team at least once weekly to review the patients' progress. To be dynamic a day hospital must be continually discharging and accepting new patients and there should never be a waiting list. It is a great advantage if there are clear pathways between the day hospital and the various social day care facilities so that those who no longer need the therapeutic aspect of day care may continue to enjoy its social benefit.

ADVANTAGES

The advantages of the geriatric day hospital lie first in allowing the treatment of many elderly people without hospital admission, particularly when outpatient attendance at a physiotherapy department would be unsuitable. The need is for a continuing therapeutic environment where the pace is slower but activity continues throughout most of the day. The day hospital also allows the earlier discharge of patients and their subsequent supervision until they are safely settled at home. Another advantage is that the hours are attractive to staff and recruitment of suitable staff is often easier than to the inpatient wards.

PROBLEMS

Day hospitals are not without their problems. Probably the greatest of these lies in the provision of ambulance transport. It is exceptional for any patient needing day hospital treatment to be able to come independently. A few can be brought by relatives in cars, and in the occasional area taxis are hired for this purpose, but generally day hospitals must depend on the ambulance service for the delivery and returning home of their patients. This requires special and appropriate transport—for example, a vehicle with eight to ten seats with a hydraulic or other lift, good visibility for the passengers, safe seating, and good heating. Such a vehicle is likely to take between an hour and an hour and a half to collect its complement of patients and so those collected first may well spend upwards of an hour in the vehicle. For most of them this is of no hardship provided that the vehicle is appropriate, since it is likely to be the only time that they get out of their own homes.

It is essential that ambulances should bring patients to the day hospital and take them home according to a pre-arranged timetable and that vehicles are not used which are apt to be diverted for other purposes. The whole professional team in the day hospital awaits the arrival of the patients and if ambulance services are erratic there is an enormous waste of these professional resources. It is equally frustrating for the old person sitting for two or three hours awaiting the ambulance's arrival. Furthermore, patients coming to day hospitals are often relying on this as their only source of food that day, and perhaps of heating and other care. If the ambulance does not collect them they may suffer great hardship, as was shown in a survey of the effect of industrial action by the ambulance service on day hospital patients.⁵

Finally, what of the future? The day hospital is now firmly established and in due course every geriatric department will have one as an essential part of its service. There may be an increase of specialization within day hospitals, some developing more as day wards for medical and nursing treatment, others becoming the local stroke rehabilitation unit or orthopaedic rehabilitation unit for elderly people. Possibly some smaller day hospitals may be set up in association with community hospitals, where the emphasis will be on maintenance and social treatment. The day hospital serves as an excellent focus bringing together community medical care (the general-practitioner team) and the geriatric hospital team. The day hospital is in many ways a shop window for the geriatric service and undoubtedly a good one adds immeasurably to the morale of the whole geriatric department.

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Occasional Survey

Trade Names or Proper Names?—A Problem For the Prescriber

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Prescribers in Britain have a choice; they may prescribe medicine by an approved name, which has been given to the active ingredient of the medicine by the British Pharmacopoeia Commission; or they may prescribe using a trade name which identifies the product of a particular manufacturer. For some

commonly used drugs such as aspirin and digoxin there are many brands containing the same quantity of the same active ingredient.

Most doctors will have been taught to use approved names for drugs. In the past this has been recommended by the Department of Health and has been standard teaching for medical students. The first prescribing experience of doctors is in National Health Service Hospitals, whose pharmacists are often authorized to substitute an alternative brand of any drug prescribed; this cuts down the work of the pharmacy as well as that of the nurses administering the drugs by reducing the number of available brands of any drug. Considerable savings are also made by hospitals deciding to buy a single brand of a

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drug in bulk. For the house physician, there is little purpose in using trade names and he is likely to come to know drugs by their approved names.

Outside hospitals, on the other hand, substitution is not permitted. If a drug is prescribed by its trade name, the particular product indicated must be dispensed. There has been a steady increase in the proportion of drugs prescribed by trade names over the past twenty years so that 74% of prescriptions are now written in this way. Until recently, the decision of the prescriber outside hospitals seemed to be mainly based on economics. But it is now clear that there may be considerable variation in the effects of different formulations of the same drug. For example, a patient maintained on digoxin who takes a new prescription to the chemist may receive a brand which is absorbed either less well or better. The treatment may then be either ineffective or cause serious toxic effects.

