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The elderly and their use of medicines

a review by

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Introduction

In 1982 the General Assembly of the United Nations convened a World Assembly on Ageing to call attention to the change which is taking place in the population structure of all the more developed countries and which will have some effect on the less developed ones too – the human race is growing older.

More and more people are living beyond the ages of 60, 70 and 80 years and fewer people are being born. The relative numbers of old people in the total population are increasing (Kerrigan, 1982).

The number of elderly people in the United Kingdom is about 15 per cent of the total population and it is projected that the number of those over 65 years will continue to rise until the end of the century. For the period 1971–1991 the projected increase is 37.5 per cent for those over 75 and 42 per cent for those over 85 years. At present 1 in 104 of the population is aged 85 and over; by the year 2001, it is likely to be 1 in 65 (Department of Health and Social Security, 1981).

Old age is no longer equated with physical frailty and with socio-economic dependence on others – this change can be directly attributed to advances in public health and medical technology over the last few decades.

At the same time, the gradual increase in general life expectancy has increased the relative and absolute numbers of the very old who do have special needs for care and protection and who represent a growing challenge to the socio-medical services and material resources of each country (Kerrigan, 1982). The recent government White Paper (DHSS, 1981) on the future pattern of care for the elderly in the United Kingdom concludes that most of these elderly people will have to be cared for in the community with the aid of family and voluntary organisations.

It is estimated that the elderly account for about one-third of the expenditure of the British National Health Service and an equivalent proportion of the cost of the pharmaceutical services (Judge and

Caird, 1978) yet ageing is not a disease and as such is not treatable by medicaments (WHO, 1981). However, the elderly suffer illness more frequently than younger people, with studies indicating that up to 80 per cent of those over 65 suffer from one or more chronic diseases compared with 40 per cent of those under 65 (Steinberg, 1978).

Multiple pathologies and degenerative changes tend to interact in the elderly, thus complicating their health status. The most common disorders are related to diseases of the cardiovascular system, whilst arthritis and associated conditions are the greatest single cause of impairment in handicapped old people (Profiles of the elderly, 1977). Many of these conditions can be controlled or alleviated by modern medical care.

One important aspect of medical care is the appropriate and safe use of drugs, which in the elderly requires special knowledge and skills if the benefits of treatment are to outweigh the risks. In this book we review published reports on the prescribing and use of drugs in the elderly and on the many factors which contribute to their optimal use.

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1983

The use and misuse of drugs by the elderly

Exact figures on the amount and nature of drugs used by the elderly in the United Kingdom are not readily available (Williamson, 1978) but it is certain that the use of both prescribed and non-prescribed medicines increases with age, with women taking more medicines than men (Adamson and Smith, 1978; Skegg et al, 1977). In the UK it is estimated that the over 65s are responsible for approximately 30 per cent of the NHS expenditure on prescriptions (Crooks et al, 1975) and in the USA for about 25 per cent of the drugs bill (Smith, 1979).

Although the taking of prescribed medications is more common, at least one study has shown that up to 80 per cent of elderly patients practise self-medication with non-prescribed drugs (Adamson and Smith, 1978) including herbal and 'natural' medicines (WHO, 1981). It appears that elderly people suffer from various discomforts which in most instances may be easily relieved by home remedies, the most commonly used products being laxatives, antacids, internal analgesics and cold preparations.

The placebo effect of some over-the-counter (OTC) medicines used by the elderly should not be underestimated (Holloway, 1974) but on the other hand, unacknowledged self-medication can be at the root of some drug interaction problems faced by an elderly patient. (Hall, 1975). A trend to increased OTC drug use with higher levels of education has been noted, together with the observation that patients who perceived their health as 'poor to fair' used less non-prescribed medicines than those whose health was considered 'good to excellent' (Adamson and Smith, 1978). This trend may show the greater need of the patient, who feels his health to be poor, for prescribed therapy. Another study associated various socio-economic factors, such as advertising, inaccessible physicians and/or lack of transport, and fear of medical procedures with the use of OTC medicines (Lenhart, 1976). A lack of knowledge about the products used and lack of concern about their use was observed by Adamson and Smith (1978), showing

that there is a need for education concerning non-prescription medication.

WHO (1981) acknowledges that self-medication is only one aspect of self-care and recognises that the encouragement of a rational programme of self-care is of great importance in meeting the demands for health care.

All types of medicines, whether prescribed or non-prescribed are open to abuse and misuse by those who take them. Illicit use of drugs by the elderly is acknowledged, but it is not thought to be a serious problem (Basen, 1977). An American study of 5500 substance abusers over 55 years of age showed that in 95 per cent of cases the drug of abuse was alcohol (Peppers and Stover, 1979).

A review of studies of moderate alcohol use shows that small daily amounts of alcohol intake may enhance the quality of life of the elderly, especially under institutional conditions (Turner et al 1981). Lamy (1980) has suggested that beer and sociotherapy may often be more effective than orthodox drug therapy, since it prompts increased social activity. However, few would go as far as this author when he points out that alcohol is an excellent sedative and deserves a place in the practical treatment of elderly patients with mental disorders, although he does warn the prescriber that he must be aware of drug-alcohol interactions and the possibility that the patient may be an alcoholic.

Potentially more hazardous is misuse created by the large quantities of drugs prescribed to the elderly and their taking of various drugs simultaneously (Basen, 1977). In addition to the sheer quantity prescribed, many patients receive fragmented care from several health-care professionals and are given multiple, possibly conflicting, prescriptions (Pascarelli, 1974).

At the same time, problems associated with hoarding medicines (Dunnell and Cartwright, 1972), improper storage and uncertainty about disposal (Law and Chalmers, 1976), and lack of practical information or instruction on safe and appropriate use (Basen, 1977) all enhance the possibility of misuse, particularly in the aged who may be suffering from impaired mental function. Given the disproportionately heavy use of drugs by the elderly, it is only reasonable to expect a certain amount of misuse, but its extent and the apparent

ineffectiveness of health-care professionals to prevent it is causing concern (Korcok, 1978). Over-utilisation of medicines is detected significantly more often in the over-65s (Solomon et al, 1974) but under-utilisation is also recognised as a hazard, and may be caused by social factors such as costs, transport, difficulties in opening containers and so on (Basen, 1977).

Drug therapy in elderly patients

Few doctors have special training in geriatric medicine and missed or misdiagnoses are, unfortunately, quite common (Williamson, 1978). There is a great need for more geriatricians (Basen, 1977) but all physicians should aim at better diagnosis and more adequate treatment for the elderly, with as little delay as possible, bearing in mind that social and physical therapies may often be more appropriate than the prescribing of drugs (Anderson, 1976).

Many of the drugs prescribed for elderly patients are given, not for recognised syndromes, but for symptoms related to the multiple changes and diseases associated with the ageing process. In addition, the elderly have difficulties in adapting to their physical, psychological and social environments, which may be expressed as symptoms. Therefore, it is important to recognise that symptoms in elderly patients do not invariably require the use of drugs and even when they are indicated they must be used carefully (WHO, 1981).

