

# What Clinical Information Resources Are Available in Family Physicians' Offices?

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**BACKGROUND.** When faced with questions about patient care, family physicians usually turn to books in their personal libraries for the answers. The resources in these libraries have not been adequately characterized.

**METHODS.** We recorded the titles of all medical books in the personal libraries of 103 randomly selected family physicians in eastern Iowa. We also noted all clinical information that was posted on walls, bulletin boards, refrigerators, and so forth. Participants were asked to describe their use of other resources such as computers, MEDLINE, reprint files, and "peripheral brains" (personal notebooks of clinical information). For each physician, we recorded how often the resources were used to answer clinical questions during 2 half-day observation periods.

**RESULTS.** The 103 participants owned a total of 5794 medical books, with 2836 different titles. Each physician kept an average of 56 books in the office. Prescribing references (especially the *Physicians' Desk Reference*) were most common (owned by 100% of the participants), followed by books on general internal medicine (99%), adult infectious disease (89%), and general pediatrics (83%). Books used to answer clinical questions were more likely to be up to date (copyright date within 5 years) than unused books (74% vs 27%,  $P < .001$ ). Items posted on walls included drug dosage charts and pediatric immunization schedules. Only 26% of the physicians had computers in their offices.

**CONCLUSIONS.** Drug-prescribing textbooks were the most common type of book in family physicians' offices, followed by books on general internal medicine and adult infectious diseases. Although many books were relatively old, those used to answer clinical questions were generally current.

**KEY WORDS.** Libraries, medical; physicians, family; information services; computers. (*J Fam Pract* 1999; 48:135-139)

The physician, when faced with an unfamiliar clinical problem, is advised to critically evaluate original research and to practice evidence-based medicine.<sup>1,4</sup> Studies have found that this advice is generally ignored.<sup>7-10</sup> Instead, most practicing physicians seek highly digested information from books and colleagues.<sup>7,8,11-13</sup> In the pressure-cooker atmosphere of a busy practice, physicians value rapid access and understandability more than the quality or recency of information.<sup>14,15</sup> Practicing physicians are more likely to seek information from their personal libraries than from hospital or medical school libraries, and they rarely use MEDLINE or other computer resources.<sup>8,11,16-18</sup> Although personal libraries are an important source of clinical information, little is known about their content.

The purpose of our study was to determine what information resources are available in family physicians' offices. It is important to characterize these resources because answers to clinical questions affect

patient care decisions,<sup>18,19</sup> and many of these answers come from personal libraries.<sup>8,11,16-18</sup> Knowledge about the content of these libraries could help guide the development of new information technologies, which should be built according to what physicians will find most useful.

## METHODS

### STUDY SUBJECTS

We invited a random sample of 129 family physicians to participate in our study. The sample was selected from the 386 family physicians practicing in the eastern third of Iowa (319 area code). We mailed a single descriptive letter and followed up with a telephone call requesting participation.

### PROCEDURES

We visited physicians during office hours and copied the title, author(s), publisher, and copyright year of every medical book in the office. We included all books on bookshelves, floors, and desktops in private offices, nurses' stations, and office laboratories. We also recorded any clinical information posted on walls, bulletin boards, refrigerators, cupboard doors, and so forth.

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Using a structured questionnaire, we asked physicians about their use of computers, reprint files, and "peripheral brains" (personal notebooks containing clinical information).

All information resources were categorized by topic, using a modified, specialty-based classification system.<sup>20,21</sup> Most of these categories were based on recognized medical specialties, such as adult cardiology or pediatric endocrinology. To these, we added basic sciences, such as anatomy and pharmacology. In addition, we found it necessary to add topics such as toxicology and physical diagnosis. We distinguished drug prescribing references, such as the *Physicians' Desk Reference*,<sup>22</sup> from pharmacology books, such as *Goodman & Gilman's The Pharmacological Basis of Therapeutics*.<sup>23</sup> Each physician was visited for 2 half-day periods, and we recorded the resources used to answer clinical questions during these periods. All visits occurred between April 1996 and December 1997.

### STATISTICAL ANALYSIS

Most analyses were descriptive and consisted of frequencies and probabilities. The kappa statistic was used to determine the reliability of the specialty-based classification system. We used the chi-square statistic to compare the proportion of books with a copyright date within 5 years that were used to answer questions with the same proportion among unused books. A two-tailed significance level of .05 was chosen, and all analyses were performed using Stata software (Stata Corporation; College Station, Tex).