How a doctor prescribes may now affect the outcome of his treatment. To consider the basis on which this decision should be made, a symposium was held on 18 September at St. Bartholomew's Hospital, attended by representatives of the pharmaceutical industry, pharmacists, and medical practitioners. This review is based on the discussion which took place with some personal comment.

Some Points of View

In the past the Department of Health, with the taxpayers' interests to consider, has advocated the use of approved names for the sake of economy. In 1964, the Department calculated that if all drugs were prescribed by approved names the saving, would be about 0.5% of the total drug bill¹. This calculation is no longer made because the Department now recognizes that the product dispensed when a drug is prescribed by the approved name may not be equivalent to the original product.² Opinions about the possible extent of savings vary but it is probably true to say that, though the sum involved is large, it is only a small percentage of the total drug bill and irrelevant as a potential economy when compared with problems such as overprescribing. Dr. G. CORNAH (Senior Medical Officer, Department of Health and Social Security) used the Department's figures for 1972 to show that a saving of just over £2 million would have resulted if four drugs—phenylbutazone, paracetamol, imipramine, and tetracycline—had been prescribed entirely by approved names. Mr. G. TEELING-SMITH (Director, Office of Health Economics) argued that these examples probably represented much of the potential saving but amounted to only a little over 1% of the total cost of drugs to the National Health Service. There are many drugs, including those still protected under patents, with which there would be no saving at all—and these tend to be the most expensive.

At present the pharmaceutical industry is the source of almost all new medicines. With each new product, a company must recover the cost of development as well as supporting research directed at finding new compounds and finance its failures. Not surprisingly, Mr. R. G. HOARE (President, A.B.P.I.), presenting the case for the industry, encouraged doctors to prescribe by trade names and said that even products which are not under patent could provide an important source of income for the industry.

Mr. G. R. HABERFIELD (a retail pharmacist) pointed out that retail pharmacists have a profit to make as well as a professional function to fulfil. For the former, they would prefer prescribing by trade names but, in any case, prescribing by approved names caused retail pharmacists greater problems than merely the necessity to obtain the cheapest available brand. In the case of a patient discharged from hospital controlled on warfarin or digoxin, the retail pharmacist, who knew that there were differences between brands, would prefer that the doctor identified the brand in his prescription. Dr. T. L. VENABLES (Lecturer in General Practice, University of Nottingham) said that, despite their training, most general practitioners used trade names; they did not have time to study the intricacies of

clinical trial reports in scientific journals, while the drug was identified by its trade name in many of the forms in which drug information reached them—for example, visits by representatives and advertisements. In fact, some family doctors complained that when they read scientific journals they were confused by the use of approved names for drugs which they identified by trade names.

In hospitals, where the same brand appears however the prescription is written, the arguments for approved names are usually the strongest. It is plainly pointless to prescribe in any other way and the use of trade names only increases the problems of pharmacists and nurses who process the prescription. Apart from economy, Professor D. W. VERE (Professor of Therapeutics, London Hospital) claimed that the approved name conveyed some information about the active ingredient of a medicine whereas the trade name told the doctor what it did: butobarbitone is a barbiturate but Soneryl makes you sleep.

It is also argued that the use of a common name for all products containing a particular ingredient facilitates communication between doctors; the toxicity of the active ingredient is less likely to be obscured or inappropriate therapeutic decisions made if the prescriber is aware of the nature of a medicine from its name. Everybody knows that ototoxicity is a danger of streptomycin and Professor L. P. GARROD (Emeritus Professor of Bacteriology, University of London) put forward evidence that this unpleasant toxic effect had sometimes been caused by the prescription of combination antibiotics with misleading names. These points may also be regarded as a criticism of trade names. There seems to be no good reason why a trade name should not give as much information about the active ingredient as the approved name. Nor is there any good reason why a doctor who knows that chloramphenicol causes aplastic anaemia should not be taught and remember instead that Chloromycetin does the same. The prescribing of any drug without knowledge of the effectiveness and toxicity of the active ingredient must surely be condemned.