When drug therapy is selected, it should be remembered that little is known about the utilisation of drugs in the elderly (Anderson, 1976) and that much more research in geriatric pharmacology is required (Basen, 1977). Many of the risks and complications of drug treatment in elderly people are related not only to the biopharmaceutic parameters affected by increasing age, and to deteriorating mental and physical faculties which may produce untoward, bizarre or exaggerated effects (Holloway, 1974) but also to social factors which may isolate the aged from medical advice (Shaw and Opit, 1976).

Pharmacological considerations

The effect of any drug upon a tissue is dependent on its concentration in bioavailable form at the site and on the sensitivity of the tissue to the drug. Variations in these factors are determined by the absorption, distribution, metabolism and excretion of the drug which are all

influenced by various physiological and anatomical changes in older people, thus producing altered responses to drugs (Holloway, 1974; Stanaszek, 1974).

Castleden et al (1977) has shown no change in the rate or amount of drug absorption from the gastrointestinal tract with ageing but it is acknowledged that there is a paucity of information on this subject in relation to age (Williamson, 1978).

Distribution may be delayed as a result of decline in the cardiovascular system (Anderson, 1976) and there is a greater danger in older patients of toxic drug levels being reached because of fewer binding sites (Williamson, 1978). The elderly are more susceptible to drug competition when two or more drugs are given, owing to changes in protein binding, so that a drug may interfere with the action of another, or displace it (Anderson, 1976). The dangers of drug interactions have been well documented.

Metabolism may be decreased, since the ageing liver cannot metabolise drugs as speedily and efficiently as in youth (Castleden and George, 1979). This in turn may contribute to the high incidence of adverse reactions in the elderly, although it is recognised that genetic factors are also important here (Williamson, 1978).

Excretion can be reduced by impaired renal function and delayed by decreased metabolism, thus predisposing elderly patients to toxic reactions (Anderson, 1976; Williamson, 1978).

Specific studies relating age to changes in the pharmacokinetics of propranolol, digoxin, quinidine, warfarin, lithium, benzodiazepines, theophylline, cimetidine, phenytoin and kanamycin are available and it is evident from these studies that decreased drug clearance in the elderly may merit a compensatory reduction in dosage especially for drugs with a narrow therapeutic index (Schumacher, 1980).

Ritschel (1980) has tabulated the changes of drug kinetic parameters in the aged and concluded that a generalised pattern is seen only for renal elimination of unchanged drugs as a function of age. Any alteration in dosage regimen for the aged can therefore only be regarded as suggested optimal doses and needs verification by drug monitoring.

Evidence that the pharmacokinetics of drugs in the body are altered in the elderly is important, but there are many variations between

drugs and the way different people react and the main findings to date are inconsistent. The difference between biological and chronological ageing makes the elderly a remarkably heterogeneous group. Furthermore the effects of ageing have not been separated from environmental influences, such as reduced smoking, altered diet or living in an institution. Impaired homeostasis is generally accepted as one reason why many drugs cause or worsen confusion, postural hypotension, hypothermia and falls in the elderly. These phenomena have received little formal study and the line between ageing *per se* and early disease is not easily drawn (Ramsey and Tucker, 1981).

Since it is not yet possible to draw firm guidelines on the effects of ageing on drug pharmacokinetics and dynamics, many more carefully designed studies are required involving normal healthy elderly volunteers (WHO, 1981).

Adverse reactions and iatrogenic disease

The incidence of adverse reactions to drug therapy in the elderly has two components; one is related to the pattern of prescribing for the elderly and might yield to changes in prescribing habits. The other is the propensity of the patients to react adversely to certain individual drugs (Ramsey and Tucker, 1981).

A study which sought predisposing factors in patients who developed adverse drug reactions in hospital showed that more patients of 60 years and over, and more women than men, developed such reactions. Patients with reactions were also taking more drugs than patients without them (Hurwitz, 1969). Ramsey and Tucker (1981) argue that if the elderly have a genuine need for more drugs than the young, as seems probable, they will inevitably pay some price for effective treatment. As a rule of thumb the risks of adverse drug reactions are increased by a factor of 2.5 over the age of 65 years (George, 1981) and the incidence of drug reactions and interactions rises with the number of drugs taken (Judge and Caird, 1978). One study showed that 10 per cent of admissions to geriatric wards are due to iatrogenic disease caused by drugs (Williamson, 1978a).

Drugs singled out as causing adverse reactions in the elderly and thus requiring special care in prescribing include diuretics, hypoten-

sive agents, digoxin, hypnotics and tranquillizers, antidepressants, anti-Parkinsonian drugs and those with anticholinergic effects (Jarvis, 1981; Williamson and Chopin, 1980; British National Formulary, 1982; Ramsey and Tucker, 1981; Lyle and Hayhoe, 1976).

If the adverse effects of drugs become worse than the symptoms of the disease they are supposed to control, then consideration should be given to stopping long-term therapy (Hall, 1975). In fact, elderly patients may very often benefit more from the physician stopping their drugs than starting them (Anderson, 1976; British National Formulary, 1982), although it must be remembered that many old people are creatures of habit and it may be difficult or unkind to do so.

Studies have shown that the person most likely to have a drug-induced illness is elderly, with freely prescribed tranquillizers, hypnotics and antibiotics accounting for many of the fatalities (Basen, 1977). The particular problems of good compliance with drug regimens and possible iatrogenic overdose in the elderly must be seriously considered (Keet, 1976).

Multiple therapy and drug interactions

The elderly receive more drugs because of a higher incidence of disease (Crooks et al, 1975) and because they have multiple illnesses and complaints, they are prone to receive multiple drug therapy (Williamson, 1978).

It has been shown that medication errors increase rapidly as the number of prescribed drugs rises (Macdonald et al, 1977). The common problems of ageing – failing eyesight, hearing or memory – combined with multiple drug therapy render the elderly vulnerable to errors in self-administration of drugs.

The importance of potential drug interactions in elderly patients is recognised and their increasing complexity acknowledged. In one study in the USA a computerised screening programme has been developed for potential drug-drug interactions and used to screen geriatric patient drug profiles maintained by a pharmacy serving 132 nursing homes. In this study 362 potential drug-drug interactions were identified involving 16 interacting groups of drugs (Armstrong et al, 1980).

Some of the main risks of drug interactions involve the patients own self-prescribed medications. The danger of sudden changes in long-standing drug regimens has been pointed out (Hall, 1975; Williamson, 1978).

Problem drugs in the elderly

Drugs used to treat cardiovascular disease and psychotropic drugs appear to be the most commonly prescribed (Shaw and Opit, 1976). Use of the latter group of drugs in the aged is singled out for study. In the USA the National Institute on Drug Abuse has produced a major report which reviews the pattern of use of psychotropic drugs by the elderly. The study indicates that the elderly receive a disproportionately high number of prescriptions for psychotropic drugs, especially sedatives and hypnotics, but highlights the problem of comparable data from individual studies and points to the need for systematic research in this area. The report also includes a review of the prevention and treatment programmes for drug misuse among the elderly in the USA (National Institute on Drug Abuse, 1979).

