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Towards better prescribing

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Introduction

IN the inexact science of clinical practice, selection of the best course is usually a matter of finely balanced judgement. Prescribing is in this respect no different from other clinical activities. I therefore intend to take as my starting point a definition of 'rational' prescribing based on that of the US Task Force on Prescription Drugs *(New England Journal of Medicine,* 1969). This definition takes account of the following elements:

Is the drug to be prescribed:

1. Necessary—is it likely that the patient's problem(s) will be best solved by a medicine?
2. Effective—does the drug really work?
3. Safe—will the drug do more good than harm?
4. Economic—is there a cheaper way of solving the patient's problem(s) as effectively?

These questions might profitably be applied to individual prescribing decisions, but they may also be applied to general-practitioner prescribing in a wider context. Are the drugs which we prescribe generally necessary, effective, safe and economic, or is there room for improvement? I will describe a view of the present state of prescribing by general practitioners in the UK. I will then go on to examine existing and possible future means of inducing improvement.

The present state of prescribing

Necessary?

During 1975, on average six prescriptions were issued per person on NHS lists (DHSS, 1975). Dunnell and Cartwright (1972) found that two fifths of adults had taken prescribed or non-prescribed medicines daily in the two weeks preceding interview. Nearly three quarters of prescribed medicines were repeat prescriptions and 25 per cent of adults had taken a medicine first prescribed over a year before. They concluded that ". . . for a sizeable proportion of people, medicine taking has become a habit often encouraged, or at least supported by their doctors". Recently Skegg and his co-workers (1977) found that, in a population of 40,000, one third of women aged 45 to 49 years had received a psychotropic drug and one tenth had had an anti-depressant, during one year. Dunlop (1970) estimated that in the UK, one night's sleep in every ten was hypnotic-induced. On average every child receives one course of antibiotic annually during the first six years of life *(British Medical Journal,* 1974).

This widespread medicine-taking is not a new phenomenon. In relation to population, the number of prescriptions issued has increased by about one third since 1949, the year following the inception of the NHS (DHSS, 1975). Considering the extent of therapeutic innovation in the intervening period, this increase is, if anything, less than might be expected. There has, however, been a major alteration in the nature of prescriptions issued, particularly in terms of potency and expense; the purgatives, tonics, and elegant but ineffectual unguenta of yesteryear have been replaced by the antibiotics, psychotropics, and topical steroids of today. The availability of such potent remedies has, rightly, given rise to increasing awareness of the need for greater rationalization of prescribing.

It is commonly claimed that patient demand is largely responsible for over-frequent prescribing. However as Stimson (1976) states, various studies have found that whereas doctors anticipated patients to expect a prescription in 80 to 90 per cent of consultations, the actual expectation of patients for a prescription was much lower (30 to 50 per cent of consultations).

Some prescribed drugs are never dispensed (Waters *et al.,* 1976); more are hoarded, unused (Nicholson, 1967; Dunnell and Cartwright, 1972), and as many as two thirds of patients may fail to take their drugs as advised (Lloyd, 1976). As Richard Asher (1972) said:

> "If you give a man a pill there are only two things he can do with it: he can swallow it or he can throw it away."

Perhaps then, Stimson (1976) is correct in suggesting that non-compliance represents a statement of opinion regarding the value of the medication prescribed.

Although other explanations are possible, over-frequent prescribing by many doctors must be regarded

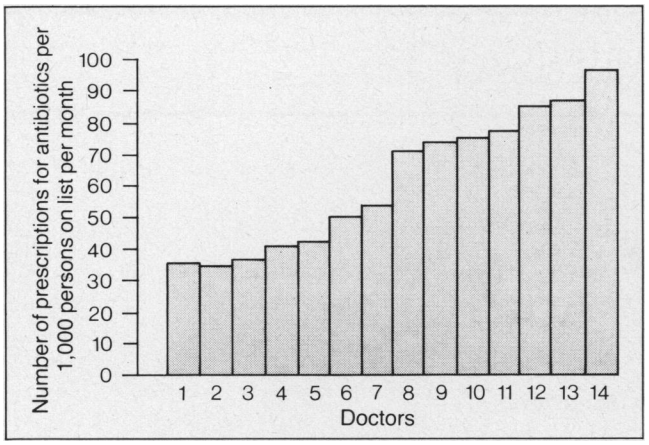

Figure 1. *Prescriptions for antibiotics issued by 14 urban doctors during December 1974.*

