Information technology creeps into rural general practice

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Abstract

This study looked at the effect of information technology on rural medical practice. Eight GPs in rural medial practice in Victoria were interviewed, and World Wide Web sites were accessed for information relevant to the rural GPs use of information technology. The results indicated that rural GPs are developing their use of information technology according to their needs. The use of information technology is changing the nature of rural medical practice, and bringing more support and information to rural GPs. However, some of the technologies now available are of little perceived use to the GPs, and GPs with good support staff are better able to take advantage of the technology than GPs with little or inadequate support. The findings of this study have implications for policies being implemented to increase the availability of information technology to support rural health care.

Background

In the last decade information technology has developed to the stage where computer-based programs and applications provide the functionality that will support the clinical and administration processes in medical practice (Project for Rural Health Communications and Information Technologies, 1996). Computer enthusiasts in the medical profession, the computer industry and increasingly the Australian government encourage general practitioners in Australia to make use of the technology (Richards et al, 1999). In rural areas, information technology is claimed to offer solutions to overcome some of the problems rural GPs face in providing health care such as insufficient professional support, scarcity of information resources, lack of access to continuing medical education, the wide variety of procedures undertaken, and long hours worked (Strasser et al, 1997).

Information technology is an umbrella term that covers a wide variety of technologies. In this instance, it is used in connection with technologies used for communication, storing, retrieving and packaging, and in particular the information technologies of computers, databases and telecommunications via computers (Green & Guinnery, 1994).

Rural GPs are rapidly increasing their use of information technology. In 1996 the PRHCIT report (Project for Rural Health Communications and Information Technologies, 1996) indicated that 65% of health care professionals in rural and remote areas used computers in their work. By 1999/2000 this increased to approximately 85% (Britt et al, 2001). While benefits to rural GPs are promoted, it is important to evaluate the actual situation.

All Western medical care is based on an ideology in which knowledge of evidence-based medicine is the basis of undertaking health care (Hodgkin, 1996). In considering health care in rural areas, it is required that this be within the framework of rural medical practice as a distinct discipline, with all its inherent characteristics. Knowledge of the situation in which rural GPs provide health care allows examination of the changes that information technology is bringing to rural medical practice. The effect of these changes on the discipline of rural medical practice is of particular importance to health service planners and policy makers.

The main focus of the Australian literature covering information technology and rural medical practitioners is telehealth. The economics, effectiveness, areas of use, patient comfort with telehealth, benefits for decreasing isolation, and continuing education using this medium are well covered by authors such as Togno (1996), Yellowlees & Kennedy (1997), Hornsby (1999), and O'Connor et al (2000). The international literature also focuses on telehealth (Gustke et al, 1999; Davis et al, 2001).

There is little Australian or international literature covering other aspects of information technology in rural medical practice, such as training and support needs or e-mail use. A small amount of Australian literature considers the issue of medical recording. The progression of medical practices towards using fully computerised patient records and advantages for GPs is discussed by Rosenthal (1999/2000). Fraser (1995) considered implementation of computerized patient records for an Aboriginal population in the Northern Territory and resulting continuity of care and program planning, in particular issues of confidentiality and ownership. The international literature also provides some information on the use of databases for medical recording, and has similar positive findings on the benefits and effectiveness of information technology for rural GPs. However, the impact of information technology on rural general practice has not been well covered.

This study was undertaken in Victoria, Australia, to explore how information technology changes rural medical practice, and whether it assists in maintaining or improving the environment in which rural health care is undertaken.

Methods

Interviews were conducted with eight rural GPs. Interviewees were selected randomly from rural towns both East and West of Melbourne in Victoria. Sixteen practices that used information technology within their surgeries were contacted. GPs from seven practices agreed to be interviewed, one practice providing two GPs. Of those practices which did not provide GPs for interview, reasons for declining included; participation in the study did not contribute to Continuing Medical Education points, there was no payment for participation, and the workload of the GPs. Six male and two female GPs were interviewed, giving a ratio of one in four females which corresponds with the proportion of female GPs practicing in rural areas identified in the BEACH report (Britt 2001).