Jacoby (1981) has considered the problem of depression in the elderly and concludes that while physical disease and social deprivation might seem to explain the susceptibility of the elderly to serious depressive illness, there is still much to be learned about the aetiology. Response to treatment in the short term is good but the long-term outcome is one of high morbidity.

Goldson (1981) has considered the management of sleep problems in the elderly and stresses that the cause must be investigated. He suggests that the cause could well be anxiety, depression, somatic discomfort, chronic brain failure or acute confusional states. In the absence of a specific treatable cause, efforts should be directed towards explanation of and reassurances about changes in sleep rhythms. He recommends that drug treatment should be of short duration only to restore the sleep pattern and emphasis should be placed on the harmless effect of imperfect sleep.

A brief review of work on hypertension in the over 60s has been published (Hypertension in the over 60s, 1980) and it stresses that drug treatment should only be given when the patient can be relied upon to

take it correctly, be well supervised and only when the doctor is prepared to monitor the blood pressure (Jarvis, 1981).

Other publications deal with the problems encountered in the use of nitroglycerin and hypnotics (Isler, 1977), digoxin (Marsh and Perlman, 1972), hypotensives (Macdonald et al, 1977) and the most frequently used OTC medications (Adamson and Smith, 1978; Plant, 1977). A main review (Holloway, 1974) deals with problems in the use of a wide variety of drugs prescribed to elderly patients.

Prescribing drugs for the elderly

All physicians should know the therapeutic dose, adverse effects and any special precautions necessary for all drugs they prescribe, and this practice is particularly desirable when dealing with older patients (Anderson, 1976). Physicians should not underestimate the importance of the doctor-patient relationship in therapy and should realise that success very often depends on the confidence of the patient in his doctor (Anderson, 1974; Hall, 1975). Favourable patient morale is promoted by emphasising clinical improvement or success in therapy, even if the change is small (Judge and Caird, 1978).

It is important for the physician to familiarise himself with the nature and circumstances of his patient's illness, including previous drug history, which must be carefully elicited using leading questions if necessary, as many old people do not regard certain agents as 'drugs' (Anderson, 1976). It is also important for the physician to remember that self-medication is likely to be taking place (British National Formulary, 1982; Drugs in the elderly, 1978).

Jarvis (1981) emphasises that accurate diagnosis is essential if drug therapy is to be helpful rather than useless or harmful, and Hall (1973) stresses that the physician must know the pharmacology of the drugs prescribed.

Regimen

Medication regimens for the elderly should always be as simple as possible, using the fewest possible drugs in the lowest possible doses, timed to coincide with regular occurrences in the patient's usual day (Anderson, 1974; Scottish Health Services Planning Council, 1981). Complicated schedules are very difficult for the elderly to follow (British National Formulary, 1982) and it is felt that many medication regimens must be a considerable mental strain and source of anxiety to most elderly patients (Macdonald et al, 1977). Consequently, the type

of regimen may affect compliance, and indeed the complexity of prescribed regimens was found to be an influencing factor in at least one study (Parkin et al, 1976).

Physicians should ensure that patients understand the purpose, dosage and frequency of administration of their drugs (Williamson, 1978) and should only prescribe a sensible quantity at any one time (Anderson, 1974).

Wandless et al (1979) and Kiernan and Isaacs (1980) have shown that compliance errors are more common when medicines are to be taken more than once daily, yet many drugs which could be given as a single daily dose are needlessly prescribed in divided doses, for example, many beta-blockers, diuretics and corticosteroids (Helping elderly patients, 1980). Kiernan and Isaacs (1980) recommend that the dose be given in the morning because it is more regularly adhered to than an evening dose.

Diuretics may best be given as a single dose in the morning but psychotropic drugs given at night as a single dose may well avoid troublesome adverse reactions since the patient would be asleep when these effects would be most bothersome (WHO, 1981). However, caution is needed because the day's treatment is lost if a dose is missed (Lamy, 1980).

Combined drug preparations are a possible solution to compliance problems where multiple therapy is indicated but they reduce the flexibility of dosage (British National Formulary, 1982) although Parkin et al (1976) feel that they may have benefits which outweigh their theoretical disadvantages.

As aids to prescribing at least one book has been published as a useful guide to those who prescribe for the elderly. It deals exclusively with the clinical problems requiring drug therapy in the elderly and with important groups of drugs used in the treatment of disease in old age (Judge and Caird, 1978).

It has been suggested that the British National Formulary should include a special section on geriatric prescribing similar to that for paediatric prescribing, particularly for patients over 75 years of age (Bliss, 1981).

No drug should be administered without good reason (Wade, 1972) and occasionally the intelligent use of a placebo could be considered in

elderly people (Williamson, 1978). On the other hand, no needed drug should be withheld on grounds of old age (Hall, 1973) when adjusted dosage and/or method of administration may be all that is necessary for effectiveness (Anderson, 1976). In geriatric patients the lowest effective dose of any drug should always be used (Hall, 1973).

It is considered best to start with small doses and titrate the dose to the patients response (Vestal, 1978). Diminished body weight should be a significant factor when deciding the dose (Cook, 1979). Reduction in dosage of all drugs is not necessary but Swift (1979) calls for urgent research to establish factual information concerning individual drugs, which should be clearly incorporated and displayed in manufacturers drug data sheets together with some basic pharmacokinetics details.

It should be remembered that it is rarely possible to treat all symptoms simultaneously (Anderson, 1976). One writer recommends that the underlying disease, rather than the symptoms, should always be treated (Hall, 1973). Others advocate restraint in the treatment of old people, with occasional concentration on the relief of symptoms, particularly when adverse effects to drugs may become more unpleasant than the symptoms they are designed to alleviate (Williamson, 1978). Jarvis (1981) points out that treating symptomless diseases such as diabetes or hypertension in the elderly could make the patient much worse if injudicious treatment leads to hypoglycaemia or hypotension.

Primary/secondary care

Physicians' prescribing habits seem to vary considerably between hospital and community (Lamy and Kitler, 1971) and the situation which arises at the interface between primary and secondary care is fraught with problems.

In the United Kingdom Bliss (1981) sees the separate funds for general practice and hospital drugs as a major contributing factor. At present pharmacists are reimbursed for drugs prescribed by general practitioners and for drugs prescribed in hospitals out of two separate NHS funds. Practitioners' prescriptions are paid for out of an 'unlimited' general prescribing fund while hospital prescriptions, whether dispensed in the hospital pharmacy or outside, are paid for out of the

general budget of that particular hospital. It is not surprising therefore that management committees are trying to save money by limiting the amount of medicines prescribed by hospital doctors for outpatients, or for patients leaving hospital.

