
The Information Needs of Family Physicians: Case-Specific Clinical Questions

John W. Ely, MD; Richard J. Burch; and Daniel C. Vinson, MD, MSPH

Columbia, Missouri

Background. Physicians must be able to rapidly obtain information that answers specific patient-related clinical questions. This study describes the information-seeking process in the office practices of family physicians.

Methods. We observed and recorded the information-seeking and information-obtaining behavior of 30 family physicians in their offices.

Results. Based on 172 hours of observation and 602 patient visits, family physicians sought answers to an average of only one clinical question for every 15 patients seen. Urban physicians sought answers to more questions than rural physicians (one question for every 9 patients, as compared with one question for every 24 patients; $P < .05$). The frequency of seeking information was not related to the physician's

age. Busier physicians (those seeing more patients per hour) tended to ask fewer questions (correlation coefficient (r) = $-.34$, $P = .06$). Drug-prescribing questions were the most common type; second most common were orthopedic questions. Colleagues and the *Physicians' Desk Reference* were the most often used resources. Eight percent of the questions were not answered.

Conclusions. Among family physicians, patient-related questions are infrequently asked and highly specific. Most questions are rapidly answered using colleagues and books, not journals or computers.

Key words. Information systems; physicians, family; consultants; reference books, medical; physician's practice patterns. *J Fam Pract* 1992; 35:265-269.

A challenge for busy physicians is to quickly obtain the clinical information they need. Physicians' information needs can be grouped into three categories¹⁻⁴: (1) the general need to remain current in an area of practice, (2) the need of the physician researcher to complete an exhaustive search of the literature in a specific field, and (3) the need of the physician to obtain answers to well-defined, highly specific questions about individual patients.

The physician looking for quick answers to specific patient-related questions has not benefited from the computerized retrieval systems available to the university-based researcher.^{1,5,6} The researcher might spend months completing an exhaustive literature search, but the clinician must find answers quickly from easily accessible sources relevant to the patient waiting in the office.^{6,7} Such questions may be specific and mundane ("Is the tablet scored?") or more general and complex ("What

combination of factors might explain this patient's syn-copal episode?").

Despite the importance of finding answers to case-specific questions, there has been little investigation of this process.⁷ As an initial step toward facilitating the information-obtaining process, we observed the current practices of family physicians in their offices. We were interested in how often patient-specific questions arise, how the answers are found, and how often such questions go unanswered.

Methods

A convenience sample of 34 board-certified family physicians was selected from rural and urban practices based on geographic accessibility to Columbia, Missouri. Thirty physicians agreed to participate, and a half-day or full-day office-observation period was scheduled. Physicians who practiced in or near a city with a population of over 50,000 were classified as urban; the remaining physicians were considered rural.

We defined a case-specific clinical question as a need by the physician for medical information related to the

Submitted, revised, April 13, 1992.

From the Department of Family and Community Medicine, University of Missouri-Columbia. Requests for reprints should be addressed to John W. Ely, MD, Department of Family Practice, University of Iowa Hospital and Clinics, Steindler Bldg, Iowa City, IA 52242.

care of a specific patient. At the beginning of the session, the observer told the physician, "I need to know if you have any questions related to the care of the patient you are seeing. I need to know what the question is, what the answer is, and the source of the answer." We excluded physicians' questions asking only for patient data ("What was the blood pressure? What was the potassium?"), and we excluded nonmedical questions ("Where do I sign this insurance form?"). We also excluded general questions that were not related to or prompted by a specific patient ("What are the latest recommendations for the treatment of heart failure?").

After the initial explanation, the physicians were not prompted for questions and they were asked not to modify their questioning behavior because of the presence of the observer. The observer was as unobtrusive as possible and usually did not enter the examining room. We focused on information-seeking behavior rather than question-asking behavior. However, questions verbalized by the physician were recorded whether or not an answer was sought. Most of the office observations were made by one of the authors (R.J.B.), a second-year medical student. When a question occurred, the observer recorded the question, the answer, and the resource used to answer the question. The duration of observation and the number of patients seen during the observation period were also recorded. The observations took place from May to November, 1991.

Most of the data were analyzed using descriptive statistics. Factors that might be associated with the frequency of seeking answers were analyzed with correlation coefficients for continuous variables and the Wilcoxon rank-sum test for categorical variables. Significant differences were defined as those associated with a P value less than .05.

Results

The mean age of the 30 participating physicians was 42 years (range, 29 to 66 years), and they had been in practice for an average of 13 years (range, 4 months to 42 years). Sixteen practices were rural and 14 were urban. The total observation time was 172 hours, an average of 5.7 hours per physician. The 30 physicians saw 602 patients and asked a total of 41 questions. An average of one question was asked for every 15 patients seen.

