18

Remote access

WENDY MCPHEE

This chapter describes, as an example of the use of remote access, the development of a computer telecommunications network linking primary health care practitioners throughout both the isolated rural and outback areas of Australia and insular urban general practitioners. This project is called the Primary Health Orientated Computer Users' System, or PHOCUS. Details of project utilisation and user acceptance are also described.

The delivery of primary health care in a rural setting is one of the most challenging and personally satisfying areas of medical practice. It is also, however, an under-serviced area and an unpopular career choice for many young medical graduates in Australia. (Committee of Inquity into Medical Education and Medical Workforce 1988, Piterman 1989) Remote access to technology is of significant concern not only to rural doctors but to all health professionals who supply health services in remote and rural Australia. Remote areas are generally serviced by Remote Area Nurses (RANs) and the Royal Flying Doctor Service. Reliable energy sources and technical back-up services, both of which are of paramount importance, are often not available in remote areas. Furthermore RANs are not in an autonomous financial position to choose computer technology as a high priority in their practice. As full-time employees of governments RANs' access to the financial decision making processes and flexible leave arrangements for staff development are virtually non-existent.

The Primary Health Orientated Computer User's System (PHOCUS) is a collection of personal computers linked via telephone. It has been designed by a group of both country and metropolitan doctors in conjunction with Medical Informatics, Faculty of Medicine at Monash University. The system is intended to improve communication between general practitioners working in isolated rural or "outback" areas and those working in often solitary urban medical centres.

This chapter will describe the background behind the PHOCUS project, the communication systems which have preceded it and the needs of the users. It also details the setting up and running of the system, its current functions and the scope for further applications in the future.

Background

Australia is a wide brown land with a green fringe The majority of the population live in large cities along the coastline of the country. Smaller towns and farming settlements are scattered across the middle of the country in isolated rural and outback areas and often separated by hundreds of kilometres of desert. In many country areas, where the population is spread much less densely than in the cities, the general practitioner may be the only doctor in town. Such towns are often many hours away from the nearest hospital with specialist medical services.

Primary health care in a rural areas can therefore provide one of the few remaining opportunities for general medical practitioner to utilise the full range of skills acquired during undergraduate and postgraduate training. The proliferation of medical specialists in urban areas has made it increasingly difficult for city based general practitioners to practise anaesthetics, obstetrics, radiology and surgery without drawing criticism for being underqualified for the job. It is rare for urban general practitioners to even have admitting rights to public hospitals. In the country, however, the general practitioner is often the best-qualified, indeed the only, doctor in the area who can perform multiple procedures. This emphasises the need for country doctors to be properly trained and well-supported in their role. One of the major problems of rural medical practice is isolation. This isolation may be geographic, professional or intellectual.

Geographical isolation

The oft-quoted “tyranny of distance” (Blainey 1966) has been an impediment to the development of Australia since the first aboriginal settlers arrived many thousands of years ago. It has been a credit to the various races of Australians that this tyranny has been reduced and often conquered in many cases. The motor car and the telephone have been two inventions with have vastly improved the ability to communicate and interact with neighbours, near and far. Rural doctors often complain that they spend an inordinate amount of time on the telephone and in their cars, incurring large expenses. Time spent travelling alone is also time away from family and patients.

Professional isolation

As mentioned in many country areas the general practitioner may be the only doctor within a radius of many hundreds of kilometres. Even in towns with more than one doctor, communication between doctors may be compromised by the atmosphere of competition between what are, in effect, small businesses. Professional isolation also occurs in cities where a general practitioner may have no regular contact with other local doctors; the problem is often ameliorated for city doctors by the ease of access to other peer group resources and the occasional pharmaceutical company-sponsored dinner. It is often difficult for country doctors to leave their towns to attend regional educational meetings or peer-group social events. Such doctors often feel “tethered to the town” and this may engender feelings of resentment and eventual antipathy towards one’s patients.

Intellectual isolation

Rural practitioners receive much printed material, such as medical journals and drug advertising, through the mail. It has been noted that a one way flow of information with little avenue for input can actually increase feelings of isolation. In a similar way, being the passive recipient of aid from a "paternalistic" organisation can stifle any feelings of self-direction and motivation on the part of the recipient.

Larger country towns often have Base Hospitals which occasionally organise clinical meetings for doctors to hear a visiting specialist speak or discuss a current medical topic. These programmes are popular and usually well attended but they tend to be sporadic and the fleeting contact with a city specialist may increase the emphasis on the country doctor's true isolation.

The advent of the facsimile machine has improved the lot of the country doctor. Many doctors use the fax to receive pathology results and send electrocardiographs to colleagues for a second opinion, however the slowness of transmission and the poor quality reproduction can be frustrating. The cost of transmitting large amounts of data over a large distance is expensive and the end product is greasy, flimsy, difficult to file and soon disintegrates. Nevertheless a telephone and fax machine do give a doctor a verbal link to millions of fellow telephone users around the world as well as the capacity to send and receive visual images of poor quality. High quality images can be summoned via the mail but a lag time of several days, at least, is unavoidable. Neither of these systems is totally adequate for the day to day needs of general practitioners.

Telecommunications and the needs of rural doctors

Telecommunication networks are not new. Most Australians have contact with one or more networks during the course of a single day whether it be while banking, telephoning or watching television. The term "networking" has been adopted into everyday usage to suggest a group of people with various skills who form a resource base for solving problems. The term implies the gaining of strength and breadth by interweaving single threads to form a more complex structure. In the situation of a computer network, the threads are usually personal computers which have been linked together to greatly increase their power and flexibility. This linkage allows communication between users and access to huge amounts of data and programmes.

