The epidemiology of prescribing in an urban general practice

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SUMMARY. The total prescribing in an urban general practice was recorded over a six-month period and classified according to the length of time that drugs were continued. The number of patients receiving any prescription rose with age, as did the total number of items per patient prescribed for; while the continued items rose with age, the number of items prescribed once only per patient remained constant in all age groups. The bulk of the total prescribing was for the elderly and this was mainly for continued items. The classification also shows that certain drug groups are liable to be continued whereas others are virtually always prescribed once only. The implications of these findings for self-audit of prescribing and the care of the elderly in general practice are discussed.

Introduction

IT has long been recognized that prescribing, far from being simply a transaction involving pharmaceutical currency, is a highly complex phenomenon involving doctor, patient and drug. Many important reviews of the subject have been written (Taylor, 1978; Howie, 1979), multicentre studies have been mounted (Parish *et al.*, 1976; Skegg *et al.*, 1977), self-audit groups have been set up both on an individual (Sheldon, 1979) and a group basis (Reilly and Patten, 1978), yet still our understanding of the subject is far from complete.

Perhaps one reason for the lack of understanding is that, in all these studies and reviews, prescribing is seen to be a uniform activity and the solution to the problems of prescribing is therefore uniform. This paper describes an analysis of six months' prescribing in an urban general practice based on the observation that the prescribing act may be an *initiation* of treatment which is normally the logical therapeutic response by the doctor to a patient's problem or diagnosis, or it may be a *continuation* of a drug, often prescribed for years, often against the doctor's better judgement and at the request or demand of the patient. The analysis was an attempt to see if these prescribing activities differed in their age and sex incidence or in the drug groups prescribed.

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Method

All prescriptions written in the Medical School Teaching Practice, Dundee between 1 October 1977 and 31 March 1978 were duplicated. This is an urban practice with the age and sex distribution at 31 December 1977 as shown in Figure 1. All the prescriptions recorded were written by three doctors working in the practice, which had been a single-handed practice until succession by the author on 1 July 1977. No distinction was made between prescriptions issued at consultations and those issued without seeing the patient.

The following information from each prescription was coded and stored on computer file:

1. Identity, age and sex of patient.
2. Drugs prescribed (group and individual coding by the Department of Health and Social Security coding).
3. Daily dose of drug.
4. Days' supply prescribed.
5. Indication for each drug prescribed (coded using the *International Classification of Health Problems of Primary Care*, WONCA, 1976).

The coded information was then returned to the author as an age/sex register of patients who had had prescriptions written during the six-month period with the information noted above. The register was then compared with the age/sex register of all patients in the practice at 31 December 1977, the practice population having been divided into the following cohorts: 0-14 years, 15-24 years, 25-34 years, 35-44 years, 45-54 years, 55-64 years, 65-74 years and 75 years and above.

From this information two analyses were made:

1. By patient

a) Analysis of patients receiving any prescription;