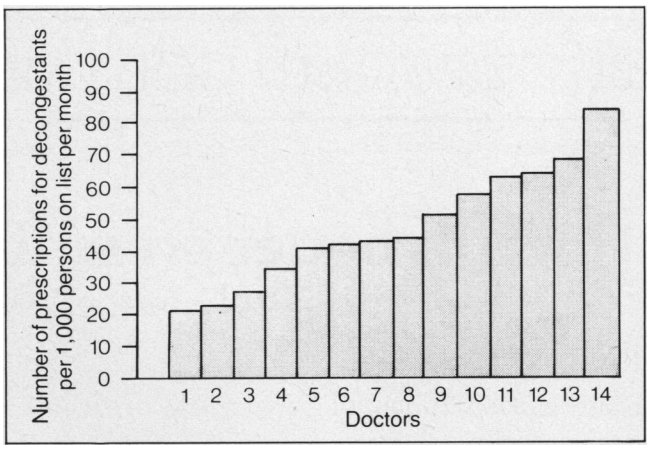

Figure 2. *Prescriptions for decongestants issued by 14 urban doctors during December 1974.*

as a highly probable reason for the substantial variations in prescribing frequency found in many studies (Benjamin and Ashe, 1964; Lee *et al.*, 1964). Figure 1 shows, for example, the degree of variation in frequency of prescriptions issued for antibiotics, taken from a study of 14 urban doctors during December 1974 (Taylor, 1978b); such large differences are unlikely to be entirely due to variations in morbidity. Two principal explanations are possible (although a combination of both factors may be responsible): the doctors prescribing at low rates are not prescribing drugs for conditions that warrant drug treatment; or, the doctors prescribing at high rates are prescribing for conditions that do not warrant drug treatment.

Howie and his co-workers (1971) demonstrated that, in first consultations for new respiratory illness the rate of prescription of antibiotics by 141 doctors varied from 25 per cent to 100 per cent of consultations. Studies of the differences in outcome resulting from such widely different prescribing policies are urgently necessary to help resolve and rationalize these anomalies. Some such studies might show, as did Stott and West's (1976) double-blind trial of doxycycline in the treatment of purulent sputum without chest signs, that an accepted treatment is no more effective than placebo.

Effective?

There are at least two aspects of effectiveness: first, a drug might be ineffective through being pharmacologically inert; secondly, a pharmacologically active drug, such as penicillin, might be ineffective through being administered in inappropriate circumstances, for example, for a viral infection. In both instances a placebo therapeutic effect might nevertheless be obtained, so that two associated variants of placebo prescribing also exist.

Preparations possessing, at best, dubious pharmacological activity are still widely available. The 'tonic' is a commonly quoted example which at least usually has the merit of being inexpensive. Although tonics appear to be less popular, having been replaced by more sophisticated (and more expensive) placebos, the current edition of *MIMS* still carries a special section on them. Many older and well established drugs were introduced at a time when standards of acceptable scientific verification of effectiveness were lower than at present. The effort and expense required to mount double-blind trials of the 70 or so separate preparations for cough and cold relief listed in a current edition of *MIMS* would now be unrewarding, yet the evidence supporting the effectiveness of cough suppressants and expectorants is minimal; leaving aside the question of whether such effects are in the first place desirable, should they occur. Over 17 million prescriptions for cough mixtures were issued in England in 1974 (DHSS, 1975). Figure 2 shows that there was a four-fold variation in the range of prescription of these preparations by 14 urban doctors (Taylor, 1978b). This is again likely to be due to factors additional to differences in patient morbidity.

