

Improving drug compliance in general practice

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SUMMARY. Patients of all ages make serious mistakes with their medicines, especially if several are prescribed at once.

Taking medicines involves a great deal of physical and mental work. The best way to help patients take medicines accurately is to reduce this work by packing together all tablets taken at the same time of day. Many elderly patients have relatives who could pack their medicines in this manner.

The problem

STUDY after study has shown that patients make serious mistakes with their medicines. Schwartz and colleagues (1962) found that 59 per cent of 178 elderly outpatients in New York made errors in taking prescribed medicines, and of these 26 per cent made errors judged to be "potentially serious". Moulding and colleagues (1970) found that of 122 outpatients with tuberculosis 31 per cent took less than 70 per cent of the medicine prescribed, and 28 per cent made errors so serious they were not allowed to continue unsupervised.

Even worse results have been reported for some groups of patients. MacDonald and colleagues (1977) found that 77 per cent of 60 patients discharged from geriatric wards in Nottingham made very substantial errors. In this study the commonest type of error, "under-dosage", was recorded only if patients took less than half the prescribed amount of medicine.

Blackwell (1972) reviewed approximately 50 studies in which errors in taking prescribed medicines were measured. These involved patients with many types of illness, both acute and chronic. Between 25 per cent and

50 per cent of patients in each of the different groups studied made errors. Mattar and Yaffe (1974) reviewed surveys of paediatric patients given medicine by their parents. They concluded that in general people looked after their children slightly more carefully than themselves but still between 18 per cent and 66 per cent of the children in each of the various groups studied were given their medicines wrongly.

General practice

Most studies have involved medicines prescribed by hospital doctors. However, medicines prescribed by general practitioners are just as likely to be taken wrongly. Gatley (1968) found that of 86 patients in his practice near Liverpool approximately two thirds made mistakes. Porter (1969) measured the accuracy with which groups of his patients with particular conditions took medicines. Between 24 per cent and 71 per cent of patients in the different groups made mistakes. Drury and colleagues (1976) showed that at least 14 per cent of patients in an urban group practice made errors greater than 10 per cent. The good doctor/patient relationships often found in general practice may contribute towards compliance. Charney and colleagues (1967) found penicillin prescribed to children was taken more accurately if they and their parents were seen by their usual practitioner rather than a partner. Even so, 27 per cent of children seen by their own doctor did not take medicine accurately. Kincey and colleagues (1975) found that only 65 per cent of patients claimed to follow their general practitioner's advice completely even though 82 per cent expressed satisfaction with the consultation. Poor doctor/patient relationships are likely to lead to non-compliance but important mistakes occur even when relationships are good.

Reasons for non-compliance

Attempts have been made to find why patients fail to take medicines as prescribed ('non-compliance').

Schwartz and colleagues (1962) found poor compliance was associated with advanced age, living alone, taking several medicines at once, and general 'ability to cope' as judged by an interviewer. However, most of these associations were weak and have not been noted in other studies.

Malahy (1966), for example, studied 40 adult outpatients. Age and educational level reached were not associated with compliance. Parkin and colleagues (1976) found that in 130 patients of mean age 66 years, there was no association between compliance and age, sex, social class, educational level, or degree of social isolation. Similarly Hulka and colleagues (1975) found no association between compliance and age, sex, marital status, or occupation among 357 outpatients aged 30 to 75 years.

However, many workers have shown that the number of medicines prescribed is strongly associated with the level of compliance. Malahy (1966) found that the number of different medicines was the only variable associated with the number of errors made by adult outpatients in Ohio. Latiolais and Berry (1969) and Hulka and colleagues (1975) also found that errors increased with the number of medicines taken. Parkin and colleagues (1976) found that patients did worse not only if given more medicines but also if they needed more doses each day. Gatley (1968) noted that patients taking most doses per day erred most.

Poor compliance is chiefly associated with taking many drugs at once and taking them often, that is with *more work*. This includes both the physical work of opening and closing bottles and counting out tablets and also the mental work of remembering when each dose should be taken. This association does not in itself prove that an increased workload causes patients to make errors. It could be, for example, that patients needing most medicines are the most ill or that patients presenting with most symptoms do so for psychological reasons which themselves lead to non-compliance. However, evidence that the sheer work of taking several medicines leads to error comes from the success in improving compliance of schemes which reduce workload.

