Audit in practice

Computer generated prescriptions as an audit tool

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The introduction of audit and resource management into medicine is closely linked with the introduction of computerised information systems. Substance abuse is an area where data collection is often difficult and the pressures of the clinical load may cause data collection to take second place. The need for information systems should not be allowed to impose an extra load on clinical staff or the effects of introduction can have severe negative consequences on units (McLean & Kaplan, 1983).

The computer system described here uses computer generation of methadone prescriptions as an audit tool, enabling the clinician to generate controlled drug prescriptions for methadone clinics while collecting data for audit and management use. The system has been in use since 1989 and has been developed and modified to respond to the clinical needs of the unit.

Background on computer generation of CD scripts

The generation of prescriptions for controlled drugs (CD) is subject to legislation and systems must conform to a set of guidelines (British National Formulary, 1991; Dept of Health, 1989).

(1) Computer generation of CD prescriptions is only legal if the prescriber has a handwriting exemption (or the prescription is for phenobarbitone only). A handwriting exemption is obtained by application to the Home Office under the provisions of Regulation 15(2) of the Misuse of Drugs Regulations 1985. Doctors working in drug dependency clinics who issue more than ten prescriptions a week should meet the requirements for exemption.
(2) Prescriptions must be signed and dated in the prescriber's handwriting – a computer generated date is not acceptable, although it may be printed on the prescription if the date is also handwritten.
(3) The prescription must conform to the requirements of the Misuse of Drugs Regulations (1985) in containing the following details:

   (a) surname, forename and address
   (b) form and strength of the preparation
   (c) the dose
   (d) the total quantity of the preparation or number of dose units in both words and figures
   (e) if the prescription is to be dispensed in instalments, the quantity of each instalment and the interval to be observed must be specified.

In addition to the requirements for controlled drug prescriptions, the prescription production system must conform to the general requirements for computer issued preparations.

   (a) The doctor's name and clinic address and reference number should be printed at the bottom of the prescription.
   (b) Names of medicines must come from a dictionary held in the computer memory.
   (c) The computer may contain information on the usual doses and formulations to produce standard predetermined prescriptions.
   (d) The prescription details must be printed in full although the information may be stored in a coded format.
   (e) Numbers and codes used in the system for organisation and retrieval of data must not appear on the prescription.
   (f) A mechanism should be incorporated to cancel unused space or the doctor should delete such space manually.

It is an offence to issue or dispense a prescription which does not comply with the detailed requirements of the Misuse of Drugs Act.

Management information systems in substance abuse

The need for information systems in substance abuse was recognised in the late 1970s when Zalkind *et al* (1979) discussed the principles of establishing information systems in drug treatment organisations. The authors note that interest in information systems often generates a demand for large and expensive computer systems when what is really required is a methodology to determine what information is needed to influence operational management decisions and treatment programme evaluation.

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Wood & Youatt (1979) described a computer database management and information retrieval system for clinical research on patients being treated with levoalpha-acetylmethadol (LAAM) which analysed information on urine and blood tests, medication records, patient reported drug use and clinical information collected by research staff. The system used this information to produce monthly reports on patient opiate use, termination of treatment and LAAM dosage as well as combined reports assessing the influence of LAAM dosage on heroin use. The information was output as tables and graphical representations of data. Although designed as a research tool, this system met the needs of clinic staff for feedback on evaluation of service provision.

Description of system

The audit system installed at the Substance Abuse Unit consists of a networked series of 4 AT compatible computers with 20 or 40 Megabyte hard disks running Dbase IV database software. Printing facilities are either local to dot matrix printers or through the print spooler to a laser printer. The prescriptions are printed on a Panasonic KX-P4450 laser printer.

Database

The prescription generator uses a Dbase IV database system using relational databases. This allows flexible use of the stored data and avoids duplication of data input. The databases were designed to collect data as a function of clinical and administrative use including prescription writing and Home Office Notification.

The computer system runs through a simple menu of options and the data for the prescriptions and for any changes in prescribing are input by the doctor running the methadone clinic.

Security for the system is provided by locking computer rooms, locking computer keyboards when not in use, a network log-in code and user name and a second log-in name and code for the prescription generation programs. These precautions, combined with the split data structure, afford greater security than a traditional paper based system.

Data from the database are stored on one central hard disk on the network and are automatically backed up onto high speed tape archive on a daily basis. Data loss is therefore confined to the last 24 hours entries. Paper printouts of prescription lists at the time of prescription generation allow easy back-up of any lost data.