Similar communications networks have been developed in the past (Mason 1989, Meeks 1986) although none specifically address the needs of the rural practitioner in Australia. The advantages of such a telecommunication network to rural doctors is obvious and this has been confirmed at meetings of rural doctors around Australia where this proposal has received solid support and generated a group of keen participants.

Project establishment

A focus workshop was held with a sample group of ten country doctors each with some degree of previous experience in using a computer. This group was given the task of determining what was needed to improve the ability of rural general practitioners to

communicate with their peers and with the community in general. The group decided that the ideal system would need to have these qualities:

- low initial purchase price
- enough usefulness to justify purchase
- economy of operation
- user-friendliness
- speed of operation
- versatility to perform local functions

The ten doctors then generated a "wish list" of what they would like to use on this telecommunications network. This list included electronic mail, bulletin board facilities, direct billing of the government health system, continuing medical education, access to databases of medical literature, drugs and travellers advice, generation of patient handouts, on line pathology and radiology results, access to medical, research and computer consultants and sharing of software.

The ten doctors subsequently became the pilot group in the establishment of this Australia-wide computer network for the use of primary health practitioners. The pilot phase ran for a period of four months. The users were supplied with the necessary hardware and taught how to log on to the network. Their usage of the network over the pilot period was monitored and they were involved in a continuing evaluation of the system and its facilities.

Modifications suggested by the pilot group were carried out on the system and it is now being expanded to involve 140 users. These are be the original 10 members of the pilot group plus 90 general practitioners recruited through advertisements in the medical press, by targeting doctors who have registered their interest in medical computing with the Royal Australian College of General Practitioners and by a Rural Health Support Education and Training (RHSET) grant obtained by Monash University.

Current functions

The first step of the pilot group was to establish electronic mail contact. A Bulletin board facility was added. This was initially used for sharing clinical information and seeking consensus standards of management and ideas on office procedures. An electronic journal club has been established with users sharing details from interesting and relevant articles in a wide range of medical journals. Limited use of the system has been made by rural specialists who have made themselves available to discuss clinical problems in a form of electronic referral. Suggestions for the establishment of special interest groups among the users have been received.

The continuing medical education needs of the doctors has been addressed with the inclusion of computer based teaching programmes on the network. Funding has been obtained to develop continuing medical education programmes on therapeutics and the safe and rational prescribing of common medications. These programmes will be evaluated through their use on this system.

Referral to specialists, using the system, has begun to occur. In one dramatic case, a solo doctor in a very isolated region received a quick response and advice from a paediatrician on

the management of a sick child. The users have started to generate their own patient information handouts on common conditions and these are being used and refined by members of the group.

File transfer, primarily of word processing documents, has been widely utilised and the ability to transfer high quality graphic images is being developed. Doctors have also taken the opportunity to gain advice on research and medical computing by accessing the relevant experts within Monash University. At this stage, due to cost, limited use has been made of international bulletin boards and newsgroups.

The doctors are also able to use the system to assist with the commercial aspects of their general practice with access to electronic banking, electronic ordering of stock and direct billing to the government health service. It is interesting to note that the supervising group at Monash University is not acting as a central office, but rather as a systems maintenance and trouble shooting crew. This system is being developed by the users to address their own needs and Monash just acts as one of several information providers.

Future applications

The scope for future applications of this system is really only limited by the imagination and desires of the users. A register of specialists is being developed and our specialist colleagues are being encouraged to become involved in this project. The establishment of an electrocardiograph consultancy service is also being mooted. The opportunity to use this system as a gateway to other medical databases is being explored. Requested databases include poisons information, drug details and interactions and traveller's advice. The utilisation of on line pathology and radiology reports is also being established with companies and laboratories serving rural areas.

One of the interesting, but not surprising, aspects of the project is that city based general practitioners have also shown a keen interest in getting involved. It seems that the problems of isolation are also shared by many doctors in small or solo practices and the system will be expanded to address the needs of these doctors as well.

Conclusion

With 140 users the network has become busy. The pre-pilot phase has demonstrated the areas of most interest and usefulness to the users and these areas are being developed preferentially. Further coordination and evaluation of the usage of the network by the supervisor is also allowing further modification and augmentation of the popular areas.

This project has been described at a number of health care gatherings around Australia and Internationally and it has not only met with great enthusiasm but also with a strong desire for participation in the system by many health care workers.

Now that the project leaders have demonstrated the success of the network and identified the areas of prime interest, membership of the network is offered to all health care workers in Australia. It is believed that such potential users will not need to have any degree of computer literacy, or even computer interest, in order to derive benefit from using the ultimate system.

References

Committee of Inquiry into Medical Education and Medical Workforce, (Chairman: Doherty R.). Australian Medical Education and Workforce into the 21st Century, Commonwealth of Australia, 1988.

Piterman L. A Study of Final Year Medical Students', Interns', Junior Resident Medical Officers' and Senior Resident Medical Officers' Perceptions of Rural Training and Practice in Victoria (1988), Monash University publication, 1989.

Blainey G. Tyranny of Distance, Sun Books, 1966.

Mason S. NHS Family Practitioner Service Data Communications Strategy, In: MEDINFO 89. Barber B,Cao D, Qin D, Wagner G (eds). Amsterdam:North-Holland, 1989:1104-1107.

Meeks K B. KARENET: Developing a Multitiered Network for Rural Health Care Delivery, In:MEDINFO 86. Salamon R, Blum B Jorgensen M (eds). Elsevier Science Publishers B.V. (North-Holland), 1986:358-360