

Evaluating Computer Capabilities in a Primary Care Practice-Based Research Network

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ABSTRACT

PURPOSE We wanted to assess computer capabilities in a primary care practice-based research network and to understand how receptive the practices were to new ideas for automation of practice activities and research.

METHOD This study was conducted among members of the Pediatric Practice Research Group (PPRG). A survey to assess computer capabilities was developed to explore hardware types, software programs, Internet connectivity and data transmission; views on privacy and security; and receptivity to future electronic data collection approaches.

RESULTS Of the 40 PPRG practices participating in the study during the autumn of 2001, all used IBM-compatible systems. Of these, 45% used stand-alone desktops, 40% had networked desktops, and approximately 15% used laptops and minicomputers. A variety of software packages were used, with most practices (82%) having software for some aspect of patient care documentation, patient accounting (90%), business support (60%), and management reports and analysis (97%). The main obstacles to expanding use of computers in patient care were insufficient staff training (63%) and privacy concerns (82%). If provided with training and support, most practices indicated they were willing to consider an array of electronic data collection options for practice-based research activities.

CONCLUSIONS There is wide variability in hardware and software use in the pediatric practice setting. Implementing electronic data collection in the PPRG would require a substantial start-up effort and ongoing training and support at the practice site.

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INTRODUCTION

Practice-based networks study issues important to primary care delivery.^{1,2} To guide improvements in practice-based research methods, it will be important to understand current computer systems.³ In 2001 the Pediatric Practice Research Group (PPRG), an experienced, regional network,^{1,2} undertook an assessment of computer capabilities in a goal to foster data system developments. This article presents our findings.

METHODS

A 14-page questionnaire was developed to assess systematically the electronic data capacity and communications in practice settings. Some questions were adapted from survey questionnaires previously developed by Children's Memorial Hospital and the American Academy of Pediatrics Pediatric Research in Office Setting network. This survey was designed to assess the practices and their computer systems, including software

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Table 1. Business and Practice Management Areas**Patient care documentation**

Maintain computer-based clinical records
 Diagnoses or problem list
 Medications list or adverse drug reactions
 Patient charting or other computer-based clinical records

Track

Immunizations
 Patients' adherence to recommended well-child visits
 Laboratory reports

Write prescriptions

Patient accounting

Bill insurance companies
 Provide customized patient statements
 Post accounts receivable by patient, by provider
 Maintain physician fee schedule
 Open item or claim, or balance forward transaction entry
 Provide cash or accrual-based accounting reports
 Real-time aging and balance of accounts

Office business support

Manage assets
 Track CLIA compliance
 Maintain employee personnel data and job descriptions

Track

Office inventory
 Vendor billing
 OSHA compliance

Process payroll

Provide patient education and marketing aids
 Provide tax management

Appointment scheduling

Provide immunization reminders
 Provide appointment reminder notices
 Print charge slips/labels for charts
 Register new patients
 Update demographic data when visits are scheduled
 Track no shows or cancellations
 On-demand appointment processing

Management reports and analysis

Track and analyze activity and revenue
 By payer
 By provider
 By service (etc)
 By patient (etc)

CLIA = Clinical Laboratory Improvement Amendments; OSHA = Occupational Safety and Health Administration.

hardware, privacy, security and confidentiality, and future computer uses. Questions were forced choice or numeric response.

Software topics sought information on software uses for (1) patient care documentation, (2) patient accounting, (3) office business support, (4) appointment scheduling, and (5) management reports and analysis. The elements assessed in each area are displayed in Table 1. A practice was considered as using software for an area if one or more specific uses

were identified. Hardware topics included questions regarding type and number of computers, Internet connectivity, and data transmission capabilities. Confidentiality topics focused on handling paper and electronic records. Practice acceptance and preparedness evaluated readiness for new data collection approaches and obstacles to expanded computer use.

RESULTS

Forty practices (83% of invited) representing 96 offices and 194 pediatricians returned a completed questionnaire. For each practice, a key administrator and physician completed the questionnaire.