b) Analysis of patients receiving any item for 90 days or

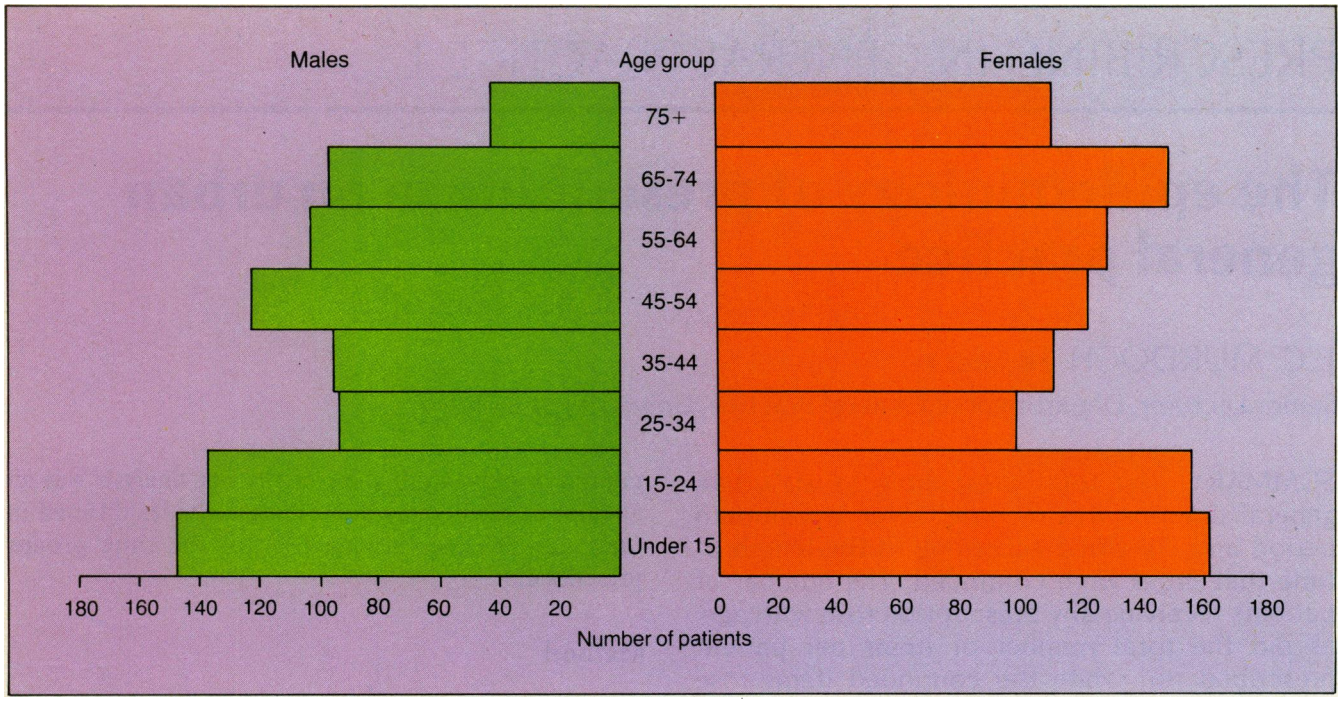

Figure 1. *Age and sex distribution of patients receiving prescriptions as at 31 December 1977.*

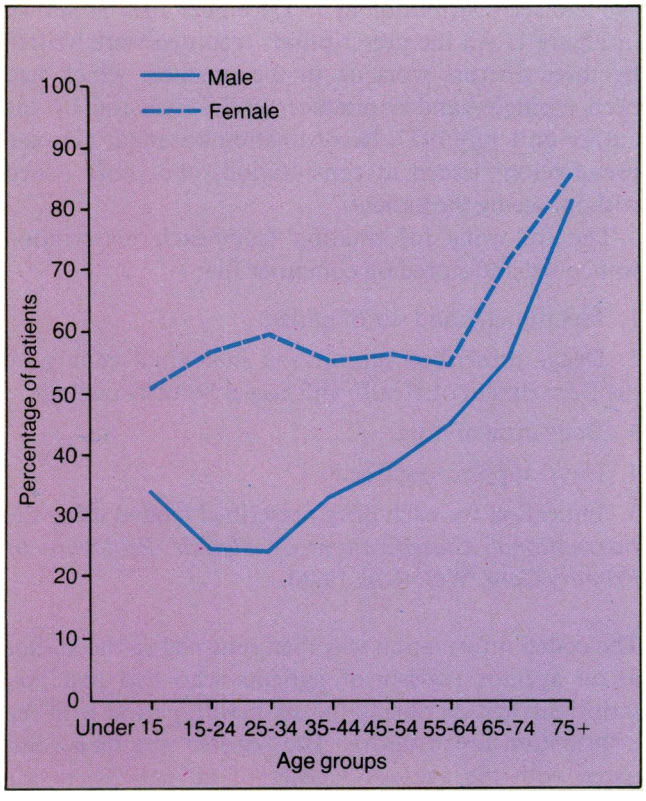

Figure 2. *Percentage of patients receiving prescriptions over a six-month period, by age and sex.*

