

# Answering Clinical Questions

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**BACKGROUND.** Physicians often have unanswered clinical questions. The purpose of this study was to determine how often the answers to these questions can be found in the medical literature.

**METHODS.** We collected unanswered clinical questions from family physicians at the end of clinical half-days. The authors and medical librarians then used textbooks and MEDLINE to find answers to each question. We returned to the physicians one to five selected references for each question. Each physician rated these sources on how well they answered the questions and how they might influence the physician's practice.

**RESULTS.** One hundred three questions were gathered. Physicians asked an average of 0.5 questions per half-day. We searched for answers to 86 questions, and the physicians returned ratings for 84. Forty-five (54%) of these questions were fully or nearly fully answered by the materials returned to the physicians. Of the questions for which answers were found, MEDLINE searches accounted for 71%; textbooks, 20%; and a combination, 9%. MEDLINE searches took an average of 27 minutes, whereas textbook searches averaged 6 minutes.

**CONCLUSIONS.** The medical literature can provide answers to a majority of clinical questions; however, finding these answers is time-consuming and expensive. Physicians need more efficient ways to answer their clinical questions.

**KEY WORDS.** Information systems; information services; MEDLINE; physicians, family; decision making, computer-assisted. (*J Fam Pract* 1996; 43:140-144)

Family physicians encounter a wide spectrum of illnesses and patient problems. When a physician is unsure of how best to deal with these encounters, clinical questions arise. Previous studies have found that these questions occur frequently and that the majority are never answered.<sup>1,2</sup> Physicians may believe that the answers to their questions do not exist or that searching for them is too time-consuming, difficult, or expensive.

We conducted a study to examine physicians' clinical questions. Our primary research question was: How frequently can MEDLINE and standard medical textbook searches answer family physi-

cians' clinical questions? Secondary research questions addressed were how frequently questions occur, what prompts the questions, how urgently the answers are needed, and which is more valuable as a resource for clinical questions, MEDLINE or textbooks.

## METHODS

The study sample consisted of family practice physicians in Columbia, Missouri, who spent more than 75% of their professional time in patient care activities. Of the 11 eligible physicians, we invited the 10 who worked in group practices to participate in the study. Nine of the physicians (five women, four men) agreed to participate. The mean interval since medical school graduation among this group of physicians was 10 years, with a range of 4 to 19 years.

We initially interviewed each participant at the end of every half-day in clinic to ask if he or she had any unanswered clinical questions. We did not record questions for which the physician had already obtained a satisfactory answer. After per-

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sonally interviewing the physicians several times, we asked them to call a voice-mail system and dictate questions at the end of each clinic half-day. Reminder stickers were placed on the physicians' patient schedules. We continued to personally visit each physician intermittently several half-days per week. The questions were collected from February through July 1995.

We recorded each question, its urgency, and the reason for asking it. We categorized the questions by subject (eg, internal medicine, pediatrics) and type (eg, treatment, diagnosis). When necessary, we edited questions for clarity and brevity.

We selected questions to be searched based on the availability of the librarians' time. Whenever possible, we researched all questions. Occasionally, when there were too many questions in any single question-collection period, we selected every other one. We sent them to two medical librarians, who searched MEDLINE for relevant articles. Both librarians were employed by the department of family medicine at the University of Missouri-Columbia. One had 12 years' and the other 3 years' experience in conducting MEDLINE searches. The librarians could ask us to clarify questions but could not communicate with the study participants. The librarians selected the four citations that they felt best answered the question and recorded the time required for each search. They returned all the search results and strategies to the authors.

One author (M.L.C.), a family physician with 5 years of searching experience, also performed comprehensive MEDLINE searches, when, in his judgment, it was necessary to supplement the librarians' results. We also searched for answers in medical textbooks. The textbooks (41 covering 18 subject areas) were selected from lists recommended for family practice residency libraries.<sup>34</sup> We searched an average of four texts per question.

From the textbook and MEDLINE searches, we selected between one and five references that we felt best answered the original question. Within 4 working days, we returned the full text of the selected articles or textbook sections to the physician who had asked the question. From these, each physician selected one or two references that best answered the question. Using a 7-point Likert-type scale, physicians also rated how well the references answered each question and what impact

they believed the answer would have on their practices.

At the end of the study, we asked the participating physicians for feedback about the information service we had provided in the study. They completed anonymous questionnaires about the utility and value of the information service provided in our study. We also conducted open-ended interviews with the participants.

## RESULTS

We collected 103 questions from the nine participating physicians over 217 half-days. Physicians asked a mean of 0.47 questions per half-day, ranging individually from 0.17 to 0.89 questions per half-day. We provided 86 reference packets, representing MEDLINE and textbook searches. Physicians, in turn, rated 84 (98%) of these.