The patient leaves hospital with one week's supply of drugs, at the same time a letter is sent to his general practitioner telling him what drugs the patient is taking. The patient then has to go to his doctor to obtain further supplies and it is very likely that the tablets will not be the same size, shape or colour (Atkinson et al, 1978; Gibson, 1974). Often because they have not been told otherwise patients will also request drugs they were receiving before admission to hospital (Drury et al, 1976). Hospital doctors are, therefore, urged to take into account the drug routine which a patient may have been following before being admitted to hospital (Parkin et al, 1976).

The authors of the British National Formulary (1982) recognise the problems and state that special care is necessary when more than one prescriber is involved. Ideally all prescribing should be in the hands of a single doctor, otherwise it is important that all communications between hospital and general practitioners (in either direction) should include a complete list of drugs and doses prescribed (Ramsey and Tucker, 1981; Atkinson et al, 1978; Parkin et al, 1976).

Drug cooperation cards could improve the situation (Helping elderly patients, 1980; Bliss, 1981) and physicians could encourage patients at follow-up visits to return all their remaining medication. This would prevent hoarding and duplication of regimens as well as checking compliance (Helping elderly patients, 1980).

Monitoring

Finally, there is some consensus that the physician's responsibility extends beyond the initial prescribing of drugs, and that he should monitor the treatment for efficacy and adverse reactions keeping the continuation of the regimen constantly under review (Hall, 1975; Williamson, 1978).

Repeat prescriptions should not be issued routinely until the correct dosage has been established (British National Formulary, 1982) and

some writers feel that they should be abolished altogether (Gibson, 1974; Williamson, 1978).

A study of repeat prescribing for patients over 65 showed that 10 per cent of drugs were no longer necessary and 28 per cent were equivocal (Tullock, 1981). Most writers urge a systematic continual review of long term drug treatments (Tullock, 1981; British National Formulary, 1982) and that those drugs which are not needed should be discontinued (Helping elderly patients, 1980; George, 1981; Vestal, 1978).

Various manual methods of controlling the number of repeat prescriptions a patient may receive without seeing the doctor are outlined (Stevenson, 1967; Drury, 1973; Cruikshank and Moir, 1979) and a computer assisted record method is also described (Bain and Haines, 1975).

Knox (1980) reviewed the literature on prescribing to the elderly and stated that there is little agreement concerning the frequency of occurrences of adverse drug reaction and called for more studies of prescribing in general practice.

Presentation and packaging

It seems illogical to insist on rigorous controls in the manufacture, testing and purity of drugs if they are then supplied to the patient in a fashion which can result in enormous errors (Williamson, 1978) and ineffective or hazardous treatment (Wade, 1972). The pharmaceutical industry has appealed for cooperation and advice from health-care professionals, biochemists and clinical pharmacologists as regards the formulation and presentation of drugs for the elderly. The packaging and presentation of medicines is known to affect compliance with regimens (Keet, 1976) and patients' ability correctly to self-administer their medications. Older people are often unable to swallow tablets, in which case effervescent tablets or liquid preparations may be preferable (Anderson, 1976; WHO, 1981), although liquid medicines dispensed in large bottles may prove difficult for the elderly to shake and measure out (Helping elderly patients, 1980). The suggestion has been made that 5ml dispensers might be fitted to standard containers (Scottish Health Service Planning Council, 1981).

The use of suppositories is often a valuable alternative route of administration when the patient is unable to swallow or retain drugs by mouth or when they have little muscle mass and injections would be painful and difficult (Judge and Caird, 1978; WHO, 1981).

Recommendations are made concerning the significance of taste and colour of medicines (Atkinson et al, 1978) and the point made that many elderly people expect medicines to taste horrible if they are to be beneficial (Arthur, 1974).

The size and shape of many drug preparations make them very difficult for some elderly patients to take (Law and Chalmers, 1976). It should be remembered that many old people tend to tip out the contents of capsules and find difficulty in breaking tablets down to a manageable size (Arthur, 1974). On the other hand they may have difficulty in picking up small round tablets (Helping elderly patients,

1980). Where multiple drugs are prescribed, preparations should be of different colours and shapes (WHO, 1981).

Containers

A survey of eleven different types of container and packaging for tablets (Davidson, 1973) showed that the more traditional glass containers with screw or snap tops were the most satisfactory, although patients with significant visual or intellectual impairment or reduced manual dexterity found even these difficult to use. Elderly patients usually identify tablets by colour and size, which is only possible if the container is transparent, and disposable plastic containers were found to crack when grasped firmly. At one time it was felt that tear-off and bubble packs containing the required tablets might assist the elderly to take their drugs correctly (Wade, 1972), but Davidson (1973) has shown that they are in fact quite difficult for elderly patients to use.

It is now well established that elderly and arthritic patients have difficulty in coping with child-resistant containers (CRCs) (Child-resistant containers, 1979; Alexander, 1980; Bellamy et al, 1981). A recent study by Bellamy et al (1981a) showed that in addition many elderly people could not adequately close screw-capped containers. These authors call for a new design which relies on knowledge of the mechanism rather than physical strength or intricate manipulative skills and incorporates a feature limiting the number of doses available at each opening.

The same authors in another study call for a container specifically designed for the elderly which is easy to open and has a moisture-tight seal to retain the stability of the contents (Bellamy et al, 1981).

Meanwhile all health care staff should be aware that CRCs are a potential source of medication error. Pharmacists should try to identify patients who cannot use CRCs and supply alternatives, and doctors should help by writing the necessary instructions on the prescription (Burns and Jenkinson, 1980).

Medication aids have been developed to help those patients who take several different types of drug every day. One such aid, the Dosett dispensing box, displays up to a week's supply of tablets and capsules in a closed plastic container for four dose-times per day. These aids

have been evaluated in the USA and have been shown to improve compliance in patients attending a hypertension clinic (Rehder et al, 1980). In the UK a small trial of limited duration on the women's rehabilitation ward of a geriatric department was unable to show any increase in compliance but the authors think it unwise to dismiss this type of container (Crome et al, 1980). Keet (1976) and Law and Chalmers (1976) suggest that cost effective studies are required because they are very expensive. Nevertheless the authors of the Drug and Therapeutics Bulletin recommend their use (Helping elderly patients, 1980).

A suggestion for using different shaped containers and/or different coloured stoppers for doses at different times of the day is also made (Freeman, 1974).

Labelling

The question of adequate and sensible labelling of medicines for the elderly is raised (Wade, 1972). Two studies have shown that 50 per cent of medication containers provided in general practice and taken to a geriatric outpatient clinic had no dosage directions (Bliss, 1981) and 73 per cent of the labels on medicines taken regularly by 81 elderly patients in one practice stated 'take as directed' (Wandless et al, 1979). It is strongly recommended that dosage instructions should be clearly written on all repeat prescription forms so that the drugs can be labelled properly by the pharmacist (Scottish Health Service Planning Council, 1981).