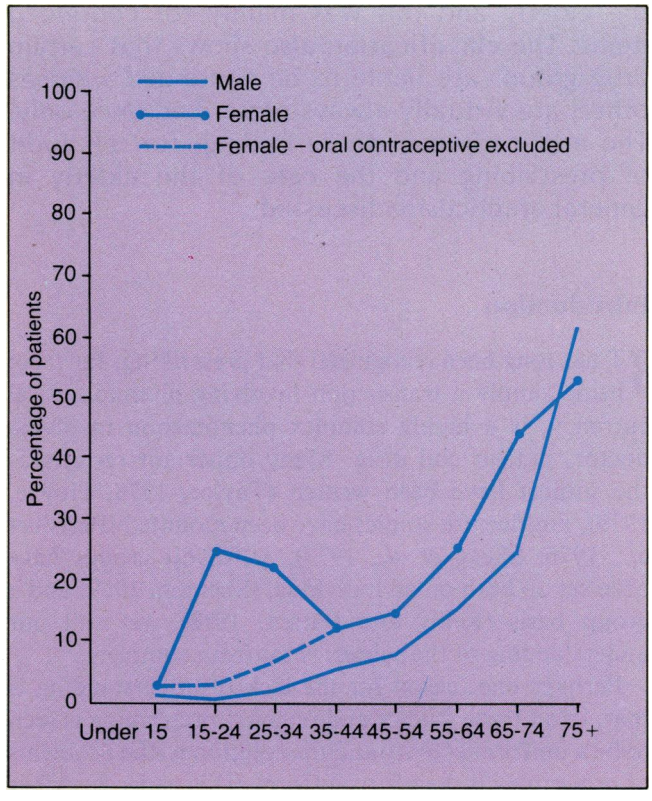

Figure 3. *Percentage of patients prescribed any item for 90 days or more, by age and sex.*

more during the study period.

2. By items

Items were classified into three groups:

a) Items given once and not repeated in the course of the six-month period ('one-off' items);

b) Items repeated but given for less than 90 days in all ('short-term repeats');

