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**Ethical approval:** Not required.

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## Randomised controlled trial of an occupational therapy intervention to increase outdoor mobility after stroke

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### Abstract

**Objective** To evaluate an occupational therapy intervention to improve outdoor mobility after stroke.

**Design** Randomised controlled trial.

**Setting** General practice registers, social services departments, a primary care rehabilitation service, and a geriatric day hospital.

**Participants** 168 community dwelling people with a clinical diagnosis of stroke in previous 36 months: 86 were allocated to the intervention group and 82 to the control group.

**Interventions** Leaflets describing local transport services for disabled people (control group) and leaflets with assessment and up to seven intervention sessions by an occupational therapist (intervention group).

**Main outcome measures** Responses to postal questionnaires at four and 10 months: primary outcome measure was response to whether participant got out of the house as much as he or she would like, and secondary outcome measures were response to how many journeys outdoors had been made in the past month and scores on the Nottingham extended activities of daily living scale, Nottingham leisure questionnaire, and general health questionnaire.

**Results** Participants in the treatment group were more likely to get out of the house as often as they wanted at both four months (relative risk 1.72, 95% confidence interval 1.25 to 2.37) and 10 months (1.74, 1.24 to 2.44). The treatment group reported more journeys outdoors in the month before assessment at both four months (median 37 in intervention group,

14 in control group;  $P < 0.01$ ) and 10 months (median 42 in intervention group, 14 in control group;  $P < 0.01$ ). At four months the mobility scores on the Nottingham extended activities of daily living scale were significantly higher in the intervention group, but there were no significant differences in the other secondary outcomes. No significant differences were observed in these measures at 10 months.

**Conclusion** A targeted occupational therapy intervention at home increases outdoor mobility in people after stroke.

### Introduction

Many people after stroke do not get out of the house as much as they would like, and this has deleterious effects on quality of life.<sup>1,2</sup> Some reasons for poor outdoor mobility are potentially remediable, including lack of confidence and inadequate information on transport options, aids, appliances, or adaptations to the home.<sup>3</sup> On the basis of findings of a qualitative interview study, we developed an occupational therapy intervention programme to overcome these barriers.<sup>3</sup>

### Methods

We identified patients with a clinical diagnosis of stroke in the previous 36 months from general practice registers and other sources in the community. We included people in care homes.



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A research occupational therapist (PAL) collected baseline data, which included personal details, mobility status, personal activities of daily living ability (Barthel activities of daily living index),<sup>4</sup> instrumental activities of daily living ability (Nottingham extended activities of daily living),<sup>5</sup> and psychological wellbeing (12 item version of the general health questionnaire).<sup>6</sup> At this visit PAL provided one session of occupational therapy. This included advice, encouragement, and the provision of leaflets describing local mobility services. This session reflected a routine occupational therapy session and also served as the intervention for those who were later allocated to the control group.

Participants were then randomly allocated to either the control intervention or the outdoor mobility intervention.