Rurality of those interviewed, using the RRMA classification system (Department of Primary Industries and Department of Human Services and Health, 1994), was in the 'other rural' category with populations ranging from 9,790 down to less than 4,000, apart from one town with a population of 18,993 which RRMA categorises as a 'small rural centre'. Distances were between 85k and 518k from Melbourne (Health Service Profiles for Victorian Rural regions, 2001).

The interviews were taped and transcribed for analysis. Interviews were conducted in person using semi structured questionnaires, in which a basic set of questions were asked, but replies were followed up to provide more in-depth information. The questions that framed the format of the discussions in the interviews are shown in Appendix A.

Results

The most used aspects of information technology reported by the rural GPs are the electronic medical records and World Wide Web (Web). E-mail use was not extensive but appeared to be gradually increasing, as was store and forward technology. However, video-conferencing and electronic discussion groups are currently used very little.

Electronic medical records

The introduction of the electronic medical record has meant that doctors have had to deal with new methods of recording patient information. All the GPs interviewed used Medical Director, sold by HCN: Health Communications Network in Australia, as the program for recording patient information. Five of the eight GPs were directly entering patient data into the medical records. The GPs also used the program for writing prescriptions, and apart from one GP, used it to write their patient referrals. Many of these GPs indicated that a valuable feature of the program was its ability to enable searching of the medical records of patients by sex,

age, medication or disease, or a combination, but the GPs also felt that the program still needed further refinement of the search parameters available to locate patients with particular needs. The decision support tools in Medical Director were of particular interest to the GPs. Medical Director incorporates the Cochrane Library of medical research reviews, Harrison's Online with updated information from 'Harrison's Principles of Internal Medicine', antibiotic guidelines and various other decision support tools within the same program. The drug reference database incorporated in the program was mentioned by many of the GPs as also being particularly valuable for providing information quickly on adverse effects and contraindications.

Not so welcome for many of the GPs were the advertising features incorporated in the program, which appear when drugs are being checked and referrals are written. They find the advertisements annoying but acknowledge that they are needed to pay for producing the database programs. Also unwelcome was the fact that the program is becoming slower and clumsier as the developers incorporate more features. It was felt that better use could be made of existing programs, such as the Microsoft word processing program 'Microsoft Word' for the writing of referrals, and links created rather than endeavouring to be a single program that tries to do everything.

World Wide Web information
Six of the doctors used the Web to locate medical information, and found it an excellent resource. The GPs spoke of a range of Web sources that they used, some of the GPs using the Web more extensively than others. Web sites valued included the Cochrane Database, British Medical Journal, Royal Australian College of General Practitioners, Medscape and the Canadian Journal of Family Practice. Web sites that provided good patient information, such as the Australian Government's 'Health Insite' were also mentioned. The two GPs that did not use the Web for locating information were not yet fully computer linked, and one of them was keeping a file of useful Web sites for future use.

E-mail
The GPs indicated that the use of e-mail as a communication tool was still in an exploratory stage, and its use varied. Five of the eight use e-mail to communicate with fellow health care professionals. It was also used for some committee work, and both an e-mail continuing education subject group and GP Supervisors group that operated similarly to a 'list'. The major problem highlighted with e-mail was its asynchronous nature. The GPs found producing a natural 'to and fro' line of communication problematic and delays by recipients in responding created difficulties. Communicating with specialists was particularly difficult, as while many specialists indicated they were willing to use e-mail, they often did not respond.

E-mail contact with patients was an issue. Two of the doctors interviewed had e-mail contact with some of their patients, and were happy to do so. This was undertaken after establishing with the patients that they were comfortable with e-mailing. It involved sending results, and responding to patients' queries, as part of the extension of consultations that had taken place in person. Two other GPs spoke of contacting patients by e-mail, but were not happy to do so, and use would be selective. They expressed concerns about receiving 'spam' and 'junk e-mail' and thought that it would take a lot of work.

Store and forward
Store and forward technology is often considered to relate to the transferring of digital images between health care professionals, but in this instance it is used to refer to the storing and forwarding of results from various diagnostic services, such as pathology and imaging services, to the GPs. Results from various samples, pap smear tests and images are stored by the services and downloaded at regular intervals. Six of the GPs mentioned using this facility, and were pleased with the downloads that occurred at regular intervals, and the GPs were then able to view on their computers. Several of the GPs had some problems with the technology not working properly, but were looking forward to using it when the programs or services were able to restore or implement full functionality.