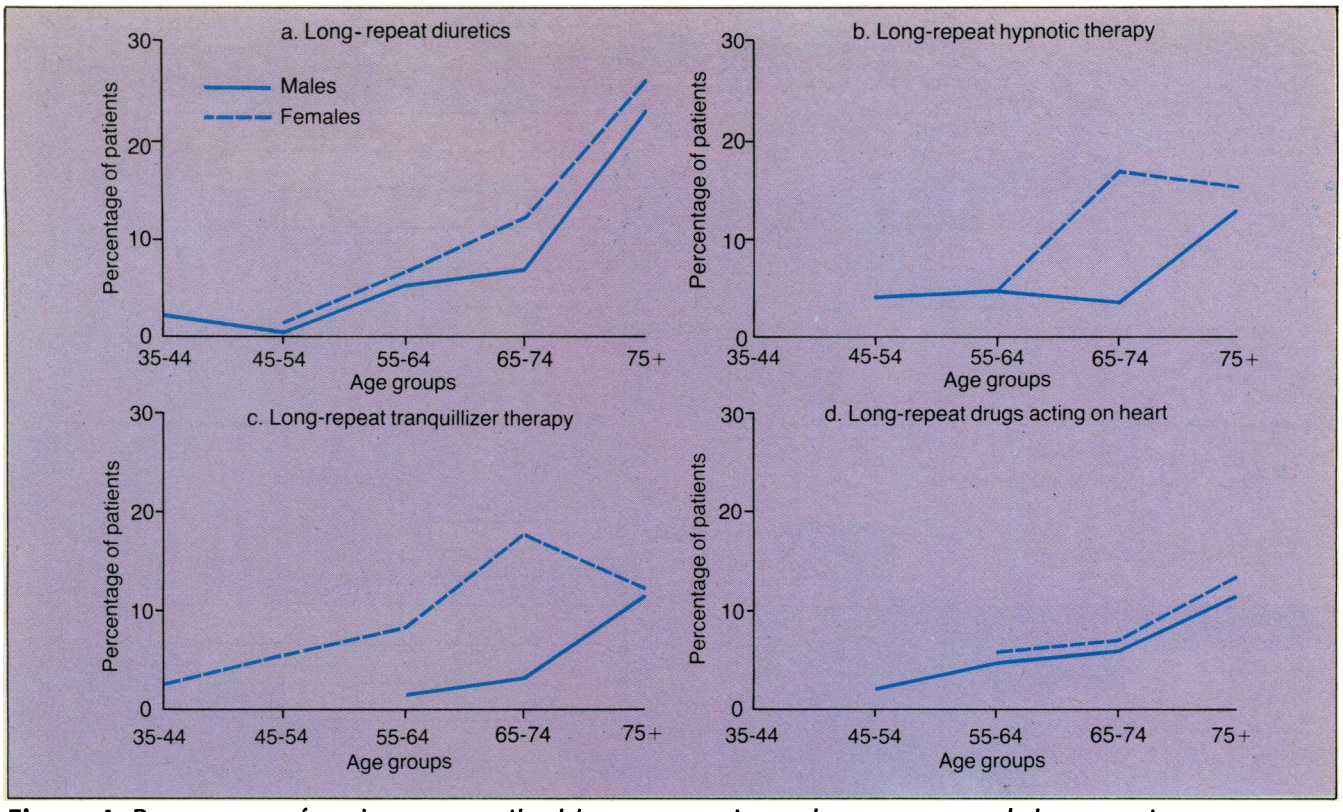

Figure 4. *Percentage of patients prescribed long-repeat items by age, sex and therapeutic group.*

c) Items repeated for 90 days or more ('long-term repeats').

Statistical comparisons were done using a chi square test.

Results

1a) Patients receiving any prescription in the study period

It is seen from Figure 2 that the percentage of female patients receiving any prescription is higher than that in male patients in all age groups. This difference is highly significant ($p<0{\cdot}005$) for all age groups up to 55 to 64 years. It is significant in the 65 to 74 year age group ($p<0{\cdot}027$) but not significant above 75 years.

Within each grouping by sex, the percentage of patients prescribed for in each age grouping was compared with that for each other age group. In men, the percentage of patients prescribed for in the 75 years and over age group was far more highly significant than in all other age groups ($p<0{\cdot}01$), while in women this significantly greater percentage applied also to the 65 to 74 age group. There were no significant differences otherwise.

1b) Patients receiving an item or items continued for 90 days or more

Figure 3 shows that the percentage rises steadily with age for those patients receiving an item or items continued for 90 days or more.

Under the age of 55 there was a total of 94 females and 22 males receiving such items; however, 65 of these females were receiving oral contraceptive therapy. Over the age of 55 the number involved rises steeply. A total of 333 patients were on 603 continued items. One hundred and eighty-two patients were on one item, 81 on two, 41 on three, 20 on four, six on five, two on six, and two patients were on seven such items.

The most common drug groups prescribed for these patients were diuretics, hypnotics, tranquillizers, drugs acting on the heart, and oral contraceptives. The percentages of age and sex groups prescribed the first four of these items are seen in Figure 4, a to d, and it can be seen that such patients are largely confined to the later age groups. These five therapeutic groups accounted for 339 of the 603 continued items.

2. Analysis of items prescribed

A total of 5,391 items was prescribed in the practice during the six-month period, or 5·7 items per patient prescribed for. However, it will be seen from Figure 5 that this total varies widely and rises steadily with age. Indeed the items prescribed to the patients aged 65 and older (2,725) account for over 50 per cent of the total.

When the items are classified into the three groups described above, it is seen that 'one-off' items per patient do not rise with age, while both 'short-term' and 'long-term repeat' items show a very highly significant rise with age (Figure 5a, b and c) ($p<0{\cdot}001$); thus, the increase in the number of items with age seems not to apply to one-off prescribing.