Computer Capabilities

All practices used IBM-compatible computer systems, and 90% owned their hardware. There was wide variability in types of hardware used; 45% used stand-alone desktop microcomputers and 40% used networked microcomputers; 22% used notebook or laptop microcomputers, and 7% used minicomputers.

Most practices used software for management reports and analysis (97%), patient accounting (87%), and patient care documentation (60%). Approximately one half (60%) used software for business support, and 25% had appointment scheduling software. Among the 33 practices using software for patient care documentation, 30% used Medical Manager, (Medical Manager PCN, Inc, Fairfield, NJ), and the rest used any of 28 other software programs. Table 2 displays practice use of software for each aspect of patient care management.

Internet connections were available at 87% of practices, but the number of connected terminals varied: 20% had all computer terminals connected, 50% had some, and 15% had 1. Among the 35 practices with an Internet connection, 55% used it for electronic mail, 25% for their home page, and 65% to access the Web. Thirty-three percent used the Internet for data submission. The following were common obstacles to expanding Internet use: not enough computers for business and Internet use (53%), insufficient staff training or time (50%), and privacy concerns (50%).

Most respondents (82%) had concerns about patient confidentiality (27% a lot, 27% moderate, 32% some, 14% minor), primarily regarding security of electronic records. Twenty-eight percent perceived themselves as having insufficient security for patient confidentiality with electronic information.

Respondents were open to increased use of computers for research data collection. Most were willing to consider handheld touch-screen devices not linked to the practice system (63%), downloading questionnaires from the Web (66%), and Web-based questionnaires (58%).

Table 2. Use of Software for Patient Care Documentation

Computer-Based Clinical Records	Percent Using
Diagnoses or problem list	38
Medication list, including adverse drug reactions	5
All patient charting	0
Other computer-based clinical records (specify)	8
Track immunization	25
Track patients' adherence to recommended well-child visits	20
Track laboratory reports	15
Write prescriptions	13
Provide information on drug interactions	13
Provide information on chronic disease management	10
Provide telephone triage protocols for office staff	10
Accept dictation directly into patients' computer records via voice recognition	0
Internet access (eg, person on call, emergency department staff, etc)	18
Diagnoses or problem list	38

There were many obstacles to expanding computer use: insufficient staff training and time (61%), hardware and software limitations (55%), and costs (40%).

DISCUSSION

Our study provides new information relevant to primary care practice-based research network computer capabilities.

"Our network practices use PCs, not Macs." Electronic data collection must take into account the compatibility of operating systems and the variety of experiences with computers, including differences in training.

A great variability exists in the software used. Business and practice management tasks that are computerized vary between sites. Software variations appeared to relate more to which tasks were computerized at a particular practice; there was some consistency in software choices for particular practice management and patient care areas.

Computers were not consistently connected to the Internet. This finding seems to relate to insufficient hardware, staff time, training issues, and concerns about data privacy. Data collection approaches cannot, at this time, assume that office computers can connect to the Web. It also indicates that there are training needs—and opportunities—related to Internet use, and that practices must be assured excellent data security measures before they engage in data transfer over the Internet.

Clinicians and their practices were open to expand-

ing computer use. To facilitate such a move, obstacles that have kept computer use low must be addressed, including limitations in staff time, current availability of hardware and software, and training. Studies that use computer technology must include a budget to overcome these limitations.

"Practices in our network are all different." This finding affects all aspects of practice operation. As a result, current systems do not allow for standardized computer data collection for research purposes.

Limitations

This study was conducted in a single, regional pediatric research network among diverse practices, so generalization from the findings presented must be done with caution. The data for this study was collected in 2000-2001, and the technology landscape is changing rapidly.

CONCLUSIONS

All surveyed practices in our network used PCs. A minority of computers were connected to the Internet. PPRG electronic data collection approaches must account for the variety of software, staffing, and computer training needs found. For Internet data collection in practices such as ours, a substantial start-up effort will be required. These data can guide planning by networks with similar practice structures.

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