We do not have enough knowledge of the causes of non-compliance to allow us to predict whether a particular patient will make mistakes with his medicines (Porter, 1969). Moulding and colleagues (1970) found that even the doctor and nurse who knew a patient best could not consistently predict if he would take medicine accurately. Because of this it is important that doctors and other health workers use whatever means they can to monitor the performance of individual patients, for example by checking the frequency with which prescriptions are issued and by inspecting medicine bottles on visits to the home. It also follows that schemes known to be effective in helping patients take medicines accurately should be introduced for all patients.

Unsatisfactory schemes

Many schemes have been devised to help patients take their medicines. They are of two kinds—those which help patients do the same amount of work better and those which reduce workload. The former methods include practical measures such as better labelling of medicine bottles and also 'counselling', that is, giving special advice on taking medicines correctly and additional encouragement to motivate patients.

Das (1977) found that many elderly patients had physical handicaps which made medicine taking difficult. The most important of these was difficulty in reading the labels of medicine bottles, of which 65 per cent of elderly patients complained. It is obviously essential that measures to compensate for such handicaps be taken, although it is unlikely such measures will greatly improve compliance by themselves. For example, in many studies of schemes to improve compliance, typed or printed medicine labels have been used without any great success. Probably this is because patients with poor vision either get help with their medicines or transfer them to bottles of distinctive shape and size. Schwartz and colleagues (1962) found that of five severely visually handicapped patients only one made potentially serious errors.

Counselling has been shown to help in some cases. For example, Wilber and Barrow (1969) counselled patients with hypertension for two-year periods. Nurses visited them regularly at home to discuss their treatment and during this time most patients had well controlled blood pressure.

Similarly MacDonald and colleagues (1977) tested the effect of a single visit from a clinical pharmacist on elderly patients about to be discharged from geriatric wards. The visit lasted about 15 minutes. Patients were then interviewed at home and it was found that serious errors were greatly reduced though approximately half the counselled patients still made serious mistakes.

Counselling alone cannot solve the problem of non-compliance. In many trials it has been shown not to have had any effect at all (Malahy, 1966; Sackett *et al.*, 1975) and even where it helps for a time the effects of counselling do not persist for long after it is stopped. Wilber and Barrow (1969) visited patients two years after their protracted period of counselling and found most were again hypertensive. McKenney and colleagues (1973) counselled hypertensive patients every month for five months. Compliance increased and blood pressure became better controlled but six months later compliance had declined to its initial level.

Written instructions are only about as successful as verbal advice, sometimes leading to small improvements (Wandless and Davie, 1977) and sometimes having no effect (Malahy, 1966). Such instructions seem most successful for younger patients taking one medicine at a time (Sharpe and Mikeal, 1974; Ley *et al.*, 1976) but even then it is not known if this benefit persists during prolonged therapy.

Satisfactory schemes

Only schemes which reduce the work of taking medicines consistently lead to improved compliance. The more this work is reduced the higher the compliance achieved.

Mattar and Yaffe (1974) gave parents a calendar to record doses of a 10-day course of an antibiotic prescribed for their children. This reduced work only a little but saved the effort of remembering doses had been taken so they would not be omitted or taken twice. Compliance was increased from five per cent in controls to 51 per cent. Though half the families still made errors there was considerable improvement.

Linkewich and colleagues (1974) gave a similar calendar to adults who had been prescribed a 10-day course of penicillin but found that only 40 per cent actually used it. However, when similar aids were incorporated into the drug packaging so they could not be discarded, they worked much better. Compliance was greatly improved when tablets were packed in foil strips of four so that each day the patient used one strip and could easily see if he was up to date during the day. It was improved slightly more by the 'Strep-Pak' in which a whole course of tablets was packed in foil with doses marked by mealtimes and the day of the course of treatment so that again patients had a reminder. Spot checks showed that with the 'Strep-Pak' 88.5 per cent of patients made less than 10 per cent error compared with 28 per cent of patients in the control group, and 96 per cent of patients were still taking their medicine at the time of the spot check compared with 47.8 per cent of patients given tablets in bottles.

These effective aids reduce the work of taking the antibiotic considerably. They remove the work of opening and closing bottles, and shaking out tablets, and also the work of remembering which doses have been taken. The high compliance rates found with the 'Strep-Pak' are about the same as with the similarly packaged contraceptive pill (Whelan, 1974).