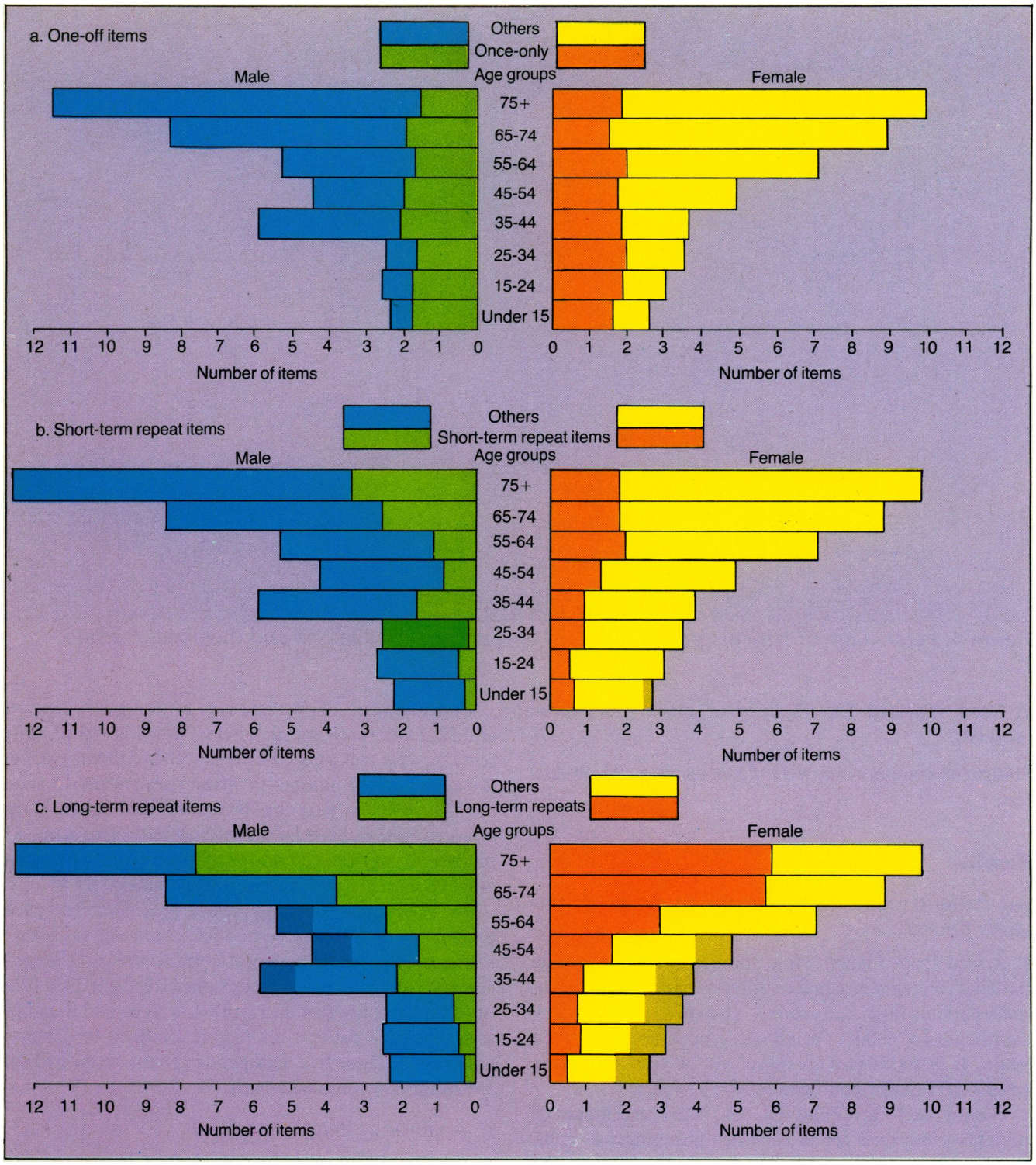

Figure 5. *One-off, short- and long-term items as a proportion of total items prescribed per patient, by sex and age.*

If the total prescribing in the various age groups is presented schematically as in Figure 6, it is seen that there is a marked shift in the type of prescribing carried out in the elderly—nearly 60 per cent of all items being the long-term repeats. Indeed, approximately 30 per cent of the total items prescribed in the practice were long-term repeats prescribed to those over 65 years. In the patients aged 54 years or younger the bulk of prescribed items are of the one-off category, with only 26·8 per cent being long-term repeats.

