Medicine and Computers

A viewdata system for poisons information

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In 1963 poisons information centres were established in Belfast, Cardiff, Edinburgh, and London "to give urgent information about the content of substances in common use which may give rise to acute poisoning, and to help doctors in providing effective treatment in cases of poisoning." They have since provided a daily, 24 hour a day telephone answering service. The annual number of inquiries has risen over the years, and in 1979 a total of 38 426 were answered.¹ The volume of information required to answer inquiries has also increased concomitantly, and the problems of storage and retrieval and, more importantly, of updating have become formidable. Moreover, only the London centre has sufficient staff to provide a round-the-clock service as their sole function. We have therefore transferred the poisons information to a computer-based system to ease storage, retrieval, and updating and by using viewdata technology hope that in time most inquiries will be dealt with directly by the computer.

The problems

WORK LOAD

The annual number of inquiries to the Scottish Poisons Information Bureau rose from 83 in the last quarter of 1963 to 4058 in 1975.^{2,3} The numbers then remained fairly steady until 1981, when they increased further to 5411, a 28% increase on 1980. At that time 66% of calls came from hospitals, 30% from general practitioners, and 4% from other sources including drug information pharmacists and veterinary surgeons. This distribution has remained fairly constant over the years.³

Inquiries are received throughout the day, and analysis of consecutive calls in randomly selected periods in 1974, 1978, and 1981 shows that only 36-40% occur during the normal working week (0900-1700, Monday-Friday) (table). Each caller is given the opportunity to discuss his problem with a member of the medical staff of the Regional Poisoning Treatment Centre and about 20% do so (table).

Distribution of calls to the Scottish Poisons Information Bureau

Calls	Oct-Nov 1974	Dec 1979- Feb 1980	May 1981
No of calls	563	857	542
% In working week	40	36	36
% Out of hours Mon-Fri	33	37	37
% Weekends	27	27	27
% Referred to medical staff	9	22	16

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STAFFING

The bureau has only one member of staff, an information officer who answers inquiries during normal office hours. At all other times including weekends, public holidays, and the absence of the information officer on holiday most calls are answered initially by members of the nursing staff of the Regional Poisoning Treatment Centre. Medical staff with extensive experience of clinical toxicology are always on call to provide help if required.

STORAGE AND RETRIEVAL OF INFORMATION

The same system of information storage and retrieval has been used since the inception of the service. The product name, its ingredients, physical characteristics, package size(s), name and address of manufacturers, possible fatal dose, and the features and treatment of poisoning are typed on one side of a standard sheet of paper measuring 23 × 15 cm that is filed alphabetically according to product name in large ledgers (Kalamazoo Visible Binders). The entries are prepared by the staff of the National Poisons Information Service at Guy's Hospital, London, and circulated to each of the other services.

Simplicity is the great virtue of this system. Nevertheless, it has several major disadvantages.

(1) There are now 16 bulky (42 × 32 × 8 cm) and heavy (mean weight 6.4 kg) binders.

(2) To reduce cross-referencing to a minimum, there is considerable duplication of information.

(3) In some instances the amount of information is greater than can be clearly presented within the constraints imposed by the format of the standard register entry.

(4) It is difficult to indicate the points that should be emphasised by the person answering the inquiry.

(5) The most serious criticism is that there is no index of products according to principal ingredient or toxic effect, so that efficient and comprehensive updating of information is well-nigh impossible.

A solution

A computer-based information storage and retrieval system seemed the obvious solution and would permit rapid cross-referencing. Thus all products containing the same substance or causing similar effects can be cross-related to a single entry for clinical features and treatment. Conversely, updating of one entry on features and treatment effectively updates the information on all products with which it is cross-referenced. A private viewdata system was chosen.

WHAT IS VIEWDATA?

Viewdata is an electronic information system invented by British Telecom, the developers of PRESTEL, the world's first public viewdata service. Viewdata systems use modified television sets as computer terminals and link them to computer databanks through national telephone networks (fig 1). It is thereby possible to have one or, at most, a small number of computers supplying information for the whole of the United Kingdom. After confirming the identity of the user, the computer offers various numbered choices on the television

screen. The user then presses the number appropriate to his choice (one or two digits) on a simple key-pad (fig 2) that is connected to the back of the television set. This causes new information or further choices, or both, to appear on the screen. Usually, only a few steps are required to arrive at the desired information and, with experience, short cuts are possible.

FIG 1—Modified television sets as computer terminals linked to computer databanks through national telephone network.

FIG 2—Simple key-pad that is connected to the back of the television set.

THE HARDWARE

The Scottish Poisons Information Bureau computer is an Incotel private viewdata system supplied by Honeywell Information Systems Ltd. This consists of a mini-computer with 128 k bytes of main memory and 40 megabytes of hard disc backing store. Currently, up to seven users may have access to the computer simultaneously by telephone lines, but this number can be expanded to 35 if required.

Advantages of viewdata

All computer-based systems for storage and retrieval of information are capable of very rapid cross-referencing and are therefore much easier to update than paper files. Many would be suitable for poisons information, but viewdata offers facilities and advantages not readily available with other systems.

ADVANTAGES TO THE USER

Since the computer terminal is a colour television set, viewdata is attractive and very simple to use with a key-pad that has a small number of keys (fig 2). The user can be as fast or slow as he wishes in reading the information and can return to previous screens of information if required.

High-quality relatively inexpensive viewdata television sets are already being marketed, and the public has been introduced to viewdata in the form of PRESTEL.

The telephone links to the computer already exist from every hospital and many homes, and the viewdata user only has to have a jack-socket installed by British Telecom to connect the television set to the telephone network. It is also possible, but less satisfactory, to adapt an ordinary domestic television set for viewdata as shown in the lower half of fig 1.

ADVANTAGES TO POISONS INFORMATION SERVICES

The major potential advantage of viewdata to the poisons information services is that in time hospitals that consult them frequently may purchase or rent their own viewdata television sets to obtain information directly from the computer. This will not only relieve nursing and other staff from the burden of having to answer so many calls out-of-hours but will give experienced staff more time to improve and update the service. At present about 80% of calls are answered simply by reading the appropriate poisons register entry. We believe that the same information transmitted to a colour television set will be even more informative, since the use of colour and the ability to make certain words flash intermittently can be used to emphasise important points that might not otherwise be apparent. The new system should also eliminate communication errors. Another advantage is that the amount of information presented is no longer limited by the dimensions of a typed page since it may be spread over as many screens as are required.

The use of a computer-based system is also advantageous from an administrative viewpoint. It is possible to monitor the number of occasions on which information on particular products is consulted and in time this will be valuable in deciding which items of information could be deleted. Such detailed monitoring has not been possible to date and as a consequence little has been deleted. Though poisoning is occasionally due to substances that have lain around homes unused for many years, the current registers undoubtedly contain information on obsolete products that could be removed. Equally, the new system will be of value in monitoring the number of inquiries about newly marketed products.

PROTECTION OF CONFIDENTIAL INFORMATION

Manufacturers voluntarily provide poisons information services with detailed lists of the ingredients of their products, and it is vital to maintain the confidentiality of this information so far as possible. The viewdata system being developed by the Scottish Poisons Information Bureau protects information in several ways. Not only must the inquirer have a viewdata television set or adaptor but the unique 10-digit number embedded in it must be registered with the poisons information computer before the computer will answer the call. The unit or individual making an inquiry must then give a password to gain access to any information. Registration of sets and passwords will be at the discretion of the director of the service.

Confidential information may be further protected by giving it a security rating between 0 and 9 while the level to which individual users have access is determined on the same scale. Users with the lowest security rating will always be given sufficient broad information about the principal ingredient(s) of commercial products to be able to manage acute poisoning confidently. On the relatively infrequent occasions, however, when patients are very ill and detailed information may be required, clinicians will have to discuss the problem directly with poisons information staff who have a higher security rating.

Comment

The increasing work load and inadequate staffing of the Scottish Poisons Information Bureau were the principal motives for finding a new way of providing poisons information. The work load could not be absorbed by other United Kingdom

centres, and an increase in staff to eliminate the need for nurses to answer the telephone was clearly not justified by the number of calls nor realistic in the present economic climate.

The development of a private viewdata system potentially places poisons information in every hospital, health centre, or surgery around the clock without having to finance the number of staff to provide an independent telephone answering service of the current type or compromising the confidentiality of information given by manufacturers. Unlike PRESTEL, there are no charges for information viewed or computer time. Standard telephone charges are the only costs additional to the initial outlay for equipment and connections. Obviously not every doctor will feel the expenditure on a special television set justified, and the present service will always be necessary, although we hope on a much reduced scale. Viewdata, however, is at an early stage of development and is almost certain to become much more widely used for medical purposes. Some pharmaceutical companies already have information (including data sheets) about their products available on PRESTEL. Viewdata could also be used to provide drug information services and local information including the staffing and timing of clinics, availability of laboratory services, and latest circulars on specific topics and a variety of others.

The considerable difficulties entailed in comprehensively updating the extensive information on poisons already held was also a potent stimulus for the development of a computer-based system. All British poisons information services use paper or card filing systems for storing and retrieving information. In the United States a computer-generated microfiche system, Poisindex, is widely used⁴⁻⁶ but would probably not be practicable in Britain because of the number, variety, and casual involvement of some of the people answering inquiries. A more recent development is an audio cassette tape system⁷ whereby a doctor contacting the poisons centre has the appropriate cassette of information played to him over the telephone. Obviously, this is less than ideal, since he is not in a position to dictate the

rate at which the information is given and will not be able to go back to check details without requesting replay of the whole cassette. These problems do not exist with a viewdata system.

The colour and ease of use of viewdata should prove attractive to frequent users of poisons information services, and we believe that it could relieve many of the problems facing not only the Scottish, but all centres in the United Kingdom.

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Doctors who wish access to the viewdata poisons information service should contact ATP.

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Letters to a Young Doctor

More about general practice

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Not everybody will necessarily conform fully with the requirements of the regulations for becoming a principal in general practice. For some doctors the Joint Committee on Postgraduate Training for General Practice (JCPTGP) might recognise what is called "equivalent experience." It is *essential to consult the regional adviser* in general practice about this. In advising you he will have to consider the total pattern of your previous experience, wherever it may have been and in whatever subjects. Therefore, help him by writing out your full curriculum vitae before you go to see him. He can then help you by suggesting

where your previous experience may be deficient for these purposes or help you to arrange your submission to the JCPTGP. If you send your curriculum vitae to him before your visit with a letter saying what you want him to do, he will be able to give it consideration before your interview, which may be helpful to both of you.

Naturally, quite a few graduates do not decide to take up general practice until a year or two or more after full registration. They may have become disillusioned by hospital medicine or its career prospects, or they may have developed a positive interest in general practice which they did not realise they had. It will be seen that previous hospital experience may count towards obtaining the certificate of prescribed experience if it has been in one of the "compulsory" subjects. Again, there is no sensible alternative but to *consult the regional adviser*. Provide him with a curriculum vitae. He must see the total pattern of your career so that he can advise you properly. You might have

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