Miss JANE STEVENSON (Ward sister, St. Bartholomew's Hospital), speaking for the busy nurse trying to administer the correct drug to the correct patient at a busy hospital, demanded that prescribing habits should be standardized, so that either trade names or approved names were used at all times. The containers from which medicines were dispensed should bear the same name as the prescription to avoid errors.

Mr. J. A. BAKER (Pharmacist, Westminster Hospital) thought that it was simply impossible for hospital pharmacies—which are already understaffed and often unable to carry out dispensing of all prescriptions written in hospital—to allow prescribing by trade names, which would require stocks of many different brands of each drug, individual containers of drugs for each patient instead of ward stocks, and many more pharmacists to do the work. For teaching, approved names are convenient though it will surely no longer be possible to allow medical students to gain the impression that an approved name gives sufficient information about any drug prescribed.

The Special Case

Not only must a medicine be shown by approved methods to contain the correct quantity of active ingredient, but also the active ingredient must reach its site of action—and it is clear that formulation may affect absorption. Present *in vitro* methods, measuring disintegration and dissolution of medicines, are not yet adequate to predict the properties of different formulations in man. Even blood levels do not provide a complete solution; though inadequate blood levels will expose a formulation which gives poor absorption, differences between profiles of absorption are difficult to interpret because the relation between blood levels and clinical effects is unknown in many cases. We do not know, for example, whether an analgesic which gives moderate levels for a long time is more or less effective than one which gives a brief high level. Products, prescribed by approved name, are not necessarily inferior, but they may be different; those

which produce higher blood levels, for example, may be either more effective or more toxic.

At the extremes of opinion, there are those who regard differences in bioavailability as a small and transient problem, and others who think that the problem is serious and requires attention. It is certainly not new: Manson³ pointed out in 1899 that sugar-coated quinine tablets might not be absorbed. For many drugs there is no information on the relative activity of different brands, but when studies have been carried out differences have often been found.

Professor A. H. BECKETT (Professor of Pharmacy, Chelsea College) and Professor PAUL TURNER (Professor of Clinical Pharmacology, St. Bartholomew's Hospital) listed those situations in which differences in bioavailability were likely to be important. These included advanced formulations; drugs with dose-dependent kinetics; sparingly soluble drugs and additives; drugs which were metabolized by gut flora; drugs given in small doses; replacement therapy; and drugs in which the range of therapeutic blood levels was narrow or close to the toxic level. The considerable problems which have already occurred with digoxin were reviewed by Dr. T. R. D. SHAW (Registrar in Cardiology, St. Bartholomew's Hospital) and important differences in many other areas were mentioned. Dr. H. L. F. CURREY (Reader in Rheumatology, London Hospital Medical School), discussing the antirheumatic drugs, favoured the use of approved names in most instances, arguing that differences in bioavailability of compounds such as aspirin could be easily overcome by change of dosage; his one exception was phenylbutazone, for which he thought differences in bioavailability justified prescribing by trade name—unfortunately for this compound the greatest economy could be achieved by the use of approved names.

Combination products deserve special consideration. Apart from the advantages and disadvantages of using combinations at all—which were reviewed by Dr. B. W. CROMIE (Chairman Hoechst Pharmaceuticals)—there is a powerful argument for using trade names when they are prescribed. Even in hospital, no one prescribes paracetamol 325 mg and dextropropoxyphene 32.5 mg when he can simply write Distalgescic. There are so many different combinations of simple analgesics alone, containing slightly different quantities of a few basic compounds, that it would be absurd to devise approved names for each combination when satisfactory names—the trade names—already exist.

Dr. J. C. GARNHAM (Director of Clinical Pharmacology, Lepetit), discussed another special case in which prescribing choice is not involved though identification of the product might affect subsequent use of drugs. This was the clinical trial, and one of the many reasons why clinical trials might have given divergent results in the past is that great liberties have been taken with formulation. For identical appearance, to ensure "double-blindness" of a trial, unknown drugs and standard compounds used for comparison have been encapsulated or reformulated in various ways without this important process being mentioned in the report or evidence of bioavailability given. A drug which has been reformulated for a clinical trial may give quite different effects when it is marketed. Similarly, evidence about a new drug shown to be superior to a reformulated standard compound can be accepted only if the standard was shown to be equivalent to the product which is used in practice. It is no longer sufficient to say that a new analgesic is better than aspirin without saying which formulation of aspirin.