When the various types of prescribing are looked at in terms of the prescribing of a particular group of drugs, differences are also seen. The drug groups for whom most items were prescribed are seen in Table 1. Together these account for 56·6 per cent of the total number of items, 58 per cent of the one-off items, 53·3 per cent of the short-term repeats and 47·8 per cent of the long-term repeats. It can be seen that diuretics, sedatives, hypnotics, and heart preparations are mainly prescribed as long-term repeats, while antibiotics, topical prep-

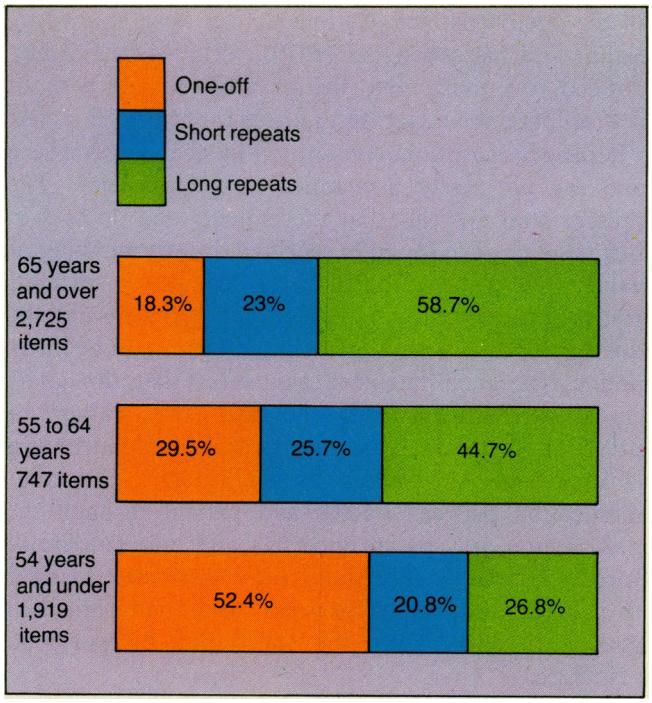

Figure 6. *Percentage of items prescribed by age and type of prescription.*

Table 1. Percentage of prescriptions for the eight most commonly prescribed drug groups by type of prescription.

Drug group	One-off items	Short-term repeats	Long-term repeats
Diuretics	*12.3*	*24.3*	*63.4*
Sedatives	*15.2*	*24.1*	*60.7*
Hypnotics	*5.8*	*15.5*	*78.7*
Antibiotics	*78.7*	*21.3*	—
Topical preparations	*65.6*	*34.4*	—
Heart preparations	*6.1*	*24.1*	*69.8*
Expectorants	*65.6*	*34.4*	—
Minor analgesics	*45.3*	*41.8*	*12.9*

arations and expectorants do not figure as long-term repeats. Minor analgesics occupy a midway position, with one-off and short-term repeat items present in roughly equal proportions.

Discussion

This study confirms earlier findings by Skegg and colleagues (1977) that females are more likely to receive prescriptions than males within a given period. Similar sex differences were also reported by Dunnell and Cartwright (1972), apart from their findings in the 14 years and under age group that males were more often prescribed for than females. The study does show, however, that after the age of 65 in females and 75 in males there is a significant increase in the percentage of the population prescribed for, in the percentage receiving a long continued drug, and in the number of short- and long-term repeat items prescribed per patient.

The main purpose of the study was to attempt to subdivide prescribing according to the arbitrary criteria used in one-off, short-term repeat and long-term repeat items. The differentiation appears valid in that these activities vary in their age distribution and in the drug groups prescribed.

The one-off prescription can be interpreted as a therapeutic response to a patient's presented problem, although in a few cases the prescription may have been the last one issued to the patient. The problems resulting in such prescriptions have an acute onset and a resolution which may be at least partly due to the effect of the drug. It is interesting that the items per patient prescribed in this way do not vary with age. The drugs most commonly prescribed are the antibiotics and the cough suppressants and expectorants. It is in this type of prescribing that studies of self-audit are particularly important and several such studies have revealed doubts as to the efficacy of drugs so prescribed, for instance, antibiotics in respiratory illness (Howie, 1975; Stott and West, 1976). It is also in this type of prescribing that advice given "towards better prescribing" (Taylor, 1978) will bear fruit, for the decision to prescribe and choice of item is in the doctor's hands. Yet one-off prescribing accounts for a small part of the total task in this practice, 31·5 per cent of all items.

