gaining access, to deliberate attempts to breech security. Mindful of this potential threat to our research data our Department undertook to test our computer security by challenging a hacker to gain access to our files.

Our chosen hacker works in the University Computing Unit and has considerable experience with our type of computer and of protecting files against unauthorized access. Our hacker gave an undertaking not to disclose any personal information which he obtained during the course of the study.

Following an invitation from us the hacker attempted to 'access' and read the information stored on our files using a University mainframe terminal. The timing of this exercise was carried out without prior arrangement. After a first casual browse our hacker than used his privileges as a member of the computing staff to access and examine any file of his choosing. Our hacker than submitted a confidential report on our departmental computer security.

The first part of the report indicated that our hacker was able to obtain some computer file names and to guess their purpose but he was unable to obtain access to their contents. At this stage he did not seek to override protection by passwords. In the second part of the report our hacker, using his privileges, was able to look at all the files and their contents but was unable to identify individuals, or to interpret the data relating to them. The report then outlined suggestions for additional safeguards.

The patient information held would appear to be relatively safe from hacking, even by wreckers. We have subsequently added additional security programmes to make access even more difficult. Following his search the computer expert was able to give us professional advice on how best to do this. One suggestion was to protect the programme for processing data and thus prevent unauthorized users obtaining computer file names and guessing their purpose. This protection would prevent someone accidentally seeing file titles and thus being tempted to access file contents.

Perhaps other clinical and research departments might try inviting a friendly hacker to test their computer security systems. The ability to maintain confidentiality of patient information stored on computer is an essential prerequisite for maintaining research standards and ultimately patient care.

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Small computers can be useful in large practices

Sir,

It has been claimed by some computer experts, not least the College's ICI Research Fellow, Dr Norman Stoddart, that home computers are inadequate for the tasks demanded of large general practices.[1] Our practice has found that this is not the case, as our experience over the past year shows.

In April 1985 our practice acquired a computer for the sole purpose of repeat prescribing. Although we are a large group practice of 10 partners looking after 22 500 patients, we decided on a small system for this single purpose as an inexpensive introduction to general practice computing. We chose a BBC 'B' microcomputer with a dual disc drive and dot matrix printer, using the 'G and G' software for repeat prescribing.

The practice is run from two separate surgeries and the computer is used at one surgery only where six doctors look after 14 500 patients. After collecting carbon copies of all our repeat prescriptions over a seven-week period, we calculated that about 2000 patients received repeat prescriptions, which meant that all the patients' details could be stored on one floppy disc. Initially a drug formulary was constructed using the *British national formulary* and with the agreement of each partner. The drug names in our formulary are predominantly generic names and the tear-off portion of the FP 10(comp) is used as a repeat prescription card, issued to the patient in a plastic wallet.

The program has excellent search facilities which make it possible to identify patients who are receiving various drugs by age and sex, so acting as a limited disease register for conditions such as diabetes, epilepsy, hypertension and myxoedema. This has provided useful material for clinical audit and trainee projects.

The BBC Subgroup of the Primary Health Care Specialist Group has been helpful in providing free software and we have found the trainee assessment programs especially useful. We have also utilized some of the commercial programs available for the BBC microcomputer. One is a general purpose data base which serves admirably as a cervical smear call and recall system, linking up with the in-built word processor to produce standard letters and address labels. Another program is used to construct graphs, bar charts and pie charts displaying statistics of consultation rates, immunization uptakes, births and deaths, referrals, night visits and so on, for inclusion in our practice annual report.

I have been delighted by the versatility of the BBC microcomputer and the total cost of our system, including software, was only £1500 or £83 per partner after tax relief. There are disadvantages, of course, compared with larger systems but I feel that home computers are an excellent first step for practitioners who are unsure about the benefits, and are wary of the cost of computerization. The relatively inexpensive experience that they offer will enable doctors to make informed decisions when stepping up to integrated systems.

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Reference

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Plasma fibrinogen in a diabetic population

Sir,

The recent paper by Stone and Thorp (December *Journal,* pp. 565-569) provides further evidence from a tightly controlled prospective study that plasma fibrinogen is an independent risk factor for coronary heart disease. Its importance is equated with that of blood pressure, cigarette smoking and serum cholesterol. Patients suffering from diabetes mellitus were rightly excluded from this study as they may form a heterogeneous subgroup with other risk factors operating. It is well known that diabetes mellitus is associated with an increased risk of coronary heart disease and this is particularly so for the non-insulin dependent patient. The explanation of this increased risk is not entirely satisfactory.

We have recently conducted a cross-sectional study of 95 male and 53 female non-insulin dependent patients from a diabetic clinic population. All the patients were assessed for the presence of macrovascular disease (that is coronary heart disease and/or peripheral vascular disease) by means of a standardized symptoms questionnaire, a resting electrocardiogram and the measurement of ankle systolic blood pressure.

