1111/j.1525-1497.2006.00432.x

J GEN INTERN MED 2006; 21:486-489.

As the availability and amount of rapidly evolving medical information increases, "keeping up" becomes more challenging,^{1,2} especially for primary care physicians, who may spend less time on medical reading than do hospital-based physicians.^{2,3} Studies show a gradual decline in medical knowledge and quality of care after physicians leave the structured environment of residency.⁴⁻⁸ For residents, reading solidifies knowledge acquired from patient care experiences.^{9,10} Effective reading habits may continue beyond residency, and may slow erosion of knowledge and quality of care among practicing physicians.

To our knowledge, no studies have been published on the reading habits and educational resources of primary care internal medicine (PCIM) residents. Our objectives were to assess the amount of time residents spend reading during

ambulatory care rotation and to determine preferred educational resources and the factors that influence reading habits.

METHODS

Subjects

We identified residency programs from the Primary Care Program Directors' Interest Group of the Society of General Internal Medicine and through personal communication. Nine programs from California, Colorado, Massachusetts, Missouri, New York, Pennsylvania, and Virginia agreed to participate. Eligible subjects included 124 second- or third-year PCIM residents on an ambulatory care rotation for at least 7 days without overnight call responsibilities. The study was approved by the principal center's institutional review board and was reviewed by committees at the participating sites.

Procedure

Between January and June 2004, we distributed the surveys to PCIM residents during ambulatory care rotations. Each survey included an addressed envelope and an incentive of \$2.

Survey Instrument

The survey contained no personal identifiers. We reviewed instruments published in past studies,^{11,12} developed and tested questions with selected faculty and ineligible residents, and made revisions to improve clarity and comprehensiveness. In addition to questions about demographic data and career plans, participants were asked questions from 4 domains relating to reading habits while on ambulatory care rotation: (1) time spent on reading in the past week, (2) reading sources commonly used, (3) factors that motivated and inhibited reading about outpatient topics, and (4) curricular strategies to stimulate reading. The first and fourth domains were open-ended questions; the second and third used 5-point Likert scales. To evaluate commonly used sources, we asked, "How frequently do you read each of the following sources for your ambulatory education?" To assess motivating factors, we asked, "How frequently does each of the following factors motivate you to read for your ambulatory education?" To assess inhibiting factors, we asked residents to rate agreement with the following: "The following factor significantly inhibits my reading for ambulatory medicine." For the fourth domain, residents were asked about curricular innovations that could enhance their reading habits. To assess residents' perception of adequacy of time for reading, we asked a "yes/no" question: "Do you feel that you have enough opportunity to read about ambulatory medicine during your primary care rotation?"

The authors have no conflicts of interest to declare.

This work was presented in part as a scientific poster at the 28th Annual SGIM Meeting, New Orleans, May 2005.

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Statistical Analysis

Descriptive statistics and frequency of responses were tabulated and presented as means $\pm$ SD to identify factors that most motivate and inhibit residents' reading. Themes for strategies to promote reading were generated from the most frequent responses.

RESULTS

Sample

Response was 71% (88 of 124 participants). Respondents were 70% women and 54% second-year residents. Sixty-eight percent reported plans for general internal medicine careers, 17% subspecialty, and 15% undecided or other.

Time Spent Reading

Respondents spent a mean of 4.3 ± 3 h/wk reading medical topics, with over two-thirds of this time devoted to ambulatory and the remainder to inpatient topics. One-third of the respondents believed that they lacked time to read medical materials. However, residents reported reading nonmedical materials 4.7 ± 4.1 h/wk. We calculated the absence of linear correlation between medical and nonmedical reading hours.

Reading Sources

Online-only sources (4.16 ± 0.87) and journals (3.43 ± 0.93) were the most commonly identified reading sources (Fig. 1). Of online sources, 98% of residents reported using UpToDate.com[®] regularly, 44% literature search, and 35% Google.com[®] or other search engines. The journals most frequently used were *The New England Journal of Medicine*, *The Journal of the American Medical Association*, *Annals of Internal Medicine*, and *American Family Physician*.

Factors that Motivate and Inhibit Reading

Motivating factors were medical problems of individual patients and preparation for presentations (Fig. 2). Inhibiting factors included family and personal responsibilities and lack of motivation (Fig. 3).

Strategies to Promote Reading

The most frequently suggested strategy to promote reading was to assign resident-led discussions, including management updates and case-based conferences (17 comments). Respondents suggested structured time to read (14 comments) and goal-directed curricula, including syllabi with learning objectives and articles (12 comments).