The bulk of the prescriptions are short- and long-term repeat items, the latter particularly representing an important area of study for general practitioners. It should be noted that no attempt has been made here to differentiate those prescriptions which have been written without contact with the patient—the classical repeat prescriptions described in the studies of Balint and his colleagues (1970) and Manasse (1974). The tendency to continue drug therapy occurs whether or not the doctor sees the patient and the repeat prescription without contact is merely another aspect of that tendency.

The epidemiology of long-term repeat prescribing is seen in Figure 3, where an exponential rise in the percentages involved is seen in both sexes. The number of such items rises steadily with age, as can be seen in Figure 5, and it will be noted that these items account for 58·7 per cent of all prescribing in the 65 years and over age group and for just under 50 per cent of all prescribing. The drug groups commonly prescribed in this way are diuretics, the hypnotics, the tranquillizers and heart preparations, and the percentages of each age and sex group on long-term repeats of these drug groups become considerable after the age of 65 years.

Having established that the phenomenon of long-term repeat prescribing constitutes a considerable part of the overall task of prescribing in this practice, it is necessary to give possible explanations for its occurrence.

First, the drugs prescribed are effective. It seems

self-evident to state that diuretics are effective in the treatment of congestive cardiac failure and hypertension, that tranquillizers sedate, that hypnotics give sleep, and that heart preparations such as digoxin and beta-blockers have an important role in the management of chronic ischaemic heart disease. These are, however, very important reasons for why such long-term repeat prescribing takes place.

Secondly, the drugs have been prescribed since previous significant illnesses. This applies particularly to the diuretics and heart preparations. Many hypertensives have been prescribed thiazide diuretics and, after a myocardial infarction, patients have been prescribed diuretics for cardiac failure or digoxin for cardiac arrhythmia. The latter therapy can be stopped without any harm to the patient (Hull and McIntosh, 1977) and the same might be said for diuretics, considered innocuous by many general practitioners, but still the most common cause of drug reactions in the elderly (Williamson, 1978). In many such cases patients have been warned "never to be without tablets" and not surprisingly are reluctant to be without them. As part of the *caritas* of general practice, it should be remembered that around us at each consultation with the elderly sit the ghosts of doctors past, much more revered than we, and their advice will often be taken in preference to our own.

Thirdly, it has rightly been stated that drug compliance is poor in the elderly (Parkin *et al.*, 1976) but perhaps this applies only to the one-off items given on hospital discharge. Different results have been described by Drury and colleagues (1976) where patients are seen entirely in general practice and, indeed, they found that first prescriptions were less likely to be followed than repeat ones. The effect of the technique of monthly reinforcement in aiding compliance in the elderly is well seen in this study. It is interesting that the drug groups which tend to become long-term repeats are diuretics, hypnotics and digitalis, all of which have a once daily dosage.

Fourthly, workload considerations also influence the tendency to long-term repeat prescribing in the elderly. Frequent review and adjustment of therapy is a time-consuming activity, particularly where elderly patients are concerned. If all the drugs prescribed were given monthly in consultation with the patient, this alone would increase the workload by 4,000 consultations per year in a practice which, in the same period, had a total of 7,841 consultations. While it may be argued that to stop giving prescriptions without seeing the patient as suggested by Williamson (1978) might wonderfully benefit the patient, the short-term implications of this suggestion for the workload of the general practitioner tend to perpetuate this activity. Much the same could be said for the proposals that drug instructions should be carefully explained or written for the elderly (Lewis, 1980).

Lastly, the place of the long-term repeat prescription in the doctor/patient relationship has been studied by Balint and his colleagues (1970), although that study applied to prescriptions written and received without doctor/patient contact. In this account Marinker states: "Repeat prescriptions are written in steel and concrete and are not easily dismantled or remodelled." The present study reveals that the patients and doctors in this practice have found in repeated drugs something of value. The patient, particularly the elderly patient, comes to the doctor with his incurable problems and the doctor responds with a prescription which can be interpreted as a signed statement to the effect that, though he cannot cure the problem, he does care. Failure to prescribe can therefore be interpreted by the patient as a lack of care or concern by the doctor. The communication between doctor and patient through the prescription may be an imperfect and indeed harmful form of communication, but it may be the price we have to pay for the contact between doctor and patient in general practice, given the constraints of workload resources.