Using a pharmacologically inactive preparation as a placebo is one thing: using a pharmacologically active preparation for this purpose is quite another. Most active preparations are capable of causing death, however rarely, and the risks of therapy have to be balanced against the likely advantages. The prescription of a substance carrying any degree of risk in circumstances where no appreciable therapeutic benefit can logically be expected must be regarded as unsatisfactory, however understandable, yet most if not all of us must admit to such prescribing. Apart from the pharmacological risks, the prescription of, say, an antibiotic for a cold may mislead the patient into believing that this is the correct and necessary treatment for similar future illness.

Lastly there is the question of comparative effectiveness of similar drugs. Certain preparations, such as digitalis leaf, thyroid extract, and liver extract can be clearly regarded as obsolete; their reliability of effect is considerably inferior to modern equivalents. However, the comparative effectiveness of many modern drugs

(for example non-steroid anti-inflammatory drugs, and antibiotics of similar type such as ampicillin, amoxycillin, and talampicillin) is much less clear cut and it is here that the potential for commercial promotional activity is greatest. The individual general practitioner cannot assess reliably such relatively minor differences in effect on the basis of his own prescribing; although this is perhaps implied by pharmaceutical companies in the distribution of trial 'samples'. The general practitioner's resultant dependence upon various commercial and non-commercial sources for such information is discussed later.

Safe?

> *"There are no really 'safe' biologically active drugs. There are only 'safe' physicians."*
>
> H. A. Kaminetzky (1963)

Adverse drug effects have to be balanced against possible therapeutic advantages. A drug having a 50 per cent incidence of fatal agranulocytosis might be acceptable for the treatment of life-threatening cancer, but a drug with a 0·05 per cent incidence of fatality would be unacceptable for treatment of the common cold. The general practitioner deals mostly with patients suffering from non life-threatening conditions. He must therefore largely employ drugs which have an insignificant risk of serious adverse effects.

Certain drugs such as amphetamines, systemic chloramphenicol, and methaqualone have such potential for undesired consequences as to limit effectively their therapeutic use to a small number of strictly defined conditions. Wade and Hood (1972a and b) found that these drugs were prescribed mainly by a small (but important) minority of general practitioners. Other drugs such as phenylbutazone (which may cause death from drug-induced aplastic anaemia), chlorpromazine (which may cause death from drug-induced jaundice), phenacetin (implicated in the causation of renal papillary necrosis), and the estolate of erythromycin (which may induce jaundice more readily than other forms of erythromycin), although avoided by many doctors, have not yet reached the stage of widespread voluntary limitation by consensus. Yet others, such as barbiturates, although considered by many doctors to have been superseded by safer alternatives, continue to be prescribed in quantity.

One final aspect of drug safety is the lack of emphasis given to it in promotional literature. In an analysis of 591 drug advertisements, Stimson (1975) found that information about contraindications was given in only 4·2 per cent of advertisements, about side effects in only 3·9 per cent and about special precautions in only three per cent. Thus a doctor who relied heavily on promotional literature for his information on drugs might be expected to underestimate the importance of adverse effects.

Economic?

Economy must be related to effectiveness. As Robertson and her co-workers (1975) point out, "cost becomes less important when a drug used for a serious disease is unique, or if it is much more effective or much less toxic than the alternatives; if it offers compensatory economies and even perhaps if it is much more likely that the patient will comply with the doctor's instructions." Thus a highly expensive drug could be economic if it prevented the need for, say, an even more expensive surgical operation, or if it enabled the patient to get back to work earlier than he would have done on any other therapy.

Many studies have demonstrated substantial differences between doctors in their levels of average prescribing costs (Benjamin and Ashe, 1964). In a study of the prescribing costs of 14 urban doctors, I have shown elsewhere (Taylor, 1978a) that although these cost differences arose principally from differences in prescribing frequency, for certain therapeutic categories only (particularly sedatives) doctors with high total costs were more likely to prescribe more expensive preparations. Nevertheless, the possible saving which might result from prescribing cheaper preparations is much less than might be thought, and the greatest savings would probably result from reductions in prescribing frequency (Huskisson, 1973).