One physician asked many more questions than the others, with an average of slightly more than one question per patient. This physician had completed a residency only 4 months before and was considered an outlier but was initially included in all analyses.

Rural physicians asked fewer questions than urban

Table 1. Characteristics of Rural and Urban Physicians Participating in a Study of How Physicians Seek Answers to Patient-Related Clinical Questions

Variable	Rural (n = 16) Mean	Urban (n = 14) Mean	P Value
Number of patients seen per question prompted	24	9	<.05
Number of patients seen per hour	3.8	3.2	NS
Number of colleagues in practice	1.4	2.6	<.02
Physician age (y)	46	38	<.01
Years in practice	17	9	<.02

NS denotes not significant.

physicians (one question for every 24 patients vs one question for every 9 patients; $P < .05$). The characteristics of rural and urban physicians are listed in Table 1. The frequency of questions was unrelated to physician age (correlation coefficient [r] = $-.24$, $P > .2$), or years in practice ($r = -.23$, $P > .2$). There was a tendency for busier physicians to ask fewer questions; ie, there was an inverse correlation between the number of patients seen per hour and the number of questions prompted per patient. However, the correlation ($r = -.34$) did not reach statistical significance ($P = .06$). Physicians with the most practice colleagues tended to ask more questions ($r = .33$, $P = .08$). Urban physicians had more colleagues than rural physicians.

Questions pertaining to treatment accounted for 30 of the 41 questions, and 11 were related to diagnosis. Twenty questions (49%) were related to pharmacology, 6 to orthopedics, 3 to dermatology, and the remaining 12 were divided among seven other topic areas. Eight of the 20 pharmacology questions were related to drug dosage, 4 to drug side effects, and 3 to drug interactions. For 3 of the 41 questions an answer was sought but not found. For 2 questions an answer was never sought. The remaining 36 questions were answered while the patient waited in the examining room. At the end of the day, we asked each physician whether there were any case-specific questions to which an answer would be sought after office hours. None of the physicians had such questions. Examples of typical questions are shown in Table 2.

Colleagues in the same practice answered 12 of the 41 questions and were the most common resource. Most often the colleague was another family physician. The *Physicians' Desk Reference*⁸ was the next most common resource and was used to answer 11 of the 41 questions. Medical textbooks and drug information texts other than the *Physicians' Desk Reference* (eg, *Drug Facts and Comparisons*⁹) were each used to answer five questions. In one case a journal article was consulted. Computer searches were not used to answer any questions; however, only

Table 2. Examples of Physicians' Case-Related Questions

- What is the dose of alprazolam?
- Is trazodone contraindicated in patients who go to saunas because of the combined effect causing postural hypotension?
- Are there any new treatments for Graves' ophthalmopathy in this patient who has already received radioactive iodine and is concerned about the appearance of her bulging eyes?
- What is the spot in this patient's mouth?
- Can carbamazepine cause albuminuria?
- Are Normodyne and Trandate the same drug?
- Can clonidine cause night sweats?
- What is the starting dose of prednisone in this patient with polymyalgia rheumatica?

four of the 30 physicians had personal computers in their offices.

All analyses were repeated after excluding the outlier, who had asked nine of the 41 total questions. The outlier was an urban physician, and after excluding him, the difference in question frequency between urban and rural physicians was no longer significant (one question for every 14 patients as compared with one question for every 24 patients; $P = .08$). There was no longer a correlation between question frequency and number of practice colleagues ($r = .20$, $P = .3$). The outlier physician had no pharmacology questions and all of his questions were answered by colleagues.

Discussion

Investigators of physicians' case-related questions have used one of three research methods: the written questionnaire,^{1,7,10-13} the critical incident technique,^{11,14-16} or the office observation.¹⁰ The critical incident technique involves asking physicians to describe their most recent questions and the methods used to find the answers. This technique is limited by the physician's memory. Mundane tasks such as checking drug dosages are unlikely to be recalled. The critical incident technique does not allow the determination of question frequency.

Other than our study, only the study by Covell et al¹⁰ used direct physician observation to gather data. Working with internists in Los Angeles, Covell and co-workers found that an average of one question was asked for every 1.5 patients seen, compared with one question for every 15 patients in our study. Although differences between internists and family physicians may account for some of this discrepancy (eg, internists are more likely to use journals whereas family physicians tend to consult colleagues^{2,6,13,17}), several differences in study design probably explain most of the discrepancy.

First, the office observers in the study by Covell et al interviewed the physician after every patient encounter and asked, "Do any questions occur to you . . . regarding

your management of this patient's problem . . . ?"¹⁰ In contrast, we were as unobtrusive as possible, recording only those questions that the physician verbalized or sought an answer to.

Second, the definition of a patient-related question in the study by Covell and colleagues was broader than ours. We excluded nonmedical questions and those questions simply asking for laboratory results. Covell et al included these questions.

