Short report: Medical informatics

How do family medicine educators at McMaster University use it and teach it?

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Competence in computer services and medical informatics is seen as increasingly important for health professionals.[1] Thus far, few family medicine programs in Canada or elsewhere provide adequate instruction in this area. Where such instruction exists, it generally lacks clear learning objectives and tends to be poorly integrated into general medical education. While many family medicine programs are slow to offer residents a coherent informatics curriculum, most residents want more computer and informatics training and think it should be a mandatory component of family medicine programs.[2]

A study of first-year residents in all Canadian university-affiliated family medicine residency programs during the 1993-1994 academic year found that only 13% of respondents felt extremely or very comfortable with using computers. The most commonly cited barriers to obtaining computer training were lack of time and the high cost of computers, but not lack of interest. Residents were willing to have computer instruction included in their residency training (71%), and about half of respondents (46%) were willing to be evaluated on their skills. They thought the type of computer training most useful to them would include word processing (65%), database searching (64%), office billing (61%), and office management (50%).[2]

To facilitate the development and implementation of a fully integrated medical informatics and computer services curriculum in our program, we decided to assess how much family practice educators in the Department of Family Medicine at McMaster University were using computers and medical informatics in routine clinical practice and teaching. In spring 1998, we mailed a survey to all family practice teaching staff (33 preceptors in three academic family practice units and 16 community family physician preceptors) asking about their routine use of computers and teaching about computers to family medicine residents. Of 49 questionnaires mailed out, 47 usable ones were returned for a final response rate of 96%. Respondents included 34 physicians, nine nurses and nurse practitioners, and four social workers.

The questionnaire collected sociodemographic characteristics, self-reported computer use and knowledge, and adequacy of currently available computer hardware and software and listed 12 commonly used computer applications. For each application, respondents were asked to indicate whether it was available in their practices. Each of the 12 applications or tools was then rated on a 7-point Likert-type scale in terms of frequency of use as part of routine clinical practice, frequency of teaching about it as part of routine teaching, perceived improvement in clinical practice associated with use of each application, and interest in developing more skill in each area.

Most respondents (82.2%, 37/45) reported they personally used a computer at work, and the overall mean for self-assessed computer knowledge was 3.7 on the 7-point scale (standard deviation [SD] 1.6). The overall mean rating for perceived adequacy of currently available computer hardware and software was 4.6 (SD 1.7). Nine of the 12 applications surveyed were available to more than 50% of preceptors. Three applications (appointments, billing, and e-mail) were available most frequently, with mean scores higher than 4.5. Reported mean scores for teaching computer-based tools and applications to residents were low, except for appointment software, with a mean of 5.9.

Preceptors viewed appointment software as improving their routine practice (mean 4.4), but all

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Table 1. **Availability, routine use, routine teaching, perceived improvement in practice associated with, and interest in, further training for 12 computer applications assessed on a 7-point Likert-type scale**

	NO. WHO HAD IT AVAILABLE (%)	ROUTINE USE, MEAN SCORE (SD)	ROUTINE TEACHING, MEAN SCORE (SD)	IMPROVES PRACTICE, MEAN SCORE (SD)	FURTHER TRAINING DESIRED, MEAN SCORE (SD)
E-mail	44 (94)	4.9 (2.3)	3.0 (2.1)	3.3 (1.9)	3.6 (2.0)
MEDLINE searching	36 (77)	3.5 (2.1)	2.8 (2.1)	3.9 (2.2)	4.5 (1.9)
Other internet resources	34 (72)	3.0 (1.8)	2.4 (1.7)	3.3 (1.9)	5.0 (1.7)
Internet discussion and mailing groups	25 (53)	2.0 (1.6)	1.5 (1.0)	2.1 (1.3)	3.4 (2.1)
Searchable reference systems	28 (60)	2.8 (1.9)	2.5 (1.9)	3.2 (2.1)	4.4 (2.2)
Word processing	42 (89)	3.8 (2.3)	1.6 (1.0)	3.1 (2.4)	3.4 (2.0)
Presentation software	13 (28)	2.4 (2.0)	1.4 (1.0)	2.1 (1.7)	4.2 (2.1)
Spreadsheet and database software	24 (51)	2.6 (1.9)	1.6 (1.1)	2.3 (1.8)	3.5 (2.1)
Statistical software	19 (40)	1.7 (1.2)	1.5 (1.2)	1.9 (1.4)	3.8 (2.1)
Billing software	32 (68)	4.3 (2.9)	2.6 (2.0)	3.4 (2.3)	2.5 (1.9)
Appointment software	42 (89)	5.9 (2.0)	4.1 (2.2)	4.4 (2.2)	3.1 (2.1)
Electronic patient records	16 (34)	2.3 (2.1)	2.5 (2.1)	2.4 (2.1)	4.5 (2.1)

Key points

- This survey of McMaster University family medicine educators found computers were used most frequently for word processing, billing, e-mail, and making appointments.
- Highest interest in learning new informatics skills was for Internet resources, searching MEDLINE, electronic patient records, searchable CD-ROMS, and presentation software.

Points de repère

- Ce sondage auprès des enseignants en médecine familiale de la McMaster University a révélé que les ordinateurs étaient le plus fréquemment utilisés pour le traitement de textes, la facturation, les courriels et les rendez-vous.
- En ce qui avait trait à l'apprentissage de nouvelles compétences en informatique, on s'intéressait surtout aux ressources sur Internet, à la recherche dans MEDLINE, aux dossiers électroniques des patients, aux cédéroms consultables et aux logiciels de présentation.

other applications were rated as relatively unlikely to improve their practice, with reported means of lower than 4. In contrast, interest in receiving further training was relatively low for appointment and billing software but considerably higher for Internet-based services, presentation software, and electronic patient records (**Table 1**).

As other researchers have found, preceptors' use of computers appears to be based on their perceived usefulness in meeting daily work requirements. Applications that have a direct, daily relevance were described as most used and, consequently, most taught to residents. These included appointment and billing software, and e-mail. Because these applications were most familiar and widely available, little interest was reported in learning more about them. Preceptors, however, expressed a high degree of interest in learning about relatively "newer" applications, such as Internet resources (including MEDLINE), electronic patient records, searchable CD-ROMs, and presentation software.

Overall, preceptors reported that they infrequently taught computer skills to residents. The most frequently taught computer application was appointment software, but the mean score for this was 4.1. Other applications had mean scores lower than 3 on the 7-point scale. As expected, preceptors' own routine use of specific computer tools and applications tended to overlap with the frequency of teaching these applications to residents.

This finding, along with the relatively high interest in further developing skills in most of the areas surveyed, suggests that successful implementation of a medical informatics and computer services curriculum should start with faculty development and follow with the "seamless" integration of informatics as an integral part of the family medicine residency curriculum. Because computer competence is becoming essential for practising family physicians, family medicine educators should be urgently concerned about teaching it effectively and integrating informatics into their curriculums.

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References

1. Cameron S. Toward a national curriculum in informatics. *Can Fam Physician* 1998;44:2044-6 (Eng), 1998;44:2053-6 (Fr).
2. Rowe B, Ryan D, Therrien S, Mulloy J. First-year family medicine residents' user of computers: knowledge, skills and attitudes. *Can Med Assoc J* 1995;153(3):267-72.

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