Solutions — present and possible

Having thus delineated and detailed the problem, it is now feasible to examine possible solutions and methods and comment on their respective practicality and desirability. What is being advocated is a change in acquired prescribing behaviour. Individuals may be influenced to alter behaviour by techniques which range from the purely coercive to the purely persuasive, and various conceivable methods of solution will be considered under these headings.

Coercive methods

Effectively, these are controls applied on manufacturers, prescribers, and patients by external agencies. The State is the prime agency in this respect, and past and present governments have already instituted various forms of external control. In examining the possibilities presented by coercive methods, I will refer to some of the present state controls and outline theoretical developments and alternatives.

Controls on pharmaceutical manufacturers. A highly effective way of controlling the prescription of an undesirable drug is to restrict its availability. In the UK the general practitioner has complete clinical freedom to prescribe any drug he considers necessary with the sole exception of certain appliances and specified substances which are not considered to be drugs. However, the UK Government can effectively limit the prescription of a drug which its advisers (the Committee on Safety of Medicines) consider undesirable, by refusing to issue the product licence necessary

for its production and marketing. Although it is still theoretically possible for a doctor to prescribe an unlicensed drug for an individual patient, the ban on production and marketing effectively prevents this. In the USA, the control on production and marketing of new drugs exerted by the Federal Drug Agency (FDA) is, if anything, stricter and perhaps more capricious than in this country. As a result of the FDA's restrictions, the introduction of many important therapeutic advances, such as beta blockers, into the USA may have been unnecessarily delayed.

Other state activities in the control of the pharmaceutical industry include the control of profit levels under the voluntary price regulation scheme (which regulates the total profits made from NHS sales); the Medicines (Data Sheet) Regulations (1972); and recent negotiations intended to restrict promotional expenditure. These measures (in particular the last two) are obviously designed to affect the prescribing behaviour of general practitioners by improving and standardizing the quality of commercial drug information and by indirectly reducing the effect of drug advertising.

At present drug safety is the major element in the selection of drugs for product licences; however, in a more totalitarian system approved levels of efficacy and cost might also be regarded as important. One ultimate extension of this form of control would, of course, be a monopolist state-owned pharmaceutical industry such as already exists in certain socialist republics, such as the USSR and China. Although opinion on the desirability of such a development is determined largely by political persuasion, and further discussion is inappropriate in the present context, it is difficult to refute the claims of independent pharmaceutical manufacturers regarding the negligible research output of these existing state concerns.

Nevertheless, the thalidomide disaster heightened awareness of the need to ensure safety of medicines within reasonably practicable limits. Two less well known examples of another danger, resulting from the unrestricted production of drugs by small manufacturers, are quoted by Wade (1970). As a result of the inclusion of known lethal substances in patent medicines, 93 people died in the USA in 1938, and 100 people died in France in 1954. The individual prescriber cannot be expected to take responsibility for ensuring the safe production of the medicines which he prescribes.

It is logical that a state-sponsored body should undertake this and few would take exception to the work of the Committee on Safety of Medicines. It can be strongly argued that a Government sponsored body is also much better able to assess the efficacy and relative cost of individual medicines, although rather more individual prescribers might disagree with this. The new Committee for Review of Medicines will be working partly in this field. The greater division of opinion concerns whether or not the recommendations of such a body could or should be enforced. Examples of controls of this nature will now be examined.