The Solution

It has been suggested that when the bioavailability of a drug is known to vary it should be prescribed either with the name of the manufacturer as a suffix or by the trade name in order to identify a particular product or formulation of the compound. It is probably wiser to suggest that, unless the bioavailability of a

compound is known to be reasonably constant between brands, the brand or formulation should be identified by the prescriber.

At present the most convenient way of identifying a product is by its trade name. Identification of the manufacturer, an alternative suggested in the Sainsbury Report,⁴ has received little support since it involves an additional feat of memory on the part of the prescriber—who already has enough to remember. That the trade name is the most satisfactory method is supported by its widespread use in general practice.

Equivalence between brands cannot be accepted unless comparable drug absorption profiles in man or similar clinical and toxicological effects have been shown. If there is evidence that two brands are equivalent and a significant saving results from prescribing one or the other, prescribers should be so advised. Decisions about brands of drugs cannot at present be left to the pharmacist, who is not in a position to consider the medical needs of the patient. With the introduction of generic products in future, it is surely reasonable to expect that regulatory bodies will require as much information on bioavailability as that provided for the original product. It is also essential that evidence of equivalence or non-equivalence should be made available to the prescriber.

There is a potentially serious lack of communication between hospitals and general practitioners over the identification of products; unless available brands are known to be equivalent, the general practitioner should be told which brand of a drug a patient was receiving in hospital if he is expected to continue to prescribe. In hospitals, where substitution is essential with present pharmacy facilities, Mr. J. C. BARFIELD (Regional Pharmacist, S.E. Metropolitan Regional Hospital Board) suggested that a multidisciplinary drug selection team might prove useful to examine the evidence for equivalence of different products before a selection is made.

Consideration should be given to possible means of improving communication about drugs—for example, it would be little more difficult to devise trade names which gave more information about the active ingredient of the product, than to think of approved names for this purpose. Perhaps, where international communication is required, it will be necessary to replace all this jargon with the chemical identification of compounds and, when necessary, details of formulation and bioavailability. Mr. C. C. B. STEVENS (Vice-President, Pharmaceutical Society) reported experience of similar problems in other countries, and there seems to be a case for seeking some international agreement. In clinical trial reports, the product used should be identified, or, alternatively, details of formulation and evidence of equivalence with known brands, provided.

Many suggestions have been made about the setting up of organizations to study problems of bioavailability, regulate the marketing or prescribing of products, and inform the prescriber. Dr. D. G. GALTON (Consultant Physician, St. Bartholomew's Hospital) suggested a National Pharmaceutical Laboratory, whose function would be similar to the National Physical Laboratory but concerned with standards for drugs. Even trade name prescribing does not guarantee the bioavailability of a drug because there may be a batch-to-batch as well as product-to-product variation. Present *in vitro* methods do not adequately predict the behaviour of a compound *in vivo* and more co-operation among the pharmaceutical industry, pharmacists, and clinicians is needed to develop better methods. Mr. H. S. GRAINGER (Secretary, European Pharmacopoeia Commission) urged the development of standards which could be available in a pharmacopoeia. Some regulation, perhaps initiated from within the pharmaceutical industry, is desirable to limit the number of products of the same active ingredient. In the case of digoxin, for example, it is not in the interests of the patient that so many different brands should be available. Dr. W. H. LYLE (Medical Director, Dista Products) hoped that some facilities could be diverted from the production of many different brands of the same drugs for common diseases to greater research and development of drugs for rare diseases—which are being increasingly neglected. It is also desirable

either to restrict potentially dangerous preparations or at least to bring their dangers to the attention of prescribers. There can be little justification for combinations containing toxic drugs such as streptomycin. There is an understandable reluctance to introduce more statutory bodies or bureaucratic organizations, of which we already have enough. Nevertheless, this symposium proved to be a stimulating meeting point of the different specialists concerned in providing drugs for patients and it would be a pity if it did not lead to much wider cooperation among them.

References

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The proceedings of the symposium will be published in full in the *Postgraduate Medical Journal*.

Any Questions?

