



FIG 3—Though not so consistently successful as container 11, these four containers were judged more successful than the others.

turns (long thread) performed poorly in this study. The most successful containers had tall bases and angulated tops. The top should not be the same size as the base (preferably slightly smaller) and the base should fit comfortably in the hand. Glass is not liked by patients.

The best container was about 8 cm high with a lightweight base that had sides that were both flat and rounded (fig 2). The screw top should be deep and angulated or ridged with a very short thread.

It was interesting that one particular container proved outstanding in so many (but not all) respects. Though this was the only one of the 12 tested with an orange top we think it unlikely that the colour caused its success; colour has, however, been recorded as a reason for patients preferring tablets, red performing better than white.¹ Of the four other containers that

were more successful than the others two had wing tops; these appear to be a successful feature for some patients, though we admit to slight anxiety that the sharp edges may produce local injury in patients with fragile skin.

Two of the containers tested (No 4 and 9) were of experimental design and were not then commercially available. Container 4 has now been subjected to further modification and this version, claimed to have an improved performance, is now commercially available. Nevertheless, we urge those manufacturers whose products performed badly in this study to at least consider re-designing their containers in a similar style to one of those that performed better. It must also be understood that "childproof" is "arthritic proof" and society must distinguish between ensuring easy access to medicines for those needing them and parental responsibility in ensuring that this does not mean easy access for young children.

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References

- ¹ Wright V, Hopkins R. Administration of anti-rheumatic drugs. *Ann Rheum Dis* 1976;**35**:174-6.
- ² Mason DIR, Brooks PM, Maurikakis ME. Study of opening medicine bottles in patients with rheumatoid arthritis. *Journal of Clinical and Hospital Pharmacy* 1976;**1**:171-5.
- ³ Lambert J, Hopkins R, Wright V, Cardoe N. Child restraint containers: an appraisal in arthritic patients. *Rheumatol Rehabil* 1978;**17**:89-91.

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Medical and social factors influencing admission to residential care

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Abstract

The increasing number of people aged over 75 in Britain makes heavy demands on health and social services. To obtain accurate information for rational allocation of resources to domiciliary and residential services a group of 98 housebound women over 75 were compared with a group of 99 women of the same age in residential care. They had a similar range of physical disorders with the exception that deafness was more common among women in residential care. A much higher proportion in residential care were demented. Though in many respects women in residential care had less physical incapacity, a

higher proportion needed help at times of crisis. Important social factors were that women at home were more likely to be living with others, and that the principal helper was more likely to be a husband or relative than a neighbour. Both groups received the same amount of support from home helps and community nurses.

Any reduction in the number of residential care places for elderly women whose relatives are not available or are unable to cope would require the establishment of an effective community psychogeriatric service and a system for providing appropriate subjects with 24 hour care and supervision.

Introduction

In Great Britain the number of people over 75 continues to rise, and as many suffer from mental or physical incapacity they make heavy demands on health and social services.^{1 2} One form of support is residential care, but this is expensive and exposes clients to the disadvantages of institutionalisation.³ An alternative is to use domiciliary services to maintain old people in their own homes. Such services, however, are also expensive, and while appropriate for people requiring periodic intervention, are less effective in those requiring constant attendance.^{4 5}

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Rational allocation of resources to domiciliary and residential services requires accurate information on clients whose physical and social disabilities place them close to the boundary between these two forms of care.⁶ We investigated such a population by comparing a group of elderly women living at home with a group of elderly women recently admitted to residential care.

Subjects and methods

Doctors from four group practices in Dundee provided the names of women over the age of 75 who were housebound. Each month, Tayside social work department brought up to date a list of all women over 75 recently admitted to residential care in Dundee.

A community nurse visited all potential subjects to seek their consent to participation and used a proforma to collect details on their social background. On a subsequent visit a doctor took a structured history, which included information on mobility and the ability of the woman to take care of herself, and performed a physical examination, which included an assessment of visual acuity, skinfold thickness,⁷ and sway.⁸ Two simple questionnaires were used to quantify mental status and depressive symptoms.^{9,10}

The information was used to classify the frequency with which subjects required help as follows⁵:

At long intervals—Subject needs help every 24 hours or longer—namely, she walks with aid or without help or aid and can use the toilet without help, but she cannot shop without help, cannot make a bed or clean rooms, and washes and dresses with difficulty on her own.

At short intervals—Subject needs help every three to six hours—namely, she can use the toilet without help but cannot prepare simple meals or hot dishes and cannot make her bed, clean rooms, or wash clothes.

At times of crisis—Subject needs help as soon as problem arises—namely, she cannot transfer from bed to chair, needs help with using the toilet or is incontinent of urine or faeces, or has severe chronic mental impairment.

An attempt was also made to identify a "principal" helper for each subject.¹¹ He or she was defined as being the person, other than a home help, who provided more help than anyone else.