Control of prescribing doctors. Direct external control of general-practitioner prescribing is presently limited in the NHS to audit of prescribing costs. The anomalous situation whereby the prescribing costs of hospital practitioners are free from such control may have arisen from the ease with which the prescribing costs of individual general practitioners can be identified through the machinery of the Prescription Pricing Authority (PPA). The PPA exists primarily for the purpose of pricing the prescriptions dispensed by the independent dispensing chemists who contract their services to the NHS. No such pricing system is required in hospitals, where the hospital pharmacy is an integral part of the service; as a result, information on the prescribing costs of individual hospital doctors is difficult to obtain. Nevertheless, if cost control of general-practitioner prescribing is considered necessary, the excuse of inconvenience is a poor justification for the exclusion of an equally important group of prescribers (i.e. hospital doctors) from the same control.

The system operates by identifying individual practitioners whose prescribing costs are unacceptably higher than average. A formal procedure exists for the recovery of excess costs from the doctor concerned (Hutchinson, 1955) but is now very rarely activated. In 1974 the number of cases in which excess costs were recovered from remuneration was five, representing about 0·025 per cent of practitioners in England (DHSS, 1975).

However, the level of activity of the PPA and DHSS in processing prescribing data in relation both to general prescribing trends and individual prescribers is probably underestimated by most doctors (Tricker, 1977). In 1973 almost 3,000 practitioners (about 15 per cent) in England were contacted about the pattern and cost of their prescribing by the Regional Medical Service, acting at the instigation of the DHSS (Parish, 1976). Most of these visits were informal and thus technically 'persuasive' rather than 'coercive'; however, the ultimate sanction of formal proceedings must have some deterrent effect. It is noteworthy that although most of the doctors to be visited are identified on the basis of prescribing costs, some are identified by their having issued prescriptions considered by the PPA to be unusual or apparently wasteful. Also once a doctor has been identified as a high-cost prescriber the regional medical officer's visit is not confined to discussion of costs but includes a detailed analysis of drugs prescribed (Tricker, 1977). As Eaton and Parish (1976a) point out, the investigated prescriber may well feel that the DHSS views high-cost prescribing as bad, without knowing whether similar qualitative findings might occur among lower cost prescribers.

In the study of 14 urban doctors (Taylor, 1978a) a crude qualitative score was calculated for each doctor based on numbers of prescriptions issued for drugs, such as amphetamines, methaqualone, and barbiturates, whose widespread use could be strongly chal-

lenged. A weighting was applied to each drug according to its estimated undesirability. Poor qualitative scores were not associated with either high or low cost levels, supporting the contention that high levels of prescribing cost cannot necessarily be assumed to predict low levels of prescribing quality, except perhaps in very extreme cases. Although further confirmatory work is required, cost control cannot therefore be regarded as a cheap and convenient method of controlling quality of prescribing.

It is in relation to qualitative rather than economic control that conflict between the profession and the state may conceivably arise. Tricker (1977) indicated two possible further measures of control of prescribing: drug expenditure budgets and the limitation of the range of drugs prescribable under the NHS.

Drug expenditure budgets would operate by confining drug expenditure within predetermined cash limits allocated to family practitioner committees, area health authorities, or even individual prescribing doctors. Apart from considerations of practicality and desirability, this would still be a form of purely economic control. On the other hand, limitation of the range of drugs prescribable under a health scheme allows the operator of the scheme to select drugs on the basis of safety and efficacy as well as economy. A system of this type operates in New Zealand (Wardell, 1974); it was also suggested as a basis for the American 'Medicare' scheme *(Nature,* 1969). The policy of the DHSS has, however, been based more and more on educational rather than coercive methods (Martin, 1957; Parish, 1971) and the adoption of such a system would represent a major change in attitude. It would also be unacceptable to the majority of UK general practitioners at present because the important principle of complete clinical freedom within the NHS would be compromised. However, an alternative view is that the operator of a health scheme such as the NHS has the right to determine the limits of the scheme and what will, and will not, be paid for. Excluded drugs could still be prescribed outwith the scheme; the New Zealand system provides for payment of such prescriptions through supplementary benefits, in cases of financial hardship.