The need for work-reducing aids is greater among patients prescribed several medicines at once. Many of these patients already use containers such as eggcups or saucers to put out a day's supply of tablets. Drury and colleagues (1976) found 70 per cent of patients prescribed medicines for long periods used some aid. If these are filled for patients by their families they reduce workload considerably but even if filled by patients themselves they reduce memory work and the effort of opening drug bottles several times a day.

Aids of this kind have been tested. Liberman and Swartz (1972) helped an elderly lady who had been prescribed several medicines but could not manage them. They packed all tablets taken on the same day in small boxes fixed to a calendar and the patient took them accurately.

The 'dosett' is a mass-produced aid of this kind, which is widely used in Scandinavian countries. It is a plastic box with 28 compartments to hold a week's

supply of tablets. Compartments are labelled with the day of the week and the time of day and are reached by sliding covers.

The dosett helps patients even when they fill it themselves. Paasikivi (1971) found that the prothrombin levels of patients on anticoagulant therapy improved when they were given dosetts. Blackwell (1976) found counselling did not help hypertensive patients prescribed on average between three and four medicines but when they sorted their tablets into dosetts each week 90 per cent of patients were at least 95 per cent compliant compared with 48 per cent of control patients.

Although workload is the most important cause of non-compliance, it is not the only one. In individual patients unpleasant side-effects, psychiatric problems, or even advice from friends plays a part. However, reduction in workload helps patients so effectively that such factors must usually be of lesser importance and pre-occupation with them should not delay the introduction of dispensing aids.

Practical problems

Unfortunately most patients prescribed several medicines are elderly and unable to fill their own dispensing aids reliably. Furthermore, even if filled for them the dosett is rarely suitable for the elderly (Flatberg, 1969; Das, 1977). It is easy to pull its sliding strips too far and spill tablets. If it is dropped all its contents may be lost. Other similar devices tested so far have been as unsuitable for the elderly as the dosett and the 'pill wheel' actually made the compliance of elderly patients worse (MacDonald *et al.*, 1977).

Klauer (1978) suggested a practical solution would be for all tablets to be dispensed in calendar packages like the contraceptive pill. The work of taking several medicines would be reduced considerably though not as much as with the dosett. Compliance of younger adults would probably therefore not be as high as with the dosett but more elderly patients might be able to cope.

However, it would not be difficult to find aids simple and rugged enough to extend the benefits of the dosett to the elderly. One possibility is to give tablets in envelopes marked with the day of the week and the meal with which they should be taken. Patients would tear them open, take whatever combination of tablets they contained, and throw them away. These would have many advantages. They are strong yet cheap, they can be carried conveniently when away from home, and the lettering on even small envelopes could be large enough for patients with poor eyesight.

Equally important would be to find someone to fill whatever envelopes or packets are chosen. Ideally this would be the pharmacist dispensing the prescription. He would need machinery to sort tablets into dispensing aids but this is not technically difficult. Skaggs (1976) described how even liquid medicines can be packaged in unit dose form.

The mechanization of even one pharmacy in each district would be expensive. However the NHS now spends £500 million each year on medicines prescribed to outpatients and since probably more than a quarter are taken wrongly such a scheme might quickly prove cost-effective.

Responsibility

Doctors are responsible for the whole of their patients' treatments and it is for them to ensure that the medicines they prescribe are packed in the best possible manner. At present pharmacists do not have the facilities to fill dispensing aids mechanically, nor have doctors the time to fill them by hand. Nevertheless, other solutions are possible and nothing need delay the introduction of aids, at least for those groups of patients most likely to make serious mistakes.

In a London group practice of about 6,500 patients, 64 patients aged 65 years or older were regularly prescribed three or more medicines. Approximately 95 per cent of medicines prescribed to these patients were tablets so that even schemes which only helped them take tablets would be useful. Sixty-two agreed to be interviewed. Of these, 51 were independent with their medicines and at high risk of making mistakes. However, 28 were visited regularly by a younger relative who could fill a dispensing aid for them. Other patients could be helped by neighbours or volunteers.

It has been recent practice for medicines given to outpatients for any length of time to be prescribed by general practitioners. Because of this and because of our pattern of primary care family doctors in this country are ideally placed to involve families and neighbours in helping find the most suitable dispensing aids for individual patients and in filling them.

We know that tablets dispensed in little bottles are not taken accurately. Perhaps we should place such bottles beside leech jars on museum shelves.

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Addendum

Reprints are available from Dr J. M. Graham at the Department of Health and Social Security, Eileen House, 8094 Newington Causeway, London SE1 6EF.