TABLE I—Physical and mental state of and help needed by 98 women living at home and 99 women in residential care

	Home	Residential care
Symptoms and signs:		
Breathless on dressing	18	5
History of falls	41	21
Moderate or severe deafness*	22	39
Mental state (questionnaire score) ⁹ †:		
0-3	8	27
4-6	10	21
7-10	79	50
Help needed:		
At long intervals	54	50
At short intervals	34	23
At times of crisis	10	26

* Moderate deafness = cannot hear normal voice; severe deafness = cannot hear raised voice.

† Data lacking in two subjects.

Results

CLINICAL CONDITION

Ninety eight women aged 75 to 101 at home and 99 aged 57 to 97 in residential care were studied. The most common diagnoses were congestive cardiac failure, chronic obstructive airways disease, osteoarthritis, Parkinson's disease, and old strokes, but the prevalences were similar in the two groups. Means and standard errors for numbers of physical diagnoses in the two groups were 3.51 (0.19) in the housebound women and 3.69 (0.29) in those in residential care.

Breathlessness was more common in women at home ($\chi^2=7.227$, $0.01 > p > 0.001$) as was a history of falls ($\chi^2=9.71$, $0.01 > p > 0.001$), while deafness was more common in those in residential care (χ^2 (Yates's correction) = 6.615, $p.05 > p > 0.01$ (table I). Means and standard errors for triceps skinfold thickness were 17.9 (0.78) mm for women at home and 14.8 (0.56) mm for those in residential care ($t=3.35$, $p < 0.001$). Geometric means and 95% confidence limits for

sway were 29 (27-31) units for women at home and 38 (34-42) units for those in residential care ($t=3.46$, $p > 0.001$). Prevalences for angina, intermittent claudication, systolic and diastolic hypertension, abnormal plantar reflexes, and visual impairment were similar in the two groups.

PSYCHIATRIC CONDITION

The prevalence of women with a low mental test score was much greater in those admitted to residential care (table I) ($\chi^2=19.8$, 3 df, $p < 0.001$). A score of 0-3 signifies gross dementia, a score of 4-6 moderate dementia, and 7-10 not demented. High ratings for depression were found in 11 women at home and in two in residential care (χ^2 (Yates's correction) = 5.30, $0.05 > p > 0.01$).

CAPACITY FOR TAKING CARE OF SELF

Fifty one women at home compared with 34 in residential care walked without help or aid ($\chi^2=6.29$, $0.05 > p > 0.01$). Few in either group were permanently in bed or in a chair or required help with walking. Fourteen women at home needed help with dressing; none in residential care needed such help. All five women who were unable to wash themselves were at home. Thirty four women in residential care compared with 59 at home, however, required help with bathing ($\chi^2=12.25$, $p < 0.001$). A much greater proportion of women in residential care needed help at times of crisis (table I) ($\chi^2=8.50$, $0.01 > p > 0.001$).

SOCIAL BACKGROUND

Eighty six women at home and 95 in residential care were single, widowed, or divorced (χ^2 (Yates's correction) = 3.41, not significant). Sixty three of those at home and 56 in residential care had living children, while 62 of those at home and 50 of those in residential care had living siblings.

Twenty five women living at home compared with 14 in residential care were in receipt of a private income or pension ($\chi^2=3.96$, $0.05 > p > 0.01$). Thirty four women at home compared with 16 in residential care were home owners or the wives of owners ($\chi^2=8.50$, $0.01 > p > 0.001$), while 14 of those at home and 35 of those in residential care had been tenants or the wives of tenants ($\chi^2=8.77$, $0.01 > p > 0.001$).

Thirty one women at home but only 17 of those in residential care had lived with others ($\chi^2=5.58$, $0.05 > p > 0.01$). Of women with living children, 46 of those at home and five in residential care had children living within one mile of them ($\chi^2=10.70$, $0.01 > p > 0.001$).

PRINCIPAL HELPERS

None of the women in residential care had had husbands who had been principal helpers, and only one woman at home identified a friend or neighbour as being a principal helper (table II). Thirty three of the 70 principal helpers to women at home lived in the same house compared with only 18 of the 67 helpers to women in residential care ($\chi^2=6.02$, $0.05 > p > 0.01$). Of helpers living outside the home, 21 of 37 to women at home and 22 of 49 to those in residential care lived within a mile of the house. There was no difference in the amount of help given with personal care and housework by principal helpers to the two groups.

STATUTORY SERVICES

Many women from each group were supported by either home helps or community nurses (table III). A larger proportion of women admitted to the residential home had been attending a local authority day centre ($\chi^2=2.16$, not significant) or a day hospital ($\chi^2=7.87$, $0.01 > p > 0.001$).

Discussion

The control group was limited to women who were housebound because it is from this margin of incapacity that women are most likely to require admission to residential care.⁶ Inclu-

sion of all women at home would have produced a sample of women in whom only a small minority were potential candidates for residential care. Factors other than physical incapacity would not then have been highlighted.

The bias of the sample accounts for the higher prevalence of many symptoms and signs in the group living at home, so that the excess of deafness among women in residential care is particularly striking. It is not clear why problems of communication should lead to a loss of independence, but further study might show whether more medical and social support for deaf people would reduce their need for residential care. The reduced skinfold thickness and higher degree of sway in the group in residential care can be interpreted in a variety of ways. One possibility is that these symptoms or signs relate to subnutrition and ataxia associated with a high prevalence of dementia.