Controls on patients. A further point at which control might be applied is on demand by the patient. In the UK, prescription charges might be regarded as such a form of control. These make a small but significant (about ten per cent) contribution to the national drug bill (DHSS, 1975), despite the fact that 55 to 60 per cent of prescriptions are exempted from charges. It is likely that prescription charges have some effect on reducing demand, although there is little information on this apart from Stout's (1968) small study, demonstrating a 50 per cent increase in prescribing costs in the month following the (temporary) abolition of charges in February 1965, and Dunlop's (1969) evidence that total prescriptions fell proportionately to the amount of direct charge applied over a period of several years. However, prescription charges have been applied since 1952 with only a short politically inspired break in 1965/6 so that it is likely that recent governments and their advisers consider them to have effects outweighing any associated political disadvantages. Further possible controls on patient demand might include restriction of availability of certain drugs under the NHS. Tricker (1977) describes aspirin as an example of a wide range of drugs available over the counter, which, if bought off prescription, could result in savings both to the NHS and to patients who are not exempt from prescription charges. These drugs could be made non-prescribable under the NHS or, alternatively, prescribable only for certain categories of patients (such as those already exempted from prescription charges). However, savings resulting from such a change would not be large and it is conceivable that other associated changes, for example, increased prescribing of more expensive equivalents, would outweigh any possible gains.

In fact, the emphasis of state involvement in general practitioner prescribing has increasingly tended towards persuasive rather than coercive methods and some examples of these will now be discussed.

Persuasive methods

The value of persuasive methods is fully recognized by the pharmaceutical industry, which was calculated by the Sainsbury Committee (Ministry of Health, 1967) to have spent an average of £550 per doctor on promotional activities during 1965. As Eaton and Parish (1976b) point out, the DHSS attempts to counterbalance this with sponsored publications such as the *British National Formulary* and *Prescribers' Journal.* However, commercial sources of information are preferred by many doctors (Ministry of Health, 1967; Dunnell and Cartwright, 1972; Eaton and Parish, 1976b).

In an attempt to stimulate critical self-assessment of prescribing, in a current DHSS experiment 1,500 general practitioners are each being supplied with details of the frequency and quantity of their prescribing of selected drugs. If the method proves successful it may be introduced generally.

In postgraduate education, Herxheimer and Twycross (1976) describe two methods of helping doctors to discuss their prescribing with each other: the first uses precirculated questions and the second partially completed decision flow-charts. Such methods might be more widely tested.

General practitioners working in partnership must influence each other for good or ill. There is a need for more information on the extent of this influence and the effect of set prescribing policies, for example, regarding antibiotic use, within practices. The prescribing of hospital doctors determines the nature of a proportion of prescriptions issued by general practitioners, often involving particularly expensive drugs. The cost, and perhaps quality, of general-practice prescribing might therefore be greatly affected by attending to deficiencies

in hospital prescribing, a point previously made in relation to the present cost control mechanism.

Lastly, greater attention might be focused on the influence of patients on prescribing. It is not uncommon for patients to present the doctor with the name of a new and highly expensive 'wonder drug' written on the back of an old envelope. This is the most obvious form of patient influence. Others may eventually obtain the particular drug, recommended by their friends or the media, by the simple expedient of 'not responding' to simpler and cheaper preparations. There are many other subtle ways of influencing doctors. It is often good practice to give a patient the drug he wants and has faith in; the disturbing aspect is that the drugs requested by patients are usually particularly novel and highly expensive. It is understandable that the media and the public accept uncritically a new 'breakthrough' but pharmaceutical manufacturers have an obligation (which most accept) not to capitalize on this credulity by 'leaking' information. The contribution of the general practitioner in counteracting such misinformation of patients is probably much under-estimated and greater support from the State health education units would assist him in this role.

Thus it appears that, although coercive measures of control of prescribing behaviour have a venerable record (stretching back to the 1925 'panel' system in the case of cost control), there is an increasing consensus that the future lies in persuasive education and audit, rather than external control.

Conclusion

I have tried to show how the present state of general-practitioner prescribing could be improved in relation to the ideal. The ideal, of course, is never attained, but this should not prevent us from striving towards it. Prescribing could be more related to actual needs of patients and be more effective, safer, and less expensive.

How is this to be achieved? The general practitioner is, essentially, a personal medical adviser. He accepts complete and comprehensive responsibility for the clinical care of a patient. In order to fulfil this exacting responsibility he must have unlimited freedom to advise the provision of whatever therapy he thinks fit. Equally, however, he cannot accept the same degree of responsibility when his advice is not followed. Thus, in a private system, a patient might refuse or be unable to meet the expense of the advised treatment. Similarly, the operator of a health care system—run by the State or independently operated—may choose to impose utilitarian limitations; clearly, he and not the doctor is then responsible for any consequent deficiencies in patient care. Sometimes, however, this risk is negligible. The control of dangerous substances where safer alternatives exist is one particularly good example; the issuing of product licences for new drugs in the UK can be seen in this light.

Related to professional responsibility is the control of variation in professional standards. By definition, not all doctors reach the average standard of prescribing. Some doctors must be better and some worse than average. The standard of a significant minority will be unacceptable. Who is to take responsibility for changing these doctors?

The integrity and autonomy of the profession can be preserved only by its acceptance of this responsibility. The consequent implications pervade the whole life-cycle of a doctor, from selection for medical school to age of retirement. It is unlikely that the unique individual relationships which we have with patients ever could, or should, be controlled with reference to a set of 'standards'. A more realistic approach is that of professional accountability. General practitioners in particular are in a position to remain accountable to no one for their actions, unlike their hospital colleagues who work in the more exposed system of ward rounds. What we must develop in general practice is an acceptable system of exposure of our clinical work—a system of peer accountability. Unlike 'peer audit', which implies the application of 'standards' to an individual doctor's actions, 'peer accountability' implies a different concept: satisfactory performance judged by the ability to justify actions to peers irrespective of pre-set conditions. This is a less restrictive concept and a more realistic one, allowing for the unique nature of each doctor-patient contact. It also has the virtue of being extant informally in many partnership practices. However, it must be expanded, particularly to include single-handed and other doctors who may have little opportunity to discuss their day-to-day work with colleagues. The creation of such a system as an integral part of day-to-day work presents a major challenge to the profession.

More detailed, comprehensive, and current information on individual prescribing is essential to the development of a system of self-regulation. As has previously been described, such a Prescribing Information Service is likely to result from the current DHSS experiment. In the study of 14 urban doctors in December 1974 (Taylor, 1978b), information on individual prescribing was fed back to doctors on request. A fictional example (Tables 1a, b and c) demonstrates how more detailed and useful feedback information can be provided. Overall prescribing statistics are given in relation to the group average (Table 1a). Table 1b gives information on cost, quantity, and unit cost for the 11 most commonly prescribed drug groups in the study (accounting for about two thirds of all prescriptions). Individual drug groups can be analysed in detail on a supplementary sheet, if this is indicated. Dr X has a much higher than average cost per 100 units of anti-rheumatic drug prescribed, and this can be identified as due to the prescription of 'Medol' (a fictional drug) at a cost of £7 per 100 tablets (Table 1c). The example also demonstrates how cost analysis can be used to provide information on prescribing patterns and thus, paradoxically, move away from the exclusive emphasis

Table 1a. Prescribing statistics (per 1,000 patients on list).

	Number of prescriptions	Cost (£)	Average cost per prescription (£)	Quantity (units)	Cost per 100 units (£)
Group average	418	329	0.79	23,911	1.38
Dr X	376	301	0.80	20,533	1.50

Only orally administered drugs, which constituted 80 per cent of all prescriptions, are included in the analysis. One unit of quantity equals one tablet/capsule or 5 ml liquid. All costs are net ingredient costs.

Table 1b. Cost, quantity, and unit cost of 11 most commonly prescribed drug groups in the study.

		Quantity issued per 1,000 patients (units)	Cost per 1,000 patients (£)	Average cost per 100 units of drugs prescribed
Analgesics	Dr X	2,132	15.99	0.74
	Study average	2,856	19.67	0.69
Sedatives	Dr X	1,874	8.06	0.43
	Study average	2,640	13.51	0.51
Cough remedies	Dr X	1,326	12.20	0.92
	Study average	2,640	19.20	0.73
Antibacterials	Dr X	2,261	64.00	2.83
	Study average	1,652	52.68	3.19
Alimentary	Dr X	1,803	16.98	0.94
	Study average	1,648	13.95	0.84
Hypnotics	Dr X	1,487	18.88	1.27
	Study average	1,277	14.57	1.14
Diuretics	Dr X	823	19.66	2.38
	Study average	1,256	20.86	1.66
Antihypertensives	Dr X	876	16.33	1.86
	Study average	1,113	20.72	1.86
Antianginal (incl. all beta blockers)	Dr X	285	5.24	1.84
	Study average	1,031	17.25	1.67
Antirheumatics	Dr X	234	9.46	4.04
	Study average	775	21.26	2.74
Antidepressants	Dr X	1,032	13.86	1.34
	Study average	722	9.92	1.38

Only orally administered drugs, which constituted 80 per cent of all prescriptions, are included in the analysis. One unit of quantity equals one tablet/capsule or 5 ml liquid. All costs are net ingredient costs.

Table 1c. Costs of antirheumatic drugs (excluding aspirin and steroids).

Name of drug	Number of prescriptions	Quantity issued (units)	Net cost (£)	Net cost per 100 units (£)
'Medol'*	2	160	11.20	7.00
Indomethacin	3	260	6.00	2.31
Quinine	1	24	0.78	3.25
Others	0	—	—	—

*'Medol' is a fictional drug.

Only orally administered drugs, which constituted 80 per cent of all prescriptions, are included in the analysis. One unit of quantity equals one tablet/capsule or 5 ml liquid. All costs are net ingredient costs.

placed on cost by the present periodic statistics.

Lastly, whilst it is of primary importance to be able to judge the quality of our present actions, it is equally important to keep abreast of current developments in therapeutics and, indeed, in medicine in general. It is unsatisfactory that most of our information indicates that pharmaceutical companies have a virtual monopoly in this field. General practitioners require practical and unbiased information on drug efficacy, safety, and economy. Because of their 'counter-acting' effect the various DHSS sponsored publications, although useful, do not always fulfil this role. *Proplist* was a well intentioned attempt to fill this gap. Its eventual failure may be at least partly attributed to an apparent lack of sympathy with the realities of daily practice. It is perhaps time to repeat the exercise, with greater understanding and sensitivity. A body composed largely of particularly well-informed general practitioners might be suited to this task.

The emphasis in continuing postgraduate education must similarly move away from its present dominance by subject specialists toward the theme of peer accountability; toward the definition of general practice as an independent discipline, aided by research conducted by general practitioners and their academic counterparts; and toward a mature contribution to medical knowledge and practice.

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Influenza A infections in young children

To assess the impact of an influenza A/Port Chalmers infection on normal young children, we monitored 147 children during an epidemic; 121 were seronegative. There was a high attack rate (61 out of 147) and a high rate of symptomatic disease (38 out of 147), which resulted in frequent physician visits (25 out of 38). Influenza accounted for 76 per cent of the sick-child visits during the two-month epidemic period. Young children undergoing primary influenza infection produced haemagglutination inhibition and antineuraminidase antibodies. Because of the immunologic responsiveness of young children, we examined the serologic correlates of protection. Ten children previously infected with influenza A/London and 16 who received live, attenuated A/Hong Kong ts-1(E) vaccine were protected against infection with the nonhomologous A/Port Chalmers strain. The morbidity of influenza and ability of the young child to produce protective antibody should encourage evaluation of live, attenuated influenza vaccines in this age group.

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