The labels should always be clearly legible, typed in large print (Anderson, 1974), include dispensing and expiry dates (Law and Chalmers, 1976; Kiernan and Isaacs, 1980), number of tablets dispensed (Helping elderly patients, 1980) and the name and strength of the drug.

Directions for use should be simple but specific, using words patients understand, preferably relating to mealtimes, rising or retiring – that is, signposts in the patients' daily routine which make it easier to remember their medications (Kelly, 1972; Helping elderly patients, 1980). The purpose of the medication should also be included to help patients take medicines for the right reason (Helping

elderly patients, 1980). In one hospital study, generic names were included where possible to avoid patients having several bottles of the same drug labelled differently (Palmer, 1979).

The aim of all labelling, in itself the simplest form of written communication between health-care professionals and patients, should always be to give clear and simple instructions to patients about their medication (Wade, 1972). Many authors emphasise the need to reinforce such written instructions with verbal counselling and vice versa (Anderson, 1974) in an attempt to reduce both non-comprehension and non-compliance (Parkin et al, 1976). In addition pharmacists should ensure that patients can read and understand the label (Helping elderly patients, 1980) but as many elderly people do not collect their own medication this opportunity does not always occur (Steane, 1979).

Medication errors, compliance and self-administration

The main review articles in this field agree that age is an important factor in medication error and non-compliant behaviour (Fox, 1962; Sackett and Haynes, 1976; Stewart and Cluff, 1972). Two further reviews specifically consider the problems of the elderly (Curtis, 1961; Keet, 1976).

Patients seem to fall into three groups with regard to their ability to manage their own drug therapy: those who are meticulous, those who can be trained and those who will always make errors (Hall, 1975).

Many methods have been used to determine compliance errors (Fox, 1962) including pill counts, urine samples, hospital charts and interviewing techniques (Schwartz et al, 1962; Stewart and Cluff, 1972).

Wandless et al (1979) state that a combination of prescription record inspection and interview assessment can be used with 86 per cent accuracy to spot patients who are not taking their medicines.

Identifying potential error-makers and predicting potential non-compliance would have obvious benefits for the effectiveness of drug therapy (Keet, 1976). However, various attempts to establish significant socio-demographic variables have been unsuccessful. It would appear that there is little association between error-making and sex, race, marital status, social isolation, educational levels, or employment of the patients concerned (Marsh and Perlman, 1972; Neely and Patrick, 1968; Parkin et al, 1976; Schwartz et al, 1962). Individual assessment of every patient is obviously essential (Schwartz et al, 1962).

The most commonly found types of error include inaccurate dosage, omission of medication altogether, improper timing or sequence and inappropriate self-medication with non-prescribed drugs (Holloway, 1974; Schwartz, 1975).

Reasons for error and non-compliance are varied and complex and include physical, mental, psychological, and social factors. Physical

problems caused by the illness itself or infirmity may involve disabilities such as poor vision, tiredness or impaired manual dexterity (Holloway, 1974; Isler, 1977; Sackett and Haynes, 1976) and may be particularly severe in elderly people suffering from multiple disorders (Korcok, 1978) who are receiving multiple therapies (WHO, 1981). The appearance of unexpected side effects (Keet, 1976) or the early disappearance of symptoms (Schwartz, 1975) may cause patients to deviate from their regimens and may be associated with inadvertent duplication of medication, particularly when both prescribed and non-prescribed drugs are being taken simultaneously (Korcok, 1978). Psychological factors such as personality (Keet, 1976), motivation (Keet, 1976; Korcok, 1978) and understanding (Marsh and Perlman, 1972; Parkin et al, 1976) demand fuller assessment and could be especially important in the elderly whose attitudes may be more rigid (Keet, 1976). Impaired mental ability makes it almost impossible for some elderly patients to follow their regimens accurately (Keet, 1976; Shaw and Opit, 1976), causing forgetfulness (Holloway, 1974; Sackett and Haynes, 1976) and other problems. It has been estimated that 20 per cent of patients over 80 years old are demented (Crooks et al, 1975). The elderly are prone to hoard their medications (Korcok, 1978) and then to use old drugs inappropriately (Macdonald et al, 1977; Parkin et al, 1976; Wade, 1972) and also to share medicines with other people (Korcok, 1978; Macdonald et al, 1977). They may run out of their supply (Holloway, 1974) or mix different drugs in one container (Korcok, 1978). On the other hand, external factors such as poor record keeping by health-care professionals (Law and Chalmers, 1976) particularly where repeat prescriptions are concerned (Keet, 1976), inadequate labelling (Holloway, 1974; Korcok, 1978) packaging and presentation (Keet, 1976) or the prescribing of over-complicated regimens (Keet, 1976; Macdonald et al, 1977; Parkin et al, 1976; Schwartz, 1975) may all contribute to the problem, as may the patients' knowledge of the nature and purpose of their medications (Holloway, 1974; McKercher and Rusker, 1977; Parkin et al, 1976; Schwartz, 1975; Stewart and Cluff, 1972), and the availability or lack of adequate instruction in their safe and appropriate use (Korcok, 1978; Schwartz et al, 1962).

It has been stated that poor understanding of prescription direc-

tions is a problem (Ramsey and Tucker, 1981) but evidence is given in one study that despite only 25 per cent of medications being clearly labelled, 92 per cent of patients knew the correct dose regimen and 72 per cent the correct purpose for all medicines taken, so poor labelling could not be considered responsible for compliance errors (Wandless et al, 1979).

Suggested solutions to errors and non-compliance are as varied as the manifestations of the problem itself and include ideas concerning the patients themselves, the medications and the health-care professionals involved. The consensus is that family, friends, neighbours and home helps should all be encouraged to give assistance in reminding patients to adhere to treatment (Scottish Health Service Planning Council, 1981). Use of compliance aids such as the Dosett box type may help a family to remind a patient to take their medication (Rehder et al, 1980).

In evaluating medication review forms, home helps have been found successful in making assessments of patient's ability to comprehend prescription instructions and to comply with those instructions (Shimp et al, 1980).

Many patients devise their own memory aids, such as setting out doses for a day or a week (for example in egg boxes). It is also suggested that relatives and home helps could do this (Helping elderly patients, 1980).

One of the critical times for medication error appears to be the transition from primary care to secondary care and back again. For example, the number of prescribing physicians and dispensing pharmacists seen by a patient has been positively correlated to compliance errors (Raffoul et al, 1981).

One successful way of increasing patient compliance in the community and reducing errors is the practice of encouraging patients to take responsibility for their own self-administration of medicines while still in hospital (Stewart and Cluff, 1972). Experiments with self-administration have been frequently reported. These are designed to give the elderly practice in the correct use of their medicines before they return home (Atkinson et al, 1978; Davidson, 1974; Isler, 1977). Some of the advantages are seen to be an opportunity to educate patients in drug use, to tailor regimens to suit individual

patients, to increase the independence of some patients and also an opportunity for medical staff to discover the commonest types of error committed (Kelly, 1972; Libow and Mehl, 1970). It helps to identify patients who are likely to fail to take their medication at home because of physical or mental impairment so that community services and relatives can be alerted to the possibility of non-compliance at the outset (Crome et al, 1980).