### RESULTS

Of the 129 invited physicians, 103 (80%) agreed to participate. The mean age of participants was 48 years (range: 31 to 87). Twenty-three participants (22%) were women; 54 (52%) practiced in a rural area (population <30,000). The demographic characteristics of the participants did not differ significantly from the characteristics of the entire

study population (all practicing family physicians in the 319 area code).

### BOOKS

The 103 physicians owned a total of 5794 books with 2836 unique titles. Each physician kept an average of 56 books (standard deviation = 38; range: 2 to 207) in the office. One of the authors assigned a topic (eg, adult cardiology or orthopedics) to all books. Blinded to these assignments, a second author also categorized a random sample of 100 books. These two authors agreed on 81.4% of the books, with an expected agreement of 4.7% by chance ( $\kappa = .805$ ).

The most common topics were drug prescribing (731 books, 100% of physicians owning at least one book), general internal medicine (536, 99%), and adult infectious disease (382, 89%). The 20 most common book topics are listed in Table 1. The 20 most common book titles are listed in Table 2.

After excluding 30 books published before 1940 (possibly kept for historic value) and 65 books with unknown copyright years, the mean copyright year of the remaining 5699 books was 1984. Most books (3145, 55%) were

TABLE 1

Twenty Most Common Topics of Books in Family Physicians' Offices

| Topic                        | Total Books for All Physicians | Physicians Owning at Least One Book No. (%) | Books Owned Per Physician Mean (SD) | Books Copyrighted After Physician's Medical School Graduation Year No. (%) |
|------------------------------|--------------------------------|---|-------------------------------------|--|
| Prescribing information      | 731                            | 103 (100)                                   | 7.1 (4.1)                           | 691 (94.5)   |
| General internal medicine    | 536                            | 102 (99)                                    | 5.3 (3.7)                           | 363 (67.7)   |
| Adult infectious disease     | 382                            | 92 (89)                                     | 4.2 (3.1)                           | 310 (81.2)   |
| General pediatrics           | 265                            | 85 (83)                                     | 3.1 (2.0)                           | 176 (66.4)   |
| Orthopedics                  | 284                            | 84 (82)                                     | 3.4 (3.7)                           | 148 (52.1)   |
| Dermatology                  | 231                            | 81 (79)                                     | 2.9 (2.0)                           | 138 (59.7)   |
| Adult cardiology             | 271                            | 79 (77)                                     | 3.4 (2.7)                           | 169 (62.4)   |
| Anatomy                      | 222                            | 72 (70)                                     | 3.1 (2.8)                           | 66 (29.7)  |
| Gynecology                   | 173                            | 71 (69)                                     | 2.4 (1.5)                           | 126 (72.8)   |
| Obstetrics                   | 168                            | 68 (66)                                     | 2.5 (1.7)                           | 100 (59.5)   |
| Adult psychiatry             | 180                            | 68 (66)                                     | 2.6 (2.6)                           | 111 (61.7)   |
| Family practice              | 150                            | 66 (64)                                     | 2.3 (2.6)                           | 109 (72.7)   |
| Pediatric infectious disease | 96                             | 65 (63)                                     | 1.5 (0.8)                           | 87 (90.6)  |
| Adult neurology              | 135                            | 61 (59)                                     | 2.2 (1.6)                           | 79 (58.5)  |
| Laboratory medicine          | 124                            | 60 (58)                                     | 2.1 (1.4)                           | 55 (44.4)  |
| Adult rheumatology           | 109                            | 60 (58)                                     | 1.8 (1.0)                           | 75 (68.8)  |
| General surgery              | 132                            | 58 (56)                                     | 2.3 (1.8)                           | 53 (40.2)  |
| Medical dictionary           | 67                             | 57 (55)                                     | 1.2 (0.5)                           | 29 (43.3)  |
| Otolaryngology               | 84                             | 52 (50)                                     | 1.6 (1.4)                           | 51 (60.7)  |
| Physical diagnosis           | 79                             | 52 (50)                                     | 1.5 (0.8)                           | 18 (22.8)  |

SD denotes standard deviation.