Video-conferencing
Apart from one of the GPs, all had participated in video-conferencing either for patient care, meetings, group consultations with a lawyer, or a discussion with consultants at a Melbourne hospital. Six of the eight GPs, however, thought that video-conferencing was not really useful. Reasons given were the need for advance

planning, quality of the video images, lack of need for the visual exchange, and preference for the familiarity of the telephone conversations. The need to travel to the video conferencing location was also mentioned, as although two of the medical practices were adjacent to the local hospital, the other practices were not located in the immediate vicinity of the health services where the video-conferencing facilities were located. Only one of the GPs found video conferencing useful for some consultations, particularly so with some dermatology style problems where images can be important with diagnosis and a specialist at a Melbourne hospital can be consulted. It was also useful for having a radiologist online for x-rays of fractures and other radiological requirements. Detailed findings from this aspect of the study are covered in Robinson (2002).

Electronic discussion groups

There was little interest in electronic discussion groups. One GP had tried them, but felt they were just a 'talkfest' with little substance. Several GPs had concerns with these groups that related to the privacy and confidentiality of patient information and were very concerned about secure contact within the group. The fact that the discussion groups reviewed seemed unused, with a lack of good interactivity, was also noted. As a result, the GPs felt this medium failed to offer any advantages for obtaining information.

Constraints on information technology use

The biggest problem these eight GPs had with information technology was the need for training in the use of the technology, and obtaining good information technology support. They all worked long hours, and finding the time to learn how to use the new programs and technologies was difficult. The medical information technology programs are not always intuitive, and it takes time at the computer to learn how to use the features of the program. Training is not easily available, and it is mostly the GPs in the practice or other practice staff that are information technology enthusiasts that become the support staff for assisting with implementing the use of the programs and technologies. Information technology support when programs don't work, or the technology fails, is also difficult to obtain. Some GPs had good support from their Divisions of General Practice. For three of the GPs, obtaining support was particularly difficult. Two of them found the commercially available information technology support from local business inadequate and often delayed, and the third having tried both commercial and divisional support was particularly frustrated with the computer and program crashes that were a regular feature in the practice.

Many of the GPs mentioned issues of time as another problem in implementing the technology. Apart from the time taken to learn how to use the technology, searching the Web can be time consuming, and there is also the time taken setting up video-conferencing.

Another major concern was the reliability of the technology. Power outages can mean records are unable to be accessed when needed, and extra work is required to input data when computer function is restored. As mentioned earlier, the electronic medical record databases have become slower and more cumbersome to use as more features are added and more information is put in. Systems occasionally crash for no perceivable reason. One of the practices had not been able to obtain the pathology results from the pathologist in a larger regional town for over a month, and another GP found that results when accessed were incomplete.

A last issue briefly referred to was the disinterest of colleagues in implementing the new technologies when current methods of providing health care were considered adequate.

Discussion

Information obtained from the eight GPs in the study suggests aspects of information technology beginning to make a difference in rural medical practice relate to the areas of support and training, decision support tools, health promotion, and communication. Increased access to healthcare through the use of videoconferencing, or telehealth as it is often referred to, is the area not currently fulfilling its potential.

Support and training

Where adequate information technology support and training are provided, overall the information from the interviews indicates the GPs are becoming very competent users. This includes those who have not used the

information technologies extensively, as they are exploring the options for implementing information technology further within their medical practices. For these rural GPs, the main lack of confidence stems from issues that relate to establishing any new processes. Time to learn the new programs and applications is scarce as GPs often work many hours overtime just to manage the basic health care needs of their patients, and it also takes time to adapt to change.

Knowledgeable system support is lacking, as there are very few businesses with knowledge of the systems that best support the medical practices. The GPs that successfully established the new processes were the most satisfied with the technologies used. Those with support people with a high level of information technology knowledge within their staff, or from their Division of General Practice, were much happier with the technology, whilst those relying on commercial support, or lacking adequate Division support, had much more difficulty with implementation.

Much more training and support is needed, whether it be developed commercially, or made available through government programs such as the General Practice Information Management and Technology Projects, provided by the Government in collaboration with the General Practice Computing Group through Division of General Practice programs in 2000-01. The agencies and entities that have been promoting the use of information technology in health care facilities need to consider the processes in place to support their implementation by rural GPs.