TABLE II—Relationship of principal helper to women at home and in residential care

Principal helper	Home	Residential care
No	24	28
Husband	6	0
Child	41	38
Sibling	10	11
Other relative	12	8
Friend or neighbour	1	10

Data lacking in eight subjects.

TABLE III—Help provided by statutory services to women at home and in residential care

	Home	Residential care
Home help	51	55
Community nurse (at least once a week)	23	27
Day centre	3	9
Day hospital	5	19

Analysis of mobility among the women and of their ability to take care of themselves emphasises the bias in the selection of the sample living at home, as women with more than a certain degree of disability are unacceptable for residential care. It is particularly striking, therefore, that when needs at times of crisis were analysed there was a conspicuous preponderance of these needs in the group living at home. The paradox probably results from the much higher prevalence of dementia in the group in residential care. Many of the needs of patients with physical disability can be met by help provided at intervals of hours or even days. A demented patient, however, may have relatively few physical needs but require almost continuous supervision.

The social background of women affected their place of residence in a variety of ways. Thus a greater proportion of women with a private pension or income remained at home, and it could be that extra financial resources were useful in achieving this. Again, though the general standard of housing seen was high, women from owner occupied property were less often in residential care, while those from privately rented accommodation were more likely to be there. This could reflect the high standard of privately owned housing and inadequacy of privately rented accommodation.

The proximity of support also seems important. Ideally, helpers should be in the same house, but those living close by may also be effective. Proximity is particularly critical where elderly people require several visits a day, and where a prompt reaction to a crisis is required.

The relationship of the helper is important. Women supported by a mentally and physically fit elderly husband rarely required

residential care. In comparison, neighbours seemed much less effective than relatives in general. The situation might be different if neighbours were given specific duties and a payment were made for these.

There was no evidence that lack of support with personal care or housework led to admission to residential care. Most women at home and in residential care received a high level of support from relatives, from the home help and community nursing services. The main difference between them was that fewer of those in residential care had had access to help at times of crisis.

If mental impairment and lack of support 24 hours a day frequently led to admission to residential care, how can this need be met? A partial solution is to have a psychogeriatric care effectively orientated towards community support.^{12 13} Aspects of this include support and follow up from community psychiatric nurses, active psychogeriatric day hospitals, and a rapid response to a crisis by admission to hospital for a short time.

Home helps, meals on wheels, and day centres maintain many people at home, but inevitably fail to cope with those requiring constant supervision. The task also is beyond the remit of the warden of sheltered housing. One approach might be to use neighbours, but training, financial support, and a high degree of motivation would be required. Attention also might be given to increasing the level of staffing in selected complexes of sheltered housing, backing this up with close liaison and support from health and social work agencies.¹⁴ A pilot study in Southampton has produced promising results and might usefully be replicated in other parts of the country.

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References

- Carstairs V. Our elders. In: Shegog RFA, ed. *The impending crisis of old age*. Oxford: Oxford University Press, 1981:29-42.
- Harris AI. *Handicapped and impaired in Great Britain*. London: HMSO, 1971.
- Goffman E. *Asylums*. Harmondsworth: Pelican, 1961.
- Opit LJ. Domiciliary care for the elderly sick—economy or neglect? *Br Med J* 1977; **i**:30-3.
- Isaacs B, Neville Y. The needs of old people. *Br J Prev Soc Med* 1976; **30**: 79-85.
- Mooney GH. Planning the balance of care for the elderly. *Scottish Journal of Political Economy* 1978; **25**:149-64.
- Dunin JVGA, Womersley J. Body fat assessment from total body density and its estimation from skinfold thickness: measurements on 481 men and women aged from 16 to 22 years. *Br J Nutr* 1974; **32**:77-97.
- MacLennan WJ, Timothy JJ, Hall MRP. Vibration sense, proprioception and ankle reflexes in old age. *Journal of Clinical and Experimental Gerontology* 1980; **2**:159-72.
- Wilson LA, Brass W. Brief assessment of the mental state in geriatric domiciliary practice: the usefulness of the mental status questionnaire. *Age Ageing* 1973; **2**:92-101.
- Copeland JRM, Kellehan MJ, Kellett JM, et al. A semi-structured clinical interview for the assessment of diagnosis and mental state in the elderly: the geriatric mental state schedule. 1. Development and reliability. *Psychol Med* 1976; **6**:439-49.
- MacLennan WJ. *Young chronic sick at home and in hospital*. Glasgow: University of Glasgow, 1973. Thesis.
- Arie T, Isaacs AD. The development of psychiatric services for the elderly in Britain. In: Isaacs AD, Post F, eds. *Studies in geriatric psychiatry*. Chichester: John Wiley and Sons, 1978:241-62.
- Godber C. The elderly patient with dementia. In: MacArthur M, Millard P, eds. *Management of chronic illness*. London: King Edward's Hospital Fund for London, 1978:11-20.
- Brown D. *Kinloss Court sheltered housing scheme*. Winchester: Research Section Hampshire County Council Social Services Department, 1981.

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