However valid these explanations may be, the fact remains that a significant proportion of the elderly in this practice are taking certain drugs on a long-term basis. The challenge for the general practitioner is to try to reduce the incidence of the phenomenon without harm to the patient or to the relationship between them. How then can this be achieved?

The first approach concerns self-audit as has been described by Taylor (1978), particularly in the management of hypertension, congestive cardiac failure, myocardial ischaemia, insomnia and anxiety in the older patient. However, it must be remembered that the decision to be influenced is when or what *not* to prescribe: "Is this drug still necessary?"; "Does this drug still work?". In practice this decision is much more difficult than that associated with the new prescribing act. An important first step in this audit is to identify which patients are having long-term repeat prescriptions by using methods of recording repeat prescriptions as have been described by Manasse (1974) and Drury (1973).

The second approach is to raise the issue of the appropriateness of our present methods of caring for the elderly in general practice. The evidence here is that general practitioners respond to the problems of ageing by the repeated prescribing of drugs. This is not surprising, given the fact that the main strategy employed is the consultation either requested or arranged. We must evaluate other strategies which may be more appropriate. These might include comprehensive geriatric screening involving the health visitor, the provision of physiotherapy services and the involvement of voluntary agencies to alleviate the social isolation which so often leads to a visit to the doctor and a prescription for hypnotics or tranquillizers. Another possibility is the setting up of discussion groups for the elderly where patients could learn together about the problems of

ageing and their drug therapy using topics suggested by Hermann and colleagues (1978). These groups might also afford exciting possibilities for undergraduate education in that students could both teach and learn the principles and practice of therapeutics.

Finally, there are implications for health education in the practice. The study reveals that long-term prescribing is virtually non-existent before the age of 55 years in women and 65 years in men. Might health and drug education of groups of younger patients in the practice prevent the exponential increase seen in Figure 5c? Might the provision of health education advice on problems such as sleep and anxiety given to the individual patient and signed by the doctor be more effective in the long term in cost to society and benefit to the patient?

In an editorial on prescribing in general practice (*Journal of the Royal College of General Practitioners,* 1978) we are reminded of the intertwining of *scientia* and *caritas* in this activity. Howie (1979) makes the same point when he states: "Assessment of the relevance of drugs prescribed for physical illness is complicated by the unique relationships between doctor, patient and illness which are so important a part of general practice." The desired outcome of audit of our prescribing should be increased quality of care for the individual patient, not primarily therapeutic purity or saving of resources. It therefore follows that it is the general practitioner alone who can apply the best standards of therapeutic care given his knowledge of the patient for whom he prescribes and the relationship which they share. That he needs expert advice is self-evident but first he must describe his prescribing so that relevant dialogue might replace useless dogma. It is intended that the classification of prescribing used in this study might be a means to this end.

"To write prescriptions is easy, but to come to an understanding with people is hard"
(Franz Kafka, *A Country Doctor*).

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Acknowledgements

The work of the practice was carried out with my colleagues Professor J. D. E. Knox and Dr R. G. Cairncross. Professor J. Crooks and the staff of the Medicines Evaluation and Monitoring Organization were responsible for the coding of drugs and problems. Mr Alex Patterson of the Department of Pharmacy, Heriot Watt University, and his staff provided the data processing and computer programming. Mr Roy Anderson, Statistical Assistant, Scottish General Practitioner Research Support Unit, provided statistical advice.

Paediatric health screening

Paediatric health screening comprises a significant component of a family physician's practice. A variety of protocols exist for paediatric screening yet many of the diseases included in such screening have marginal supportive evidence in the literature.

This article examines 14 areas commonly included in paediatric health screening. Each is evaluated based on a thorough literature review, according to basic criteria necessary to justify periodic screening. Specific recommendations are made which are considered to be practical and appropriate in practice. These have been incorporated into the protocols currently used at the University of Washington Family Medical Center.

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