Decision support tools

The evidence base on which health care is provided is increasing exponentially. It is almost impossible for the rural GPs to keep up with this knowledge due to the professional isolation and lack of access to information resources which is a part of the environment in which rural GPs work (Strasser et al, 1997). Within rural general practice both the electronic medical record programs used by the GPs and the Web are creating access to information. For the GPs, this is an important step forward as a major concern of rural GPs for many years has been the professional isolation due to geographical isolation, and difficulty of obtaining up to date information.

The drug databases, digital texts, and other guidelines now available within the electronic medical record program provides a decision support tool that these GPs are finding to be of great value. They are also finding the information available via the Web of value through Web sites providing a portal, such as Medscape, and the on-line medical journals, such as the BMJ. The e-mail contact with fellow professionals, although providing some problems due to the asynchronous nature of e-mail, is also coming into use. No longer are these rural GPs required to be a repository of all health care knowledge, as they can access sources of information according to their and their patients needs.

Health promotion

Characteristics of rural people are stoicism and self-reliance (Brown, 1991; Tonna, 1991) and a tendency to have some distrust of experts, including medical practitioners (Humphreys, 1996). Rural people are much more inclined to shrug off health issues, and deal with minor health problems themselves, with the results that it is only when a health issue impacts on them in a major way that they turn to GPs for health care. The facility of the electronic medical records that enables rural GPs to undertake health promotion may assist them to reach out to rural people through alerting them to ongoing health prevention needs and providing them with information to better manage their health care. The electronic medical records program allows the drawing out of patients names based on their health care profile. This enables the GPs to alert them to the need for a check up, or preventive health care actions that can be taken in order to minimize possible health problems.

Communication

Access to the Web and the use of the electronic medical records also enables GPs to address the stoicism and self-reliance of rural people through improving the communication between GPs and their patients. The drug advertisements that appear when aspects of the electronic medical records are used stimulates patient discussion, and the patients also bring to their consultations Web information. The patients bring in the information either because it applies to symptoms they are concerned with, or issues resulting from a diagnosis already made. These sources of information often precipitate discussion, and through their Web knowledge the GPs refer their patients to more appropriate health resources on the Web.

Access to health care

Barlow (1999) wrote of the possibilities that information technology provides for supplementing rural services. The difficulty of obtaining specialist support in rural areas is an area information technology has the potential to address. However, with a lack of interest by the majority of the GPs in using video-conferencing for patient care, and the difficulties of receiving timely replies to emails sent to specialists, information technology is not achieving this increase in access to specialist services. In this aspect information technology is not currently supportive in increasing access to health care for rural people. The GPs consider it too complicated, and points of access are not within their practices, nor perceived as readily accessible.

Conclusion

The use of information technology in rural medical practice is still very much in its infancy. There is little interest in video-conferencing and electronic discussion groups, most of the GPs finding them of little value, and there is a need to reassess the implementation of video-conferencing facilities. There is also a need to reassess the provision of support and training in information technology for rural GPs. However, the GPs value and use increasingly electronic medical record programs, the Web, e-mail, and store and forward technologies. In particular these technologies increase professional support and access to information resources. They are creating a more supportive environment for the discipline of rural medical practice, and a more informed decision-making process between GPs and patients. This improved environment in which rural medical practice is carried out has positive implications for the future recruitment and retention of GPs in rural medical practice.

Acknowledgements

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Appendix A: Questions Framework

Do you use E-mail?
How does it work for you? Issues of concern?

Do you use the World Wide Web (General Health Web Sites, Public Domain databases), on-line full text journals?
How does it work for you? Issues of concern?

Do you participate in discussion groups?
How does it work for you? Issues of concern?

Do you use Medical Databases (eg, Medical Director)?
How does it work for you? Issues of concern?

Do you use video-conferencing?
How does it work for you? Issues of concern?

What are the barriers to using information technology?

What do you feel are the main advantages of information technology? (eg, easier access to information; more support from colleagues)

What do you feel are the main disadvantages of information technology? (eg, more onerous reporting requirements; less independence; less privacy of patient information)

Are there any issues of particular concern to do with information technology that you have not previously mentioned?