DISCUSSION

In our survey, we found that PCIM residents on ambulatory care rotations reported spending a mean of 4.3 h/wk on medical reading. Over one-third of respondents reported insufficient time for reading medical topics. Respondents were most motivated to read by specific patients' cases and preparation for talks, and were most inhibited from reading by family responsibilities and lack of motivation.

The time spent reading medical topics in our cohort was similar to that in other cohorts of ambulatory residents. Studies of family practice residents and Australian general practitioner trainees reported a mean reading time of 3.7 and 3.3 h/wk, respectively.^{11,13} In comparison, a small study showed that internal medicine residents on inpatient wards reported an average reading time of 8.7 h/wk.¹² Although conducted before work-hour regulations, its results remain interesting; on-call residents may have had more "down time" to read than residents in busy ambulatory clinics. Also, residents on inpatient rotations are required to teach and may spend more time reading than ambulatory residents who have few formal teaching responsibilities.

FIGURE 1. Frequency of reading sources used for ambulatory medicine.

FIGURE 2. Motivating factors for reading ambulatory medicine. Motivating factors were rated according to the frequency that each motivated residents to read.

Online-only sources were used most often, and UpToDate.com was used by almost all respondents, in a shift from the early 1990s, when textbooks, journals, and pocket manuals were the primary medical resources.¹¹⁻¹⁴ Interestingly, while identified by residents as one strategy to promote reading, syllabi were among the least frequently used educational resources. Given the shift to electronic media, we conclude that syllabi, and other curricula, should be readily available online to be effective.

The lack of motivation reported by residents is noteworthy because most respondents reported plans for general medicine careers and found time for nonmedical reading. This apathy may reflect various factors, including the need for "personal time" after busy inpatient rotations, lack of formal ambulatory

teaching and reading expectations, and the overwhelming breadth of outpatient topics. Residents may feel little motivation or pressure to read because ambulatory preceptors give answers immediately in teaching encounters during or after each patient visit. Furthermore, because residents on ambulatory rotations generally lack formal teaching responsibilities, they may not feel compelled to read, particularly with competing personal and family responsibilities. Finally, the range of outpatient topics may be so broad that residents are overwhelmed, a sentiment reflected by the frequent request for a more structured curriculum or a syllabus.

This study has several limitations. Although we had a good response rate (71%) and included residents from 9 programs, nearly all eligible residents were in academic programs,

FIGURE 3. Inhibiting factors for reading ambulatory medicine. Each inhibiting factor was rated according to the respondents' degree of agreement.

and our results may not be generalizable to nonacademic programs. Primary care programs were selected based on self-identification; the structure of ambulatory rotation experiences, including time left open for reading, varied by institution. Residents may have broadly interpreted "reading" to include a range of activities, from skimming abstracts to reading full chapters. Although it does not fully eliminate potential inaccuracies, we asked residents to differentiate between reading predominantly inpatient and ambulatory medicine. We also included "literature search" as an online source distinct from journal articles, which may have led to categorization confusion, as online searches are frequently conducted to find journal articles, in addition to press releases, medical websites, and product information. Furthermore, although we included an option for write-in responses, the structured answers to the questions on facilitating and inhibiting factors may have missed key features. In addition, our results are based on residents' self-reports of reading times, which may be substantially inflated.¹⁵ Finally, we evaluated only quantity of reading, not quality or efficiency.

Our study shows that residents are most motivated to read by their patients' medical problems and their own teaching responsibilities. Therefore, residency programs should engage residents in active learning by assigning them to lead case-based discussions and didactic talks on ambulatory medicine topics. Because residents are most likely to use online sources when they do read, educators should provide online references, including clear learning objectives and syllabi.

One of the greatest challenges facing PCIM residents is finding time to read and to keep up with medical knowledge. As medical educators, we should design curricula that will stimulate residents to read and develop lifelong learning habits. Further research should evaluate whether reading habits during training predict physicians' reading behavior after residency.

Cornell University, Massachusetts General Hospital, New York University, University of California at San Francisco (UCSF), UCSF-San Francisco General Hospital, University of Colorado, University of Missouri in Kansas City, University of Pennsylvania, and University of Virginia. Specifically, we thank Drs. Brent Beasley, Kevin Fosnocht, Keith Roach, Valerie Stone, Judy Tung, Margaret Wheeler, Sonia Zabar, and Ms. Lorraine Adams. We also thank Dr. Kerry Cho for critical manuscript review and Ms. Clarice Escobar for data collection.

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The authors would like to acknowledge the following PCIM programs and their residents for their participation in this study: