MEDICAL PRACTICE

Contemporary Themes

A comprehensive bibliography database using a microcomputer

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Abstract

A system was implemented using a commercial database management program and a microcomputer for computerising references from journals and other sources. In addition to the citation, the user can enter the address of the institution where the study was carried out, a description of the article and of the work, key words, and an abstract. References are added, edited, searched for, displayed on screen, typed on paper, or sent to a text file, using selection criteria entered by the user. When a search is performed the printout will include the abstract of each paper, similar to that obtained from larger bibliographic services. The computer also writes requests for reprints. This program now holds over 30 000 references and has been in use for over three years. Such a system is beneficial for personal study, for writing books, articles, and theses, and for use by institutions, departments, and small libraries.

Introduction

The large number of publications that the clinician and research and laboratory worker have to consult and recall in order to keep pace with progress in medicine and to facilitate the writing of clinical and scientific papers makes a filing and retrieval system obligatory. Manual methods which have been developed for this purpose are inadequate when the collection exceeds about 200 entries.^{1,2} It has recently been shown that some medical papers contain inaccurate quotations and citations,³ and this emphasises the need for a system which reduces these errors.

Many systems have been described for computerising references.^{2,4,5} Those which are based on mainframe computers have limited application because few clinicians and research workers

have access to such computers.² Microcomputers are more widely available and used because of their relatively low cost and the large number of programs that can be run on them. Two programs written for microcomputers have been described,^{4,5} but these and the mainframe computer based system are limited merely to storing the citation in a form that allows easy retrieval. I have developed a personal system which also enables the abstract and other data from the article to be stored and recalled and performs other functions not described for the other programs.

Methods

The computer used was the Transtec HD5 microcomputer with 64K random access memory and the CP/M (control program for microprocessors) operating system. It had an integral hard disk with a storage capacity of 5 megabytes, a built in visual display unit, and a detachable keyboard. The application program used was dBase II (by Ashton-Tate, United States of America), a relational database management program that is widely available.

The software package was specially adapted for handling bibliographical data using the incorporated structural program and editor. The final application program is menu driven, thus enabling the user with no computer training or experience to run it by simply selecting options displayed on the screen. After the computer is switched on the user invokes the program by typing the loading command, which consists of two English words chosen so that they can be remembered easily. The computer requests the password, which if entered correctly, will display the main menu (fig 1). The use of passwords is helpful because it prevents inadvertent erasure or alteration of the data and limits unauthorised use of the database. The appropriate function is performed by typing the numerals against it.

APPENDING REFERENCES

Each new reference is added to the end and is automatically given a computer number. The following data fields are used. (1) The date of entry of data. (2) Initials of person entering data. (3) Source of reference: journal (J), book (B), thesis (T), unpublished manuscript (M), other (O).⁷ (4) Location of reference: in user's own collection (U), available in user's library

(L), or other location (O). (5) Type of work and article: original study (S), review article (R), case report (C), controlled trial (T), adverse effects (A), therapy (M), clinical pharmacology (P), animal experiments (E), in vitro study (V), leading article or editorial (L), correspondence (W), other (O), or combinations of these. (6) Authors: (asterisk against the author for correspondence or reprints). (7) Address of institution where work was done. (8) Address for reprints (if different from above). (9) Title of journal or book (in full). (10) Volume number and pages. (11) Year of publication. (12) Title of paper. (13) Key words. (14) Abstract and other information the user considers useful from the paper.

The computer is programmed to accept only the relevant code or codes in the fields designed for encoded information (2 to 5 above) and only numerals in the date fields. These provide limited but useful validation and help to reduce errors in filing. The use of codes reduces data entry time. If data items are unknown or unavailable the field is left blank.

EDITING REFERENCES

A reference can be located from its number in the file or it can be searched for on one or more of its characteristics. The validation facilities provided during entry also apply to editing.

Searching for, displaying, and printing references—The search facility is

- 01 NUMBER OF REFERENCES IN FILE
- 02 APPEND REFERENCES
- 03 EDIT REFERENCES
- 04 SEARCH/DISPLAY REFERENCES
- 05 PRINT REFERENCES
- 06 SORT REFERENCES
- 07 TRANSFER REFERENCES TO TEXT
- 08 BACK UP DATA FILE
- 09 REQUEST REFERENCES
- 00 FINISH

PLEASE ENTER YOUR CHOICE: :

FIG 1—The main menu.

probably the most powerful function of this program. When the option is selected the directory (fig 2) is displayed. The fields are represented by numbers; the bottom section contains a choice of mathematical logical operations—the so called Boolean operators (and, or, not, greater than, less than, equal to, equal to or greater than, equal to or less than), which are used to define the limits of the variables entered. The reference or references required can be located by filling in some known characteristics; it is not necessary to type the whole variable, but only a string within it that enables identification. The more unique the string the fewer the number of unwanted references retrieved. For instance, if there are papers by authors called Smythe, Smethurst, and Prism, they will all be called up if the string

INPUT: SEARCH for all references on:

Key words: Campylobacter

Year: 1977 to 1983

Journal: British Medical Journal

Skirrow MB.

Campylobacter enteritis: a "new" disease.

Br Med J 1977;2:9-11.

Original study. Paper available in user's collection.

This paper describes a selective culture technique for isolating campylobacters from faeces and shows that these organisms were the commonest cause of infective diarrhoea. It describes modes of infection and the distinctive clinical features of these patients. Good introduction to the subject and useful historical references.

Lambert ME, Schofield PA, Ironside AG, Mandal BK.

Campylobacter colitis.

Br Med J 1979;1:857-859

Original study. Paper available in user's collection.

Clinical, sigmoidoscopic and histological findings are described for 11 patients who had campylobacter in their stools. The findings are similar to those in patients with ulcerative colitis, emphasising that this organism must be looked for in patients with acute colitis. Useful references.

FIG 3—Typical computer print out for command in fig 2.

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<<<<<<<<      REFERENCE FILE DIRECTORY      >>>>>>>>

01 ENTRY DATE      02 ENTRY BY      03 SOURCE OF REF      04 LOCATION OF REF
05 TYPE OF REF      06 AUTHORS      07 ADDRESS      08 JOURNAL
09 YEAR      10 KEY WORDS      11      12

SEARCH FOR:  ::=
      .AND.: ::=
      .AND.: :>:
      .AND.: :<:
      .OR.:  ::=
      .OR.:  :>:
      .AND.: :>:
      .AND.: :<:
      .OR.:  ::=
      .OR.:  :>:
      .AND.: :>:
      .AND.: :<:
      .OR.:  ::=
      .OR.:  :>:

Field names abbreviated to enhance screen layout. The user enters his criteria in the lower part of the screen. In the example given below the user wants to locate all the references on Campylobacter infections in the BMJ between 1977 and 1983.

SEARCH FOR: 10::=:CAMPYLOBACTER      .AND.: 08::=:BRITISH      .AND.: 08::=:MEDICAL JOURNAL :
      .AND.: :>:
      .AND.: :<:
      .AND.: :>:
      .AND.: :<:
      .OR.:  ::=
      .OR.:  :>:
      .OR.:  :<:
      .OR.:  :>:
      .OR.:  :<:
      .OR.:  :>:
      .OR.:  :<:
      .OR.:  :>:

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FIG 2—The file directory.

in the "Author" field is "SM"; but if only those by Smith are required, the minimum string would have to be "SMI." One important difference between database management systems and the more powerful online information retrieval systems such as MEDLINE is that the search functions of database management systems are less flexible.⁶ For instance, an online system would locate references by Thurlow if asked to search for papers by authors whose names "sound like" Fellow, but a database management system cannot. The records identified from the selection criteria entered by the user are displayed sequentially on the screen. The references and abstracts can be produced on the printer in the form of a computer print out (fig 3) similar to that obtained from larger bibliographic databases.

Sorting references—References are normally stored in the order in which they are entered. All the references, or a selected number of them, can be rearranged in numerical order of year of publication (useful in review articles) or in alphabetical order of first author's names (necessary when references are to be cited in the Harvard style).

Transferring references to a text file—Once the bibliographical database is created, checked, and found to be free of errors selected references or parts of them can be transferred to a text file, which is stored. This text file can be incorporated into other files written on a wordprocessor, thus eliminating possible typographical errors, which are common when references are transcribed from cards or other manual sources. References can be edited into the Harvard or Vancouver style as required.

Copying data files—It is advisable to make a copy of the data file when the database is created and whenever an alteration is made because of the possibility of loss of disk, accidental erasure, fire, or machine failure.