The pharmacist can assess the type of container the patient can use and whether he/she can read the label. The hospital pharmacist also has the opportunity to show the medicines to the patient and explain their purpose and he can also contact the patient's local pharmacist to ensure that future supplies are presented in an appropriate manner (Baxendale et al, 1978).

In addition, some authors advocate more supervision for elderly patients in taking their medicines to ensure that they are taken correctly (Anderson, 1974; Hall, 1975). One such study has shown that monthly visits by a nurse to elderly people living at home ensures an optimal use of medication (Linn and Taylor, 1979).

Many elderly patients living at home have potent drugs prescribed for them when they are mentally unfit to be responsible for their use (Shaw and Opit, 1976). In such cases it is imperative that a responsible relative should be in charge of the drug treatment. Alternatively it may be necessary to ask the community nurse to administer the medication (WHO, 1981).

Geriatric education of health-care professionals

There is a need for improved professional education in geriatric drug therapy if some of the existing problems are to be solved (Wade, 1972). More emphatically a call has been made for geriatric medicine to be incorporated in the basic training of medical students, pharmacists, nurses and other health professionals so that old age is viewed as a natural part of the human life cycle (Butler, 1980).

To this end, medical schools have established departments, divisios and programmes in geriatric medicine and gerontology (Butler, 1980), and geriatric medicine is on the short list of hospital-based specialities that are written into the mandatory vocational training regulations for general practice in the United Kingdom (Josse, 1981).

British and American studies have shown that including geriatric medicine in the curriculum improves students' attitudes to the elderly, but the authors note that the negative attitude of the medical profession towards the elderly undermines the effectiveness of medical education in geriatrics (Chin et al, 1981; Wilson and Hafferty, 1980).

Some schools of pharmacy in the USA are also offering geriatric programmes (Butler, 1980) and recommendations are made for increasing the geriatric aspects of pharmacy curricula (Staples, 1980).

Health-care professionals and drug education

Conferences held for health professionals have indicated that many resist the concept of encouraging the elderly to participate actively in their own drug therapy, since they believe them to be confused, with poor eyesight and so on (Plant, 1977). It has also been noted that many personnel tend to react with some resistance to factual information about medication errors – an understandable human tendency which should nevertheless be combated (Schwartz et al, 1962). New attitudes towards drug prescribing and management for the elderly

are obviously needed on the part of physicians, pharmacists, nurses, educators and social workers (Korcok, 1978), all of whom may feel that the responsibility for educating the elderly about drugs is primarily theirs alone. But the physician is the key person and without his specific directions there is a limit to what the pharmacist and nurse can teach. Lundin et al (1980) argue that if the prescriber is not wholly familiar with the medication he should provide the pharmacist with the data and goal of therapy and delegate him to complete and clarify the instructions. The nurse can be delegated in the same manner.

Physicians should fully realise the importance of the doctor-patient relationship (Hall, 1975) where the length of association between the two, together with a positive attitude on the part of the physician, are felt to have considerable influence on the way elderly people take their medicines (Keet, 1976).

By improving their prescribing habits and coordinating their care physicians could make a considerable contribution to solving drug-related problems. At the same time, regular review of treatment is an important aspect of physician care (Hall, 1975; Holloway, 1974), bearing in mind that intensive checks on self-administration and compliance might easily damage the doctor-patient relationship (Fox, 1962).

Clearly, in primary care, doctors and pharmacists share the responsibility for giving patients adequate information about medicines and a check list has been published to help physicians remember what the patient needs to know, including items that the pharmacist can reinforce when he dispenses the prescription. This includes when and how to take medication, what to do if a dose is missed, possible effects on driving and what precautions to take, and possible interactions with alcohol and other drugs. In addition the author suggests that pharmacists should instruct patients on safe storage and disposal of medicines (What should we tell patients about their medicines?, 1981).

Pharmacists are seeking new roles and responsibilities in the area of geriatric care and various opportunities for effective communication between pharmacists and older patients are suggested (Stanaszek, 1974) together with ideas for new ways in which pharmacists

can become involved in the home care of the elderly (Frisk and Simonson, 1977). Pharmacists are often unaware of the total amount of drugs taken by elderly people (Adamson and Smith, 1978) and there is an obvious need for closer liaison between patients and pharmacists, and between other health-care professionals and pharmacists who could provide inservice education on drug use to such personnel (Frisk and Simonson, 1977).

Nurses, because of their very special position in the care of old people in hospital, consider that they should undertake drug education for the elderly, especially through self-administration programmes prior to discharge (Isler, 1977; Kelly, 1972). Responsibilities of the nurse might include assessing changes in symptoms or behaviour, intervening if necessary to avoid duplication of medicines, monitoring responses to drug therapy and teaching correct use of drugs (Lenhart, 1976).

The functions of community nurses, as well as their hospital colleagues, are also commented upon (Crooks et al, 1975; Neely and Patrick, 1968). One study has shown that monthly visits by a nurse to elderly patients at home, to check medication, can correct the problems of duplication of prescriptions by general practitioners and hospital doctors. Nurses can also check labelling of medication and notify the doctor of any lack of clarity in directions for administration and request cooperation in providing more precise instructions. In addition, by giving advice on diet and so on, nurses may reduce drug use and contribute to the general improvement of patients (Linn and Taylor, 1979).

Occupational therapists are also considered to be in a good position to teach patients this aspect of care (Atkinson et al, 1977).

Elderly patients in the community

In the community, Kiernan and Isaacs (1980) found a lack of coordination of responsibility in the management of patients' medicines leading to inappropriate drug use, posing a potential risk to patients. They suggest that general practice pharmacists are well placed in the community to undertake the role of providing advice to patients, since the pharmacy is where patients have their prescriptions dis-

pensed and where they purchase most of their OTC preparations.

A practical contribution may be achieved by encouraging elderly patients to register with a pharmacy. The pharmacist would keep a record of all medication obtained, whether on prescription or purchased over the counter (Shulman and Shulman, 1980). Such records would help the rationalisation of medication and would allow for a more comprehensive communication between general practitioners and pharmacists in total drug care of the patient (Kiernan and Isaacs, 1980).

Elderly patients in residential homes

Recent studies of prescribing to the elderly in residential homes in the United Kingdom have produced cause for concern. Clarke et al (1981) found that 74 per cent of residents take prescribed medicines, and Bowling (1982) found that 26 per cent were taking four or more drugs daily. Morgan and Gilleard (1981) observed the lack of awareness of potential adverse drug reactions (particularly from hypnotics) by prescribing doctors, and Masterton (1981) pointed out the confusion and difficulty produced when many general practitioners attend one residential home. Morgan and Gilleard (1981) found that residents are prescribed more hypnotics than elderly patients living in their own homes and Bowling (1982) found that 42 per cent of residents are taking psychotropic drugs compared with 20 per cent of the non-institutionalised population over the age of 65 years.