We publish below a selection of questions and answers of general interest

Sulphuric Acid Burns

What is the treatment of sulphuric acid burns? Can anything be done to prevent the skin staining that often results?

The first-aid treatment is to wash off the sulphuric acid as quickly as possible with plenty of water to try to prevent further deep damage. If available, buffer solution (a sterile mixture of 30 g of potassium dihydrogen phosphate and 220 g of bisodium hydrogen phosphate made up to a litre with water to a pH of 6.8 to 7) can be applied locally and repeated until the acid is neutralized. Buffer solution can also be used as a mouth wash or for irrigating the eyes when they are affected.¹ After the sulphuric acid has been washed off or neutralized and contaminated clothing removed the treatment of a sulphuric acid burn is the same as for any other burn.² If the burn has caused only partial loss of skin thickness it can be dressed with any of the recommended local applications until it heals (usually by three weeks). In cases of burns causing loss of full thickness of skin grafting may be required to repair the defect.

The amount of shock is related to the area of the burn. If it is larger than 10% of the area of the body in a child or 15% of the area of the body in an adult (excluding erythema) the usual intravenous plasma or dextran therapy will be required. Nothing can be done to prevent skin staining, but staining is not particularly common in burns caused by sulphuric acid only.

¹ *Encyclopaedia of Occupational Health and Safety*, Vol. II, p. 1372. Geneva, International Labour Office, 1972.

² Cason, J. S., *British Medical Journal*, 1959, 1, 827.

Depression and Parkinsonism

Are people who suffer from endogenous depression in middle age prone to develop Parkinsonism?

There is much current interest in the neuropharmacology of depression and Parkinsonism, but there is no clinical evidence to suggest that those with endogenous depression are more likely to develop idiopathic Parkinsonism in later life. There are, however, clinical associations between the two conditions. Patients with early Parkinsonism are often initially diagnosed as having primary depression because of their expressionless facies, poverty of movement, and apparent apathy, and they may indeed become secondarily depressed because of the insidious and apparently inexplicable restrictions upon their physical activities. Those with more evident disease who remain disabled despite combinations of the available medications may become understandably depressed too. The

situation may be further complicated by the fact that levodopa, now widely used in the management of Parkinsonism, may occasionally provoke depression though the patient's motor disabilities may have improved. This side effect ceases when levodopa is reduced in dose or withheld. In all the depressive states associated with Parkinsonism the tricyclic drugs may be beneficial, but those of the monoamine oxidase inhibitor series should not be given concurrently with levodopa.

Energy Costs

How many calories are used (1) by an average-sized man in walking for an hour at, say, 4 miles (6.4 kilometres) per hour and at 7 miles (11.3 kilometres) per hour; and (2) by an athlete in running a mile (1,600 metres) in four minutes?

The energy cost walking at 4 miles per hour of a man weighing 70 kg is 330 kcal. Walking at 7 miles per hour is impossible for the average man, he has to run. The energy cost at this speed would be about 700 kcal for 1 hour. Champion walkers can achieve such speeds. Their energy cost would probably be substantially higher—up to 1,000 kcal in one hour. An athlete running a mile in four minutes will consume about 20 l. oxygen—an energy expenditure of some 100 kcal. He will also incur an oxygen debt of about 4 l. oxygen, which is equivalent to 20 kcal.¹

¹ Durnin, J. V. G. A., and Passmore, R., *Energy Work and Leisure*, London, Heinemann Educational Books, 1967.

Anticoagulants in Cerebrovascular Disease

Should anticoagulant drugs be used in transient attacks caused by cerebrovascular disease?

It is important to try to determine the cause of transient cerebral ischaemic attacks before deciding on treatment. Such attacks may be caused by cardiac dysrhythmias and may be precipitated, if not perhaps caused, by anaemia or polycythaemia. Patients who have transient attacks in the distribution of the internal carotid artery, if they are under the age of 65 and are not hypertensive, should usually have a common carotid angiogram. This may show an atheromatous ulcer, with or without stenosis in the extracranial portion of the internal carotid artery. In such cases operative endarterectomy is usually indicated. If operation is not considered feasible or if the lesion is in the carotid siphon anticoagulant treatment is probably worthwhile.