TABLE 2

## Twenty Most Common Books in Family Physicians' Offices

| Book*  | Mean Copyright Year† (SD) | Physicians Owning at Least One Copy No. (%) |
|--|---------------------------|---|
| <i>Physicians' Desk Reference</i> . 52nd ed. Montvale, NJ: Medical Economics; 1998.  | 1996 (1.3)                | 96 (93)                                     |
| <i>Physicians' Desk Reference for Nonprescription Drugs</i> . 18th ed. Montvale, NJ: Medical Economics; 1998.                                      | 1995 (2.0)                | 83 (81)                                     |
| Gilbert DN, Moellering RC Jr, Sande MA. <i>The Sanford Guide to Antimicrobial Therapy</i> . 28th ed. Vienna, Va: Antimicrobial Therapy, Inc; 1998. | 1995 (1.6)                | 69 (67)                                     |
| Fauci AS, Braunwald E, Isselbacher KJ, et al. <i>Harrison's Principles of Internal Medicine</i> . 14th ed. New York, NY: McGraw-Hill; 1998.        | 1983 (9.8)                | 51 (50)                                     |
| Ewald GA, McKenzie CR. <i>Manual of Medical Therapeutics: The Washington Manual</i> . 28th ed. Boston, Mass: Little Brown & Co; 1995.              | 1988 (5.9)                | 48 (47)                                     |
| Best ML. <i>Compendium of Drug Therapy</i> . Secaucus, NJ: Compendium Publications Group; 1995.  | 1992 (3.4)                | 46 (45)                                     |
| Behrman RE, Kliegman RM, Arvin AM. <i>Nelson Textbook of Pediatrics</i> . 15th ed. Philadelphia, Pa: WB Saunders Co; 1996.                         | 1987 (7.7)                | 41 (40)                                     |
| Rakel RE. <i>1998 Conn's Current Therapy</i> . Philadelphia, Pa: WB Saunders Co; 1998.   | 1994 (3.3)                | 40 (39)                                     |
| Berkow R. <i>The Merck Manual</i> . 16th ed. Rahway, NJ: MSD; 1992.  | 1982 (8.6)                | 36 (35)                                     |
| Bartlett JG. <i>1995 Pocketbook of Infectious Disease Therapy</i> . Baltimore, Md: Williams & Wilkins; 1995.                                       | 1994 (1.6)                | 33 (32)                                     |
| Meyers BR. <i>Antimicrobial Therapy Guide</i> . Newtown, Pa: AP Inc; 1996.   | 1992 (2.9)                | 32 (31)                                     |
| <i>Monthly Prescribing Reference</i> . New York, NY: Prescribing Reference Inc; June 1998.   | 1995 (3.7)                | 32 (31)                                     |
| Cunningham FG, MacDonald PC, Gant NF, et al. <i>Williams Obstetrics</i> . 20th ed. Stamford, Conn: Appleton & Lange; 1997.                         | 1981 (12.3)               | 31 (30)                                     |
| Nelson JD. <i>Pocket Book of Pediatric Antimicrobial Therapy</i> . Baltimore, Md: Williams & Wilkins; 1997.  | 1994 (3.6)                | 31 (30)                                     |
| DeGowin RL. <i>DeGowin and DeGowin's Diagnostic Examination</i> . 6th ed. New York, NY: McGraw-Hill, Inc; 1994.                                    | 1975 (6.8)                | 30 (29)                                     |
| <i>Triple I Prescribing Guide</i> . New York, NY: MediMedia; 1997.   | 1996 (1.1)                | 27 (26)                                     |
| DiGregorio GJ, Barbieri EJ. <i>Handbook of Commonly Prescribed Drugs</i> . 11th ed. West Chester, Pa: Medical Surveillance Inc; 1996.              | 1993 (2.9)                | 27 (26)                                     |
| Wallach J. <i>Interpretation of Diagnostic Tests</i> . 6th ed. Boston, Mass: Little, Brown and Co; 1996.   | 1982 (7.6)                | 27 (26)                                     |
| Dickey RP. <i>Managing Contraceptive Pill Patients</i> . Durant, Okla: EMIS; 1994.   | 1990 (5.6)                | 26 (25)                                     |
| Schumacher HR. <i>Primer on the Rheumatic Diseases</i> . 10th ed. Atlanta, Ga: Arthritis Foundation; 1993  | 1987 (3.8)                | 25 (24)                                     |

SD denotes standard deviation.