Script generation

The prescription-writing module of the system is designed to print onto standard FP 10(HP) (ad) prescription forms. The programme prints surname,

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METHADONE    20   MG DAILY
AS  20  MLS METHADONE  MIXTURE [1mg/1ml]
Dispense   1  days supply  25/09/89
Dispense   1  days supply  26/09/89
Dispense   1  days supply  27/09/89
Dispense   1  days supply  28/09/89
Dispense   1  days supply  29/09/89
Dispense   2  days supply  30/09/89
Total amount to dispense   140  milligrams
( One  HUNDRED  AND  FORTY   mg)
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Fig. 1. Computer generated prescription.

forename and address and then goes on to generate the prescription (Fig 1).

The details of the prescription are held in a file. Each patient's prescription details are identified by hospital number and the date on which the prescription is to start. The daily dose of methadone is stored with the number of days to be dispensed and the form (1/1 or 2/5), the file also holds a code which denotes the frequency with which the instalments are to be dispensed: weekly, daily, or on various split day patterns.

If the prescription is a postal prescription the date for posting is also recorded.

From the information contained in this file the computer prints out the dose and form of the methadone and the prescription instalment details, automatically adjusting for Sundays or Bank Holidays.

The total amount to be dispensed is then printed in figures; the computer converts this to words and prints this below before blocking out the remainder of any blank lines with dense overprinting.

The prescribing centre address and reference number are then printed leaving the prescription to be checked, dated and signed by the clinic doctor.

Prescriptions may be printed either for a single named patient or in a batch mode by date of prescription pick up or date to dispense.

A paper copy of the details of prescriptions dispensed is printed out for each days' prescriptions. This is used as a record of prescriptions dispensed by prescription number but also generates statistics such as mean daily methadone dose and maximum and minimum doses, together with prescribing costs. Individual dispensing details are recorded in a computer archive file which can be accessed to look at longitudinal changes in prescriptions for individual patients.

Urine results

Testing of urine for drugs is an essential part of the methadone clinic and this is linked into the computer

system. Results of the urine screening are collected by the computer either from manual input or by direct computer connection between the computer system and the Syva ETS drug analysis machine. Results are stored by date and patient number and can be recalled either as a chronological record of test results or as overall rates of positive test fractions by patient or by defined patient groupings. The test results are available over the computer network both to the ward staff running the testing service and to the doctor through the methadone programme. A separate executive data module allows access to overall statistics for audit purposes.

Home office notification

Notification of addicts to the Home Office Register has been through the computer system since 1989 following an agreement with the Home Office to accept our computer generated notification forms in lieu of the official forms. Data for the forms is collected from the patient database and the notifying doctor is prompted for information required for notification by the form generation program. The collection of information for audit and research is thus completed painlessly by rewarding the doctor who inputs the information with a ready completed notification form. A modification to the program will allow notification to the Regional Drugs Database system once this is implemented in this region.

Audit output

A series of reports and graphical summaries of the stored information allows unit staff to review patient progress on an individual basis and to view summaries of information related to the patient population as a whole. Basic statistics include:

(a) number of patients on methadone
(b) age/sex details of patient group
(c) prescribing costs of each methadone clinic
(d) chronological details of patient's methadone dosage
(e) mean, maximum and minimum methadone doses
(f) urine testing results as % + opiates/methadone
(g) chronological details of urine testing
(h) outcome of patients stopping methadone
(i) Home Office/Regional Database notification figures
(j) complex searches of any combination of parameters.

Audit results

The accumulated results from the database have been used as the focus for an internal audit review meeting involving all unit staff. Changes in practice which have resulted from this audit process include the production of a protocol for regular clinical review of patients on the methadone programme. This review mechanism is now triggered from the computer system and routine review intervals are overridden if the system detects a series of positive urine opiate or negative methadone tests which are outside the protocol parameters.

A regular printout of all patients being prescribed over 60 mg of methadone a day is distributed to all doctors working in the unit and an audit project is now assessing whether this feedback alters prescribing patterns for higher methadone dosages.

Conclusions

(a) The value of a computerised methadone clinic extends beyond saving clinician time and can be used as a focus for collection of information for audit and research.
(b) To avoid the development of idiosyncratic "information islands", a national standard for such systems should be devised and appropriate support for such systems in the form of computer friendly prescription forms should be developed.
(c) Linking such systems with regional database information provision will enable a national interchange of information on prescribing of methadone to allow evaluation of varying prescribing practices measured against defined outcome measures.
(d) Central funding for the development of a package for use in methadone clinics would enable the production of a free software system for distribution to drug units, facilitating the uptake of such a standardised system on a national basis.

References

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