Finally, Covell et al studied only urban physicians. The frequency of information-seeking questions among the urban physicians in our study (one question for every nine patients seen) is closer to their rate than the rate among all participants in our study.

Question frequency is markedly higher in academic settings. For example, Osheroff et al¹⁸ studied a university internal medicine service and found that when a team of medical students, residents, and attending physicians made hospital rounds, an average of five questions were asked in connection with every patient discussed.¹⁸ Seventy-four percent of these questions were motivated by patient care; 22% were asked for educational purposes.

We found that rural family physicians ask fewer questions than urban family physicians. However, this finding must be interpreted cautiously for several reasons. The sample size was small and not randomly selected from the population. When the outlier physician was excluded, the difference was no longer significant. Finally, other variables may have confounded the relationship. For example, urban physicians had more practice colleagues than rural physicians, and physicians with more colleagues tended to ask more questions.

Previous studies have not explored the frequency of information seeking in relation to physician age or practice location (urban vs rural). However, when studying general information needs, several investigators found that older physicians tend to rely on pharmaceutical representatives and continuing medical education courses, whereas younger physicians more often consult textbooks, journal articles, and colleagues.^{2,17,19-21} Moore-West and colleagues¹⁶ found that both rural and urban physicians cite patient care as the most frequent reason for obtaining information, but urban physicians were more likely to indicate other reasons, such as curiosity and research. Exploration of other factors, such as patient characteristics and physician intolerance of ambiguity,²² may help explain variations in question frequency.

In our study, colleagues were the most often used resource. Others have found a similar reliance on colleagues to answer patient-specific questions.^{10-12,19} In the study by Covell et al,¹⁰ physicians indicated on a questionnaire that they used printed sources (textbooks,

journals, drug information sources) most often. However, when observed in daily practice, the source most often consulted was another physician.

In our study, the *Physicians' Desk Reference* was the second most common resource. Connelly et al¹ found that when only printed material was considered, the *Physicians' Desk Reference* was the most frequently used resource.

Computer searches were not used to answer any questions in our study. Although advocated by some authors,^{18,23,24} computers have not proved useful to clinicians with case-related questions.^{1,6,20,25-27} The major obstacle appears to be the time required to obtain relevant information.^{23,26,27}

According to a model developed by Curley et al,⁷ the resource most likely to be used will be physically close, easy to use, easy to understand, clinically applicable, and inexpensive. In a survey of internists and family physicians, availability and applicability were the most influential factors.⁷ Ideally, the resource also should be authoritative and comprehensive. But in practice, convenience factors outweigh quality factors.^{1,11,15,19,28-30}

Our findings are limited by the small number of questions generated in spite of many hours of physician observation. Based on the study by Covell and colleagues, we anticipated several hundred questions. But we believe our data accurately reflect how often family physicians seek answers to patient-specific questions. Covell et al were interested in every question that occurred to the physician, whereas we were more interested in the actual frequency of answer-seeking behavior. The physicians in our study probably had questions that were never verbalized. They may have sought answers privately during the observation period or afterward. The physicians seemed to understand the objectives of our study, however, and they appeared to be open and honest when a question occurred.

Exclusion of the outlier physician altered some of our findings. We included him in the initial analysis because he may represent an information-seeking pattern typical of other physicians in their first few months of practice.

Other limitations of our study include the sampling method and the potential effects of observation. We made no attempt to select a random sample of physicians because the eventual participants would still consist of a select group of those willing to participate. There were only 30 participants, and all but one were men. The extent to which our findings can be generalized to a larger group of family physicians is unknown. However, both rural and urban physicians were represented, and there was a wide age range (29 to 66 years).

We conclude that family physicians seek answers to

an average of one to two patient-specific questions per day. In our study, most of the questions were drug related, and all answers were obtained while the patient waited in the examination room. Although most questions were quickly answered with readily available resources, answers to several questions were not found or even pursued. Comparing our data with that of Covell et al,¹⁰ we suspect that many questions were never verbalized nor answers sought owing to the perceived difficulty of finding answers. Although difficult to study, this area may be an important one to investigate further. We believe it is important to encourage practicing physicians to ask more questions and to facilitate the process of finding answers.

Acknowledgment

This study was supported by a grant from DHHS, National Research Service Award.