In the male group, mean plasma fibrinogen (measured by radial immuno-

diffusion) was significantly higher in those with macrovascular disease (48 patients) and this difference persisted after adjustment for age differences. In multivariate analysis the three most important independent variables associated with macrovascular disease in this male diabetic population were low-density lipoprotein cholesterol, plasma fibrinogen and age. In the smaller group of females studied, mean plasma fibrinogen was higher in those with macrovascular disease (25 patients) but the differences did not reach statistical significance.

In neither group were the indices of glycaemic control (fasting blood glucose and glycosylated haemoglobin) any higher in those with macrovascular disease. One cannot conclude from this that blood glucose has no aetiological role in vascular disease but it does illustrate the point that in order to identify those diabetic patients at particular risk of coronary heart disease and peripheral vascular disease one must be prepared to measure other variables. Just as Stone and Thorp found in their non-diabetic population, estimation of plasma fibrinogen and cholesterol may prove valuable.

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General practice in Canada

Sir,

Although general practice in Canada has many attractive features, the generalized fee for service payment system is not one of them. Rather than being a model for the College's initiative on remuneration for 'quality' as suggested by Dr P.M. Johnson (November *Journal*, p.541), it has several features that mitigate against quality and performance review.

General practice across Canada is by no means uniform. The concept of general practitioner subspecialists is rare in urban areas, but more common in remote and under-doctored rural areas. Practice in the 'office' and in hospital by family practitioners is leading certain provinces to question the very concept of the family practitioner, and to suggest his replacement by his hospital colleagues, in a system which would mirror some of the features of the practices in the USA.

A major problem with the fee for service system is that it is extremely expensive. Annual health care for a Canadian patient costs approximately two and a half times that of a British patient. Costs are escalating at an alarming rate and the system generates much unnecessary, and occasionally harmful medical treatment and investigation.

Ontario has introduced a different option of care which is the Health Service Organization (HSO), which bears remarkable resemblances to the National Health Service (NHS) in Britain in that patients register with the HSO who are paid a capitation fee. There are about 18 such organizations in Ontario, and in 1984 I had the opportunity to exchange practices with a doctor from one of them for six months. The differences in attitude and practice between the HSO and the fee for service system were instructive. It is obviously in a doctor's interest in a fee for service system to perform (and claim) for as many procedures as possible, whereas in a capitation system procedures have to have their value demonstrated. In a climate of practically universal annual medical checkups, yearly cervical smears, 100% circumcision rates and monthly well-baby checks, the HSO had to evaluate these procedures and if they were not useful had to try to educate its patients accordingly.

The HSO capitation system is much more complex and sophisticated than the NHS system. Fees are calculated on a daily basis and the amount varies depending on the patient's age and sex. If a patient registered with a HSO doctor sees another primary care doctor, the HSO doctor loses his capitation fee for that month, and so has a major incentive to be attractive, efficient and provide high quality medial care. The system permits other health professionals — nurse practitioners, social workers and counsellors to be funded by the practice.

The HSO practice where I worked looked after 10% of the local population using only 5% of the number of local doctors, and could therefore claim to be much more cost effective than the fee for service system. Apart from its high cost the other major criticism of the fee for service payment system is that it actively discourages continuing medical education. If the doctor is away on a course, not only is he not earning, he has to pay a locum who may lose his patients (the same problem arises if he is ill). The fee for service system also discourages audit and standard setting because not only do these activities not attract a fee, it is also very difficult to be objective about 'standards' where fees are involved.

The introduction of a more logical capitation system to the NHS with an efficiently computerized payment system, and perhaps negotiated weighting for different areas, would be a much more attractive option than universal fee for service which could generate an increase in the quantity of unnecessary procedures with absolutely no guarantee of improved quality of care.

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Failure of a patient participation group

Sir,

May I report our experience of a patient participation group. My partner and I planned a meeting, advertising it by means of a letter to patients and by a display board inviting patients to attend a meeting in a local school. Furthermore, we listed the areas that we thought would be worth discussion at this introductory meeting, namely: the care of children, screening the health of women, accessibility to the doctors and the reception services. We had been encouraged to do this by a 'Quality of care' evening workshop led by a Newcastle teaching practice who had clearly demonstrated the benefits of patient participation groups and whose practice list has a social class scatter similar to ours.

We were astounded that only three families expressed a wish to attend and we therefore cancelled the event. We asked ourselves why there was such a difference between our practice and the larger Newcastle teaching practice and could only come up with one factor which we postulate as a possible reason. As an urban practice we have made it a policy to accept patients who live near the surgery and because of the geography of Durham and the Belmont suburb this means that most of our patients live within two miles of the practice centre and live close to other patients of the practice. I suggest that because of this most patients have some clear understanding as to what might happen if they found themselves in a whole variety of circumstances and they quite clearly understood the way the practice worked. They reported to our receptionist that they had an ability to suggest change and be heard and thus found no need for debate.

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