\*A recent edition of each title is cited; all editions were included in the count.

†Mean copyright year of all editions found.



published within 10 years of the observation period, and the copyright year of most books (3891, 68%) was after the medical school graduation year of the physician.

## COMPUTERS AND OTHER RESOURCES

Of the 103 participants, 27 (26%) had computers in their private offices (excluding computers used only for business purposes), and 16 (16%) said they used the computer to answer clinical questions. Another 46 participants (45%) owned a computer at home (resulting in a total of 73 physicians [71%] who owned a computer).

Seventy physicians (68%) kept reprint files, and 52 (50%) said they used them to answer clinical questions. Thirty physicians (29%) had a peripheral brain; and 26 (25%) used it to answer questions. Fifty-four physicians (52%) performed at least one MEDLINE search during the previous year, while 34 physicians (33%) had never performed a MEDLINE search while in practice.

Most physicians (76%) posted at least one item of clinical information on the wall, refrigerator, cupboard door, and so forth. The most common topic areas were drug prescribing (263 items, 43% of all items), pediatric infectious disease (81, 13%), and adult infectious disease (50, 8%). The most common titles were "Recommended Childhood Immunization Schedule" (from the Advisory Committee on Immunization Practice, Centers for Disease Control, Atlanta, Ga; n = 40), "Ames Atlas of Urine Sediment" (Miles, Inc; Elkhart, Ind; n = 13), and "Synthroid Dosage Forms" (Knoll Pharmaceutical Company, Mount Olive, NJ; n = 10).

## RESOURCES USED TO ANSWER QUESTIONS

During 732 hours of observation, the 103 physicians pursued an answer for 384 questions. The most common resources used were books from personal libraries (188 of 384 questions, 49%); followed by human resources, such as physician colleagues, pharmacists, or nurses (149, 39%); and a variety of other sources (47, 12%). The most common topics of books used to answer questions were drug prescribing (96 of 188 questions, 51%), general internal medicine (23, 12%), and general pediatrics (13, 7%). The most commonly used titles were the *Physicians' Desk Reference*<sup>22</sup> (53 questions), *Monthly Prescribing Reference*<sup>24</sup> (19), and *Harrison's Principles of Internal Medicine*<sup>25</sup> (8). Books that were used to answer questions were more likely to have a copyright date within 5 years than unused books (74% vs 27%,  $P < .001$ ). Younger physicians tended to own newer books. For each 10-year increase in physician age, there was a 2.5-year decrease in mean copyright year of books in the personal library ( $P < .001$ ).

## DISCUSSION

Although often disparaged,<sup>26,27</sup> the *Physicians' Desk Reference*<sup>22</sup> was by far the favorite resource of physicians in this study. Preference for the *Physicians' Desk Reference* seems consistent with Curley and col-

leagues<sup>24,15</sup> model in which usability and physical accessibility are more important than accuracy or quality.

Our findings are consistent with other studies that found practitioners' preferred information sources were books in personal libraries, followed by the advice of colleagues.<sup>16,28,29</sup> Previous studies have found that MEDLINE and other computer applications are rarely used by practicing physicians.<sup>10,15,28,30,31</sup> In a survey of Michigan family physicians, 72% said they owned computers, a percentage similar to the 71% in our study.<sup>30</sup>

Our findings should be interpreted in light of several study-design limitations. We included only family physicians from eastern Iowa, and the extent to which our findings can be applied to other populations, especially urban physicians, is unknown. In addition, we did not study information resources available in the physician's home. Instead, we focused on immediately available resources that could be used to answer on-the-spot questions in the office.

## CONCLUSIONS

Computer applications seem to be the next logical step to improve the quality, currentness, and accessibility of relevant information for practicing physicians.<sup>32,35</sup> Traditionally, physicians have not found computers helpful for answering questions, because using them takes too long and often fails to provide relevant information.<sup>28,35-37</sup> Information retrieval systems have been designed for the researcher who needs an exhaustive search on a single topic, not for the practitioner who needs bottom-line answers on the fly.<sup>38,39</sup> But the potential exists for computerized information systems to meet the needs of practitioners. To be successful, developers will need to temper their enthusiasm with the realities of the busy office. No amount of comprehensiveness or quality will make up for the usability problems so familiar to those who have tried to work with current computer systems.<sup>35,40</sup> Such systems will only be useful if physicians are involved in their development.

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