Approximately two thirds (63%) of the questions originated from a patient problem, question, or physical finding. The remaining were questions about specific disease treatments (20%), laboratory test or radiographic study results (11%), or general knowledge (6%). For physicians who stated a preference about when they needed an answer to their question, 21% needed the information before the patient left the office, 7% needed it by the next day, and 35% needed it before the patient's follow-up visit (usually within 1 to 3 weeks). Approximately one third (38%) indicated "anytime" would be fine.

Adult medicine was the subject of almost one half (48%) of the questions, followed by pediatric, gynecologic, and dermatologic questions. Most inquiries concerned diagnosis and treatment of a patient's condition, but several were requests for information about specific drugs (Table). Four of the 103 questions were asked by more than one physician: "What are the treatment options for onychomycosis?" "Are serotonin reuptake inhibitors useful for chronic pain syndromes?" "When should a patient with a positive PPD test be treated?" "How long does it take to see callus formation in a fracture?"

The librarians' MEDLINE searches took a mean of 27 minutes, with a range of 5 to 60 minutes (one 180-minute outlier). For two to four textbooks, searches took a mean of 5 minutes, with a range of 2 to 12 minutes. Each answer packet sent to a

physician represented librarian- and author-conducted searches of MEDLINE and textbooks. Based on average salaries of librarians and clinicians (the authors) at the study institution and user costs for MEDLINE, the estimated average cost of a literature search to answer a physician's clinical question is \$27.50.

The physicians felt that the provided materials completely or nearly completely answered 54% (45/84) of their questions, as determined by a rating of 6 or 7 on a 7-point Likert-type scale. Thirty-five percent (29/84) of the answers had a major or fairly major impact on the physician's practice, as determined by a rating of 6 or 7 on the scale. MEDLINE searches alone produced answers for 71% (32/45) and textbooks alone answered 20% (9/45). A combination of MEDLINE and textbook searches answered 9% (4/45).

In our end-of-study questionnaire, we asked the physicians how often they would use a service such as the one provided in this study if it were commercially available. Approximately one half (55%) reported that they would use it at least twice per month (Figure). We also asked physicians to indicate how much they would be willing to pay annually for this service on a scale of \$0 to \$1500: 33% said they would pay no more than \$50 per year; 11%, \$150; 11%, \$250; and 44%, \$500. None of the respondents said they would be willing to pay \$1000 or \$1500 for this service.

## DISCUSSION

There has been only limited research on the topic of answering clinical questions. Covell<sup>1</sup> interviewed 47 internists and other specialists after every patient encounter and asked: "Do any questions occur to you that you would like answers to regarding your patient's problem?" He found that six questions occurred per half-day, 70% of which were not answered during the clinic day.

Ely<sup>5</sup> observed 30 family physicians to assess their information-seeking behavior. In this study, the physicians, who were not prompted for questions, attempted to find an answer to one question per half-day. They were able to answer 88% of these questions themselves while in their offices.

Using a study technique similar to Covell's, Gorman<sup>2,6</sup> interviewed 50 practicing primary care physicians after each patient encounter. The study

TABLE

### Categories of Clinical Questions

Category	% of Questions (n=103)
<b>Subject</b>	
Medicine, ambulatory	34
Medicine, inpatient	14
Pediatrics, ambulatory	14
Pediatrics, inpatient	3
Gynecology	12
Dermatology	9
Obstetrics	4
Orthopedics	3
Neurology	3
Other	6
<b>Type</b>	
Treatment	37
Diagnosis	29
Drug information	15
Laboratory information	8
Prognosis	6
Other	5

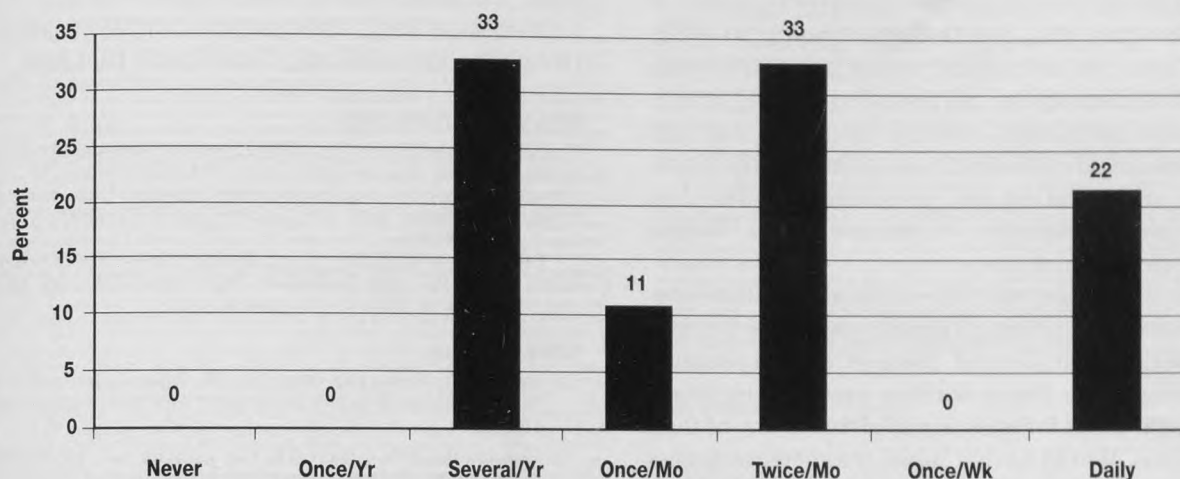
physicians asked an average of six questions per clinic half-day and attempted to answer 24% of these within 2 to 5 days.

Researchers have found that physicians ask questions at widely differing rates. The frequency appears to depend on how these questions are gathered. By prompting for questions after each patient encounter, both Covell<sup>1</sup> and Gorman<sup>2,6</sup> found that physicians had an average of six questions per half-day. Ely<sup>5</sup> observed question-answering activities without prompting, and found physicians tried to answer one question per half-day. Excluding the questions that physicians could answer in the office, Ely's physicians had 0.12 unanswered questions per half-day and Gorman's had 5.2 unanswered questions per half day.

In our study, physicians had 0.5 questions per half-day. Unlike previous research, we prompted physicians for questions at the end of a half-day, not after every patient. We felt this interview method was more likely to capture important questions and avoid those that might be asked only in response to interviewer prompting. Our method also captured questions that physicians might research on their own time, if possible. A physician

FIGURE

Physicians' responses when asked how often they would use a literature search service similar to the one provided in this study.



who is going to search for answers to difficult questions would be most likely to do so at the end of the clinic half-day.

Gorman's study<sup>2,6</sup> is the only previous attempt to find answers to physicians' clinical questions. He had medical librarians perform MEDLINE searches and select citations they thought answered the physicians' questions. The physicians received the citations 6 to 12 months after requesting them. They reported that the material found by the librarians provided a clear answer to 46% of their questions.

Our study differed from Gorman's<sup>2,6</sup> in several ways. In addition to librarian-mediated MEDLINE searches, we also searched medical textbooks. One of the authors (M.L.C.), who is a clinician, also reviewed all of the librarians' MEDLINE searches and selected citations that he felt might answer the study physicians' questions. We gave the selected materials to the physician within 4 working days. Our study physicians reported that the provided materials completely or nearly completely answered 54% of their questions.

Our findings are similar to Gorman's.<sup>2,6</sup> In each of these two different physician populations and with different medical librarians, MEDLINE searches answered approximately 45% of the clinical questions. We found that textbook searches answered an additional 11%.

One goal of this study was to simulate an information resource from which physicians could obtain relevant information with minimal effort and cost. At the end of the study, a majority of participants felt that they would use such a service and would be willing to pay for it. In the open-ended interview portion, many participants said that reading original journal articles took too long to be clinically useful. They described the ideal information source as one that would be rapidly accessible, require very little work, and provide a succinct, specific answer. A previous survey of internists and family practitioners found similar opinions.<sup>7</sup>

Our searches cost an average of \$27.50 per question, which is comparable to that found by Gorman.<sup>2,6</sup> These searches required 27 minutes of a medical librarian's time and 20 minutes of a clinician's time; Gorman's librarian searches took 43 minutes. These figures do not include the time it took the physicians to read and evaluate the citations that were provided to them.

Few practicing physicians can devote almost an hour per question to search for answers themselves. Likewise, a commercial service that replicated our study methods would cost more than most of our physicians reported they would be willing to spend.

Our study has several limitations, the most

important of which is its generalizability. We used a convenience sample of family physicians, all of whom practiced in a small midwestern city. Only one physician included obstetrics in her practice. It is reassuring that our findings relating to MEDLINE searches are similar to Gorman's, who studied physicians in the northwestern United States. We used only two medical librarians and the authors did all of the textbook searches. The physicians' estimates of the usefulness of searched material are subjective. We did not assess changes in physician behavior.

It is reassuring that the medical literature contains answers to many clinical questions, but it is disquieting that finding them is time-consuming and expensive. These barriers prevent physicians from searching for answers to all but a few of their questions. Would having rapid, inexpensive access to answers improve patient outcomes? The physicians in this study felt that the answers would influence their patient care and practices; however, we do not know whether the answers would improve the health of their patients.

How can physicians better answer their clinical questions? An ideal information system would be very easy to access and would provide timely, useful information. One possible solution would be to develop question-answer databases. These resources would contain frequently updated, evidence-based, peer-reviewed answers to specific common clinical questions. Since the database would provide answers, rather than full-text journal articles, the information would be much quicker for physicians to access than current MEDLINE-based systems. Comparable question-answer data-

bases for drug questions have been used in Europe for several years.<sup>9,10</sup>

Physicians are increasingly being urged to provide evidence-based, cost-efficient care. We believe answering their clinical questions effectively is an important step in reaching that goal.

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