In addition it is pointed out that the people in charge of residential homes have no training in the handling of medicines (Knox and Melvin, 1980; Pharmaceutical Society, 1981).

The Scottish Health Service Planning Council (1981) recommends that pharmacists should visit patients in long-stay units and residential homes regularly to review prescribing patterns of the medical staff, that medicines for patients should be supplied on an individual basis and that pharmacists serving residential homes must have regular access to inspect the arrangement governing the handling, storage and security of drugs and should be encouraged to develop systems for accurate drug dispensing in nursing homes.

The Pharmaceutical Society of Great Britain has also made pro-

posals for the control of medicines within residential homes (Residential homes, 1982).

In the USA, in 1974, standards were published for the certification and participation of skilled nursing facilities (nursing homes) in their Medicare and Medicard programmes, under which a pharmacist is responsible to the administrative staff for developing, coordinating and supervising all pharmaceutical services. The regulations specify that the pharmacist should review the drug regimen of each patient at least monthly and establish a method for communicating any irregularity to the administrator (Weinberger, 1974). However a review of studies of consulting pharmacists shows great variability in the way they carry out these duties (Garnett et al, 1981) and problems appear to arise with reimbursements and pharmacy discounts (Kidder, 1978). However, two studies have shown that physicians implemented 76 per cent of the recommendations made by pharmacists (Taylor and Martell, 1980; Garnett et al, 1981) and these results demonstrate that they can make a significant contribution to the quality of resident care.

In order to provide rational drug use in the elderly a project is underway at the University of Maryland School of Pharmacy to develop, implement and evaluate educational methods aimed at optimising the use of drugs by patients in nursing homes. It involves a continuous review of drug prescribing and use in a number of local nursing homes, coordinated with appropriate educational programmes specifically developed for physicians, nurses and patients (Palumbo, 1980).

Educating the elderly in the use of drugs

The value of educational therapy is becoming increasingly recognised (Hathcock, 1969). The aims are to create a pleasant and educational environment for long-stay patients in hospital and to become an ancillary phase of overall treatment, both in primary and secondary care. Given the many problems which old people face with their medications, as outlined in previous chapters, it would seem logical to include more structured education in their correct use as an integral part of such programmes.

Objectives and costs

The objectives of educating patients in the use of drugs are variously defined, with the emphasis firmly on promoting compliance with regimens and consequently reducing medication errors, which may often be more serious in the elderly than in younger patients (Weibert, 1974).

Compliance lies with the patient, therefore providing him with an understanding of his illness, proper information and specific compliance aids may contribute to the solution of the non-compliance problem (Rehder et al, 1980).

Other objectives include the maintenance and/or improvement of health (Tosteson, 1975), improved capabilities in coping with disease (Swezey and Swezey, 1976), a reduction in the use of hospital beds and of medications in general (Rosenberg, 1976), greater safety in the use of drugs (Knapp, 1974) and an increased awareness of the early symptoms of drug toxicity (Weibert, 1974). In addition, the current legal climate regarding informed consent makes it wise for health-care professionals to instruct patients about the potential hazards of their drug therapy (Tozer and Kasik, 1967) and these same professionals should derive more fulfilment through patient drug education (Weibert, 1974) and through the improved professional relationships which develop (Kabat, 1969).

The costs of mounting such programmes are inevitably very high, and cost-effective methods of patient education in both hospital and community settings are in need of study (Rosenberg, 1976; Neufeld, 1976). Substantial cost reductions have been reported in those instances in which the economic implications of patient education or self-care have been evaluated (Rosenberg, 1976), particularly in the lower cost of therapy itself (Tosteson, 1975).

Lundin et al (1980) in their pilot study of methods of educating the independent elderly in the responsible use of prescription medication found some evidence that the elderly frequently made attempts to educate themselves through the purchase and use of printed resources. It has also been shown that elderly people who have received higher education tend not to comply with their drug regimen. This may be because they are exercising more independence in decision-making about their medicines so it is time they were given clearer information upon which to make better choices (Raffoul, 1981).

Learning ability in the elderly

Since the health professions are expected to utilise the best available approaches and to be guided by recognition of sound educational principles, methodologies and techniques when planning patient education curricula, it is obviously relevant to examine what is known about the factors involved in learning and the elderly.

The popular stereotype of old age is confusion and loss of memory, but studies show that the elderly can learn new skills and ideas. A great deal of disengagement of elderly people from social and intellectual activities is due to their acceptance of the popular idea that old age and incompetence go hand in hand. In fact, there is growing data to suggest that intelligence does not decline because of the ageing process, but that only certain intellectual abilities are age-related, whilst others are either age-resistant or influenced by environmental stimuli, education and experience (Atkinson, 1977; Woodruff and Walsh, 1975).

Methods of assessing intellectual functioning in the aged are described (Savage and Hall, 1973), but the point is also made that performance and ability to learn in old age seems to depend not only

on physical and mental capacities, but upon willingness to use these capacities fully (Welford, 1976). Other aspects of personality, attitudes, motivation, life-style and satisfaction are discussed (Apt et al, 1972; Adams, 1971) along with non-cognitive factors that have been found to impair the learning performances of the old, such as extra time requirements, stressful evaluation techniques and the meaningfulness of the material to be learned (Woodruff and Walsh, 1975). The relative merits of paced and self-paced learning have been evaluated (Canestrari, 1963).

Communicating with elderly people and instruction in drug use

The effectiveness of communication between health-care professionals and patients must be judged by three interrelated criteria: satisfaction, compliance and therapeutic outcome. Both satisfaction and compliance are seen to improve with increased interaction between physicians and patients and with increased educational efforts by health-care professionals in general (Isler, 1977; Temkin et al, 1975; Vertinsky et al, 1974).

A study designed to establish any relationship between personality traits and information sources used by aged consumers, and between formal and informal sources (Klippel and Sweeney, 1974) found that the utilisation of informal information sources (and by that the authors mean information provided by people as opposed to that provided by formal sources such as newspapers, advertisements and so on) in communicating with the aged can be a useful strategy. On the other hand, both written and oral communications should reinforce each other and should not be considered as substitutes for each other (Doggett, 1979). Audiovisual aids in the drug education field are described (Welk et al, 1974), and it is thought that more imaginative use of these would perhaps combine both approaches (Holloway, 1974; Schwartz et al, 1962). Audiovisual aids are frequently advocated for their persuasive value (Morris et al, 1975). Stewart and Cluff (1972) consider that audiovisual techniques could enable much of the teaching to be accomplished without consuming the time of health professionals. However, Plant (1977) and Thorson and Thorson (1979) argue that the teaching function should not be delegated

to a teaching machine or film loop projector nor delegated to someone who does not have the understanding of the effects and possible adverse effects of medication.