Requests for reprints—A plain postcard is placed in the printer and the code for this function (09) is entered. For each reference selected the printer will type the name and address of the author from whom reprints are obtained, and on the other side the name and address of the user, the standard request letter, and the citation. Several requests can be made at the same time and a secretary is spared the task of typing these.

SOME OPERATIONAL DATA

The present system contains over 30 000 references that I have entered personally. The program is capable of holding 65 000 records, but in practice this exceeds the storage capacity of the disk. When the disk is full the file can be continued on other disks. I have found it useful to hold data on particular subjects on separate floppy disks as this makes searches for references quicker. It takes about five minutes to enter a reference with a 150 word abstract; about 10 and 15 minutes to search through 10 000 references on one and five variables respectively; and about two minutes to copy 5000 references to another disk.

Discussion

dBase II, now well established and documented,⁷ is an example of a database management system. It is widely used for applications in which records on a particular subject are computerised and has facilities for analysing and retrieving the data. One advantage of this program over some other database management systems is that it incorporates a structural program which makes it possible for the user to create menus and to write additional codes that will instruct the computer to execute specified functions. It has been used successfully in data management in libraries for the storage of supplies, trade literature,⁸ and for producing a book index,⁹ and in clinical medicine for the storage and analysis of information on surgical workload.¹⁰

For the management of bibliographical data this program has all the advantages of the mainframe system and more utilities.² It can be used on any microcomputer with the CP/M operating system, and users who already have the database package can adapt it using the program's editor by adding the necessary "command" files. Many microcomputers such as the Apple and the BBC can be modified to run this program. Two or more users in the same or another institution can enter references from different journals and each user can copy the data from the other users. This facility is invaluable for expanding the database, but it is important for all the users to file data from references by agreed rules.

The "reference to text" function is an important advantage of this system for it allows not only citations but also abstracts to be retrieved from the database into text without changing the entries in

the source file. The references can be easily arranged into the necessary form in the recipient file. The ability to produce printouts of references and the simple way of requesting references are additional facilities.

The main disadvantage is the cost of the program, which is about £360, but this software can be readily adapted for many other filing purposes. The screen for entering selection criteria appears initially confusing but is easy to use with practice. There is modern software specifically designed for bibliographic searches, which would provide much faster response times than the present program, but it is less readily available and much more expensive.

Of all the systems previously described, some of which I have tried, I believe that this is the most useful for it provides the most utilities and can be run on a wide range of microcomputers. I recommend it as a useful tool for the easy storage and retrieval of references and abstracts for individuals and for clinical units and research establishments.

I will forward on request a listing of this program and would also give advice to users wishing to add the program to their existing microcomputer. (For program listing please send an A4 sized self addressed envelope with 36p stamp or prepaid equivalent for those overseas.)

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Accepted 10 April 1986

A patient receiving amiodarone hydrochloride developed photosensitivity after three years treatment. Although the drug was stopped she still has some photophobia. Is this usual and what treatment is advised?

Confident replies to all the points raised cannot be given owing to conflicting reports and lack of clear information on the side effects of this drug. Skin photosensitivity is a common adverse side effect of treatment with Amiodarone.^{1,2} By contrast, eye symptoms are less common. This impression seems also to be borne out by the register of adverse drug reactions of the Committee on Safety of Medicines (personal communication). In this patient it seems that the skin photosensitivity took as long as three years to appear. Assuming normal seasonal sunshine, development of photosensitivity more commonly occurs early—namely within a few months of starting treatment—unless the dose is increased during treatment. Photophobia as an isolated symptom of the adverse side effects to amiodarone seems unusual, especially if the drug had been stopped for some weeks or months. There might be a disorder of the eye itself (unrelated to the drug) or the symptom could perhaps be psychogenic. As the photophobia in the patient cited does not appear to be severe, perhaps no treatment is indicated except reassurance. Should the doctor suspect underlying eye disease, an ophthalmologist's opinion should be sought.—I A MAGNUS, professor of photobiology and G M MURPHY, senior registrar, London.

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- 2 Ferguson J, Addo HA, Jones S, Johnson BE, Frain-Bell W. A study of cutaneous photosensitivity induced by amiodarone. *Br J Dermatol* 1985;113:537-49.