MEDICAL PRACTICE

Contemporary Themes

Use of personal computers in a teaching hospital in Zambia

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Introduction

Computers are playing an increasingly important part in the practice of medicine, particularly in developed countries.¹ They may be used for storing and analysing data, secretarial work, and administration. Computers are used in both hospital and general practice and are often large, powerful, and expensive models that would be inappropriate in the Third World. This is particularly true where there is a lack of trained technicians locally to maintain both hardware and software. Consequently the potential for using computers in medicine in Third World countries has not been developed.

Recent reductions in the costs of buying and running microcomputers meant that it became possible to consider using them more in medical practice, and "user friendly" software made them particularly suitable for use in hospitals in the Third World. For the past year we have used two microcomputers in the departments of surgery, intensive care, and anaesthesia in this hospital. The cost of equipping a department with a microcomputer is about £400, a sum that compares favourably with the cost of just one or two items of software for a more powerful and expensive main frame computer. Neither of us had any experience of using computers before buying them, and we learnt everything from standard instruction books and by trial and error.

Experience

We both imported microcomputers when we came to Zambia and for the past year they have been in daily use. The programs we use are listed in table

I together with the estimated price, although other suitable programs are also available.

Word processing—For the Amstrad we use the Locoscript program that was supplied with the computer, and for the BBC we use the View or Wordwise programs, which cost £40. There were problems in the hospital owing to lack of secretarial help and copying facilities; the word processing programs has compensated for these shortcomings. The range of tasks for which we use them includes writing letters and reports, compiling examination papers, drafting research proformas and lecture notes, compiling forms for clinical observations and designing wall posters. The ability to print many copies of a document has proved particularly useful. The quality of print obtained from dot matrix printers is adequate, although daisy wheel printers with better quality typefaces are available. Both computers have been used to facilitate the organisation of conferences on intensive care and on anaesthesia, each with over 50 delegates. Personal programmes and letters were designed and sent out, name badges were printed, accounts detailed, and original papers typed and recorded in the memory so that they could be edited before publication in the society's annals. The principles of word processing were easy to grasp, and the ability to correct spelling mistakes on the screen is useful for non-typists. For those who cannot spell programs for checking spelling are available, costing £15-£30.

Information storage and retrieval database—For the Amstrad we use the Datastore program, which cost £40, and for the BBC we use Masterfile II, which cost £22. Details of at least 700 patients admitted annually to the intensive care unit are entered on a database for evaluation of a clinical severity scoring system and so that data on particular patients can be retrieved easily. Details of patients anaesthetised are also stored for audit and research purposes.

Statistical analysis—For the Amstrad we use the Oxstat program, which cost £100, and for the BBC we use a program devised by S Nixon, senior lecturer in surgery at the University of Edinburgh. These programs comprise several statistical analyses including standard parametric and non-parametric tests, analysis of variance, and multilinear regression. We have found these programs particularly useful for analysing data for publication in scientific papers. Database programs are available that can be used in conjunction with the statistics program. There are also programs that produce graphs accurate enough for publication. We use the BBC Viewplot costing £20 and the Amstrad Cracker 2 costing £45.

Clinical slides—We use a BBC program devised by Mr S Nixon, with which it is possible to design a clinical slide on a colour monitor and then photograph it. When facilities are not available for processing normal films Polaroid transparencies may be used.

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Marking examination papers—A program was written for us by Mr M Bennett, of the department of computing at the University of Zambia, which improved the speed and accuracy with which we mark multiple choice examination papers. The correct answers are typed into the computer followed by the students' responses. The papers of 50 candidates each answering 500 true/false questions are marked in three to four hours. The class's performance is analysed for each question so that subjects about which knowledge is below standard and bad questions can be identified. By storing banks of questions for examinations we can select questions rapidly and print the examination papers for the following year.

TABLE I—Computers in use at University Teaching Hospital, Lusaka

Computer model	Cost excluding value added tax	Disk drives	Dot matrix printer	Daisy wheel printer	Monitor
Amstrad 8256	£299	1	Included	Over £200†	Green, included
Amstrad 8512	£399	2	Included	Over £200†	Green, included
Amstrad 9512	£499	2	Over £150†	Included	White, included
BBC model B*	£400	Over £100† each	Over £150†	Over £150†	Colour—over £200 Green—over £100

*Current model=BBC Master compact (cost including 2 disk drives £539 including value added tax).

†Prices vary depending on specification.

Importing a personal computer

In many developing countries imported computers may be subject to an exorbitant amount of duty. It is often possible, however, to import one free of duty when starting in a post. In some countries medical equipment that has been donated may be imported free of duty, and this may include apparatus for use for research or processing of data. Regulations vary from one country to another and it is essential to check at the relevant High Commission or embassy before importing a computer. Value added tax is not charged on computers being exported from the United Kingdom, although holders of British passports may have to pay the tax initially and reclaim it when the computer has been exported.

Although the ability to type is an advantage when using a computer word processor, the skill can quickly be mastered with computerised typing tutors that cost £15 to £25. We did not require a voltage stabiliser in Zambia, though this may be necessary in other countries. When importing a computer an adequate number of disks and ribbons should be included as they can be extremely expensive if bought locally (table II). Outside the

TABLE II—Estimated expenditure for each computer

Item	Annual requirements	Cost*
Paper	2000 Sheets of continuous stationery	£20
Printer ribbons	1-2 For each 1000 pages	£5 each (new) £2 each (re-inked)
Disks	5 inch 10	£15
	3 inch 10	£25

*Outside Britain costs may be increased by import taxes.

United Kingdom supplies of disks, paper, and ribbons for the printer are variable so it is worth building up a stock of these when they are available. Retailers' prices vary widely, and it may be cheaper to buy by mail order. If you have any problems with your computer advice may be available locally through a computer club or the local university computing department.

It is worth trying to obtain insurance in the United Kingdom (Hadley Cannon Ltd provides a suitable policy) that will cover replacement if the computer is stolen. Many currencies are rapidly devaluing, so that insurance paid in the local currency may be worth only a fraction of the replacement cost of the computer.

A great deal of educational software is available for microcomputers, and the BBC model is used in many British schools. Because education of children is often a matter of concern when taking a post in the Third World, owning a microcomputer may help parents to ensure that their children are not at a disadvantage.

Future applications

In many developing countries books of all kinds are scarce. As the use of personal computers increases a vast amount of material could be stored on

disk and processed by microcomputers to be shared by people working overseas. It would be possible to exchange information such as articles, tutorials, and computer based textbooks, which could be stored on disk and sent by post or by a modem and printed at the destination. We sent a locally written handbook on anaesthesia to a colleague in west Africa, who edited the text to make it suitable for his department before printing it himself. Computer assisted lessons on topics relevant to developing countries would be useful, and we would be interested to hear from doctors in other countries so that channels of communication using information on disk can be established.

Conclusion

Personal computers are useful because they enable doctors to teach and write in countries in which medical and administrative manpower is limited. The effectiveness of many doctors in the Third World could be increased if they had access to microcomputers. We have found the Amstrad and BBC microcomputers cost effective and urge any doctors planning to work in a developing country where research or administration will be part of their job to take a computer with them. They should not be put off if they know nothing about computers; they are not difficult to use.

Reference

1 Astbury AJ. *ABC of computing*. London: British Medical Journal, 1983.

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MATERIA NON MEDICA

Postman's knock

Although childhood is a fast receding memory, I retain a boyhood excitement at receiving and sorting the morning mail. The sound of the post on the doormat is sufficient to extract me from my bed and set me stumbling downstairs to the front door. A quarter of a century of pharmaceutical propaganda and accounts to be settled have not extinguished entirely the thought that one day something truly unexpected and highly desirable would appear by courtesy of the Royal Mail.

Recently literature from the drug houses has diminished and been replaced by solicitations to purchase everything from underwear to life insurance. Many of these communications are accompanied by some eye catching pamphlet offering the chance of a "top of the range motor car, villa on the Costa Somewhere for life, or merely a fortune" so long as the appropriate form is returned. The small print usually says that it is not necessary to purchase any goods, life insurance, etc, to participate in the competition. So I do, thus no doubt ensuring the continuity of this element of the morning mail. My first prize has not yet arrived but recently I thought my luck had changed.

"Dear Dr MRCP," the gaudy leaflet began—and continued to tell me that I and the whole MRCP family of Newport could soon be enjoying a trip on Concorde or a luxury cruise. Was my name on the list of possible winners? Sure enough, "Dr MRCP of Newport" appeared. And now I have a problem. How do I sign my reply? I had worried how I should maintain my anonymity when the big prize came my way. After all I would not want my patients to know I had obtained my new car in an underwear competition. I will seek the help of my friend on the GMC with this tricky question. Meanwhile I wonder what tomorrow's post will bring.—DAVID W HIDE, consultant paediatrician, Isle of Wight.