A good television programme for the elderly, which includes advice on medicine taking, is suggested (Wade, 1972) and making more use of the media (Plant, 1977) is recommended.

Oral communication or instruction, with its inherent face-to-face encounter, involves the active participation of both parties and encourages patients to ask questions (Korcok, 1976). Occasionally counselling alone is seen to be virtually as effective in improving compliance as a combination of oral and written communication (Macdonald et al, 1977). However, the more usual results indicate that oral instruction alone is inadequate (Davidson, 1974; Wandless and Davie, 1977; Wandless and Whitmore, 1981).

There are many obstacles to effective communication. Research on the problems of communicating with patients has revealed two kinds of communication, the informative and the persuasive, and has attempted to identify the social and psychological variables and procedures which may affect attitude change (Ley, 1975). Attempts to increase comprehension and memory have resulted in increased satisfaction and compliance, but it is recognised that these are not sufficient in themselves alone. Factors contributing to lack of understanding and forgetting are outlined and discussed and some solutions proposed (Ley, 1975). These include the use of short words and sentences, clustering information, repetition and the use of specific rather than general advice. With elderly patients it may also be advisable to speak slowly, clearly and loudly if necessary (Korcok, 1978) and to ensure that any instructions are issued with the drugs themselves, not merely with the prescription (Schwartz, 1975).

Written instructions are considered to be the least expensive and most convenient educational aids, which have many advantages such as the ability to be retained for future reference, accuracy and standardisation and completeness of information (Weibert, 1974). Written instructions may either serve as a starting-point for further education and a stimulus for questions (Weibert, 1974), with counselling as an essential back-up, or as a much-needed visual reminder (Schwartz, 1965) or memory aid (Korcok, 1978), the effectiveness of

which, however, needs further evaluation (Keet, 1976).

Types of written communications range from advertisements, which may be seen as a substitute for the enormous exchange of information between sellers and buyers which would otherwise have to take place (Rheinstein and Mazis, 1976) through prescriptions, labels and package inserts (Doggett, 1979), to some of the more sophisticated memory aids which have been tested in various studies. These include handouts giving a checklist of general medication dos and don'ts (Plant, 1977), medication profiles designed to detect potential problems (Solomon et al, 1974), daily diaries of clearly written instructions (Freeman, 1974), written personal drug cards (Atkinson et al, 1978), and tear-off calendar cards, which appear not to be acceptable to all patients and are very laborious to produce even though they do seem to produce modest reductions in the number of errors made (Davidson, 1974; Macdonald et al, 1977; Wandless and Davie, 1977). Tablet-identification cards have been less successful in promoting compliance (Macdonald et al, 1977; Wandless and Davie, 1977) and one study involving a pill wheel actually increased errors (Macdonald et al, 1977). In another study utilising the following teaching methods – oral instructions, oral and written, and oral, written and memory aids – there was no significant difference in compliance among the groups (Lundin et al, 1980). Nevertheless it is generally accepted that oral instructions should be reinforced with written instructions.

The important subject of the content of drug education communications for the elderly has not been overlooked. It has been recommended that a positive pharmaceutical input is needed in the preparation of more health education material directed at the elderly on the topics of the correct use of prescribed medicine and self-medication (Lamy and Kitler, 1971; Plant, 1977; Scottish Health Service Planning Council, 1981), action and adverse effects of medicines (Isler, 1977; Korcok, 1978) and on the safe disposal of old and unused drugs (Atkinson et al, 1978; Law and Chalmers, 1976; Parkin et al, 1976; Scottish Health Service Planning Council, 1981).

Value is placed on the setting in which drug education takes place, (Keet, 1976) and although the necessary programmes are perhaps more easily devised and carried out in a hospital environment, the importance of effective education in the community must not be

overlooked (Neufeld, 1976; Rosenberg, 1976). Sometimes it is important to ensure privacy so that the patient will not be embarrassed and will feel encouraged to listen and to ask questions (Weibert, 1974). At other times group talks given in places where the elderly congregate within the senior-citizen network can be just as effective, provided that time is allowed for individual counselling if required (Plant, 1977).

Perhaps the basis for effective education lies in the body of knowledge provided from a number of disciplines as diverse as communications theory, sociology, educational and social psychology, adult education, public health and clinical medicine. If this is so, then a process of merging these various perspectives is needed, so that the advantages of each can be brought into a coherent attack on the problem, involving collaboration between statisticians, educators, health-care professionals, patients and their families, and particularly between health-care professionals themselves (Neufeld, 1976; Rosenberg, 1976). Where this multidisciplinary approach has been tried it has proved to be effective (Kelly, 1972), although there is one warning of the need to be aware of any unethical 'mind-bending' which may be inherent in the approach itself (Keet, 1976). It is recognised that health-care professionals may feel their various roles threatened to some extent by sharing their knowledge with others (Redman, 1974), but more active concern for the welfare of the patient should always be the overriding consideration (Whitney, 1975).

During the last two years the University of Maryland has developed and implemented an innovative approach to both undergraduate pharmacy education and consumer drug education called Elder-Ed. The overall goal of the project is to educate older persons about their medications by using a trained team of pharmacy students and retired pharmacists.

The team is given a series of lectures on drug use in the elderly. Smaller groups then prepare presentations on pertinent topics and deliver them to groups of elderly where they gather – senior citizen centres and so on.

Currently the effectiveness of the programme is being evaluated and additional material is being prepared. In the final year a comprehensive teaching manual with accompanying teaching aids will be pro-

duced for distribution to other interested persons (Beardsley et al, 1981; Feinberg, 1980).

Another American programme is attempting to discover how much drug use is intentional, and how much unintentional, as well as to foster the role of the pharmacist in the development of informed drug use by the elderly (Plant, 1977). It should perhaps be noted that this group is one of the few who have made efforts to include health and drug education talks as part of company pre-retirement programmes, thus taking them out of the 'medical' sphere altogether, but they report very little success.

Conclusions

The majority of comments, findings and recommendations reported in this review on the use of drugs in the elderly apply to the use of drugs in general. They highlight deficiencies and spell out objectives for the future if the use of drugs is to become optimal. These objectives should be:

To understand more about patient behaviour.

To improve the basic and continuing education and training of physicians, pharmacists, nurses and other health care professionals.

To improve communications between health-care professionals and patients and between health-care professionals.

To improve patient education.

To educate patients in self-care including self-medication.

To recognise environmental, social, psychological and other aspects of disease and to develop an holistic approach to the treatment of patients.

To understand more about the drugs used and how the body deals with them in various physiological and pathophysiological states.

To develop effective and efficient information services to health care professionals.

To understand factors which influence the prescribing and use of drugs.

To develop effective methods of monitoring adverse drug reactions and to determine benefits to risks of drug treatment.

Elderly patients require professional competence, sympathy, understanding and the optimal use of any intervention whether social or

medical; above all they need caring about and caring for. If, in addition, the above objectives were met then we could look forward to improved quality of health care and there would be little need to separate care of elderly patients from the main stream of health care.

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