References

1. Connelly DP, Rich EC, Curley SP, Kelly JT. Knowledge resource preferences of family physicians. *J Fam Pract* 1990; 30:353-9.
2. Gruppen LD. Physician information seeking: improving relevance through research. *Bull Med Libr Assoc* 1990; 78:165-72.
3. Menzel H. Scientific communication: five themes from social science research. *Am Psychologist* 1966; 21:999-1004.
4. Burroughs CM. Clinicians' satisfaction with GRATEFUL MED: an exploratory study. *Bull Med Libr Assoc* 1989; 77:56-60.
5. Menzel H. Sociological perspectives on the information-gathering practices of the scientific investigator and the medical practitioner. In: McCord D, ed. *Bibliotheca medica: physician for tomorrow*. Boston: Harvard Medical School, 1966:112-30.
6. Williamson JW, German PS, Weiss R, Skinner EA, Bowes F. Health science information management and continuing education of physicians. A survey of US primary care practitioners and their opinion leaders. *Ann Intern Med* 1989; 110:151-60.
7. Curley SP, Connelly DP, Rich EC. Physicians' use of medical knowledge resources: preliminary theoretical framework and findings. *Med Decis Making* 1990; 10:231-41.
8. *Physicians' desk reference*. 45th ed. Oradell, NJ: Medical Economics Company, 1991.
9. *Drug facts and comparisons*. St Louis: Facts and Comparisons, 1991.
10. Covell DG, Uman GC, Manning PR. Information needs in office practice: are they being met? *Ann Intern Med* 1985; 103:596-9.
11. Timpka T, Ekstrom M, Bjurulf P. Information needs and information seeking behaviour in primary health care. *Scand J Prim Health Care* 1989; 7:105-9.
12. Gruppen LD, Wolf FM, Van Voorhees C, Stross JK. The influence of general and case-related experience on primary care treatment decision making. *Arch Intern Med* 1988; 148:2657-63.
13. Gruppen LD, Wolf FM, Van Voorhees C, Stross JK. Information-seeking strategies and differences among primary care physicians. *Mobius* 1987; 7:18-26.
14. Flanagan JC. The critical incident technique. *Psychol Bull* 1954; 51:327-58.
15. Northup DE, Moore-West M, Skipper B, Teaf SR. Characteristics of clinical information-searching: investigation using critical incident technique. *J Med Educ* 1983; 58:873-81.
16. Moore-West M, Northup D, Skipper B, Teaf D. Information-

- seeking behavior among physicians practicing in urban and nonurban areas. *Proc Annu Conf Res Med Educ* 1984; 23:237-42.
17. Stross JK, Harlan WR. The impact of mandatory continuing medical education. *JAMA* 1978; 239:2663-6.
 18. Osheroff JA, Forsythe DE, Buchanan BG, Bankowitz RA, Blumenfeld BH, Miller RA. Physicians' information needs: analysis of questions posed during clinical teaching. *Ann Intern Med* 1991; 114:576-81.
 19. Stinson ER, Mueller DA. Survey of health professionals' information habits and needs. *JAMA* 1980; 243:140-3.
 20. Strasser TC. The information needs of practicing physicians in northeastern New York State. *Bull Med Libr Assoc* 1978; 66:200-9.
 21. Murray-Lyon N. Communication in medicine: a study of how family doctors obtain information on recent advances in the treatment of rheumatic disease. *Med Educ* 1977; 11:95-102.
 22. Budner S. Intolerance of ambiguity as a personality variable. *J Pers* 1962; 30:29-50.
 23. Haynes RB, McKibbon KA, Fitzgerald D, Guyatt GH, Walker CJ, Sackett DL. How to keep up with the medical literature: IV. Using the literature to solve clinical problems. *Ann Intern Med* 1986; 105:636-40.
 24. Yasnoff WA. Electronic information. Part II. *Wis Med J* 1989; 88:31,35.
 25. Greenberg B, Breedlove B, Berger W. MEDLINE demand profiles: an analysis of requests for clinical and research information. *Bull Med Libr Assoc* 1977; 65:22-30.
 26. Collen MF, Flagle CD. Full-text medical literature retrieval by computer: a pilot test. *JAMA* 1985; 254:2768-74.
 27. Marshall JG. The physician in the information age: interim results of the CMA iNet trial. *Can Med Assoc J* 1985; 133:1046-8.
 28. Lancaster FW. Effect of physical accessibility and ease of use. In: The measurement and evaluation of library services. Washington, DC: Information Resources Press, 1977:312-21.
 29. Lancaster FW, Smith LC. Science, scholarship and the communication of knowledge. *Libr Trends* 1979; 27:367-88.
 30. Zipf GK. Human behavior and the principle of least effort: an introduction to human ecology. Cambridge, Mass: Addison-Wesley, 1949.

Call for Papers

THE SOCIETY OF TEACHERS OF FAMILY MEDICINE

26th Annual Spring Conference

May 1-5, 1993

Hyatt Regency in Embarcadero Center
San Francisco

Categories for submission include research forums, research fair, lecture-discussions, seminars, workshops, peer sessions, theme days, special topic breakfasts, and special sessions.

Submissions must be received by October 15, 1992. For further information contact:

The Society of Teachers of Family Medicine
8880 Ward Parkway, PO Box 8729
Kansas City, MO 64114
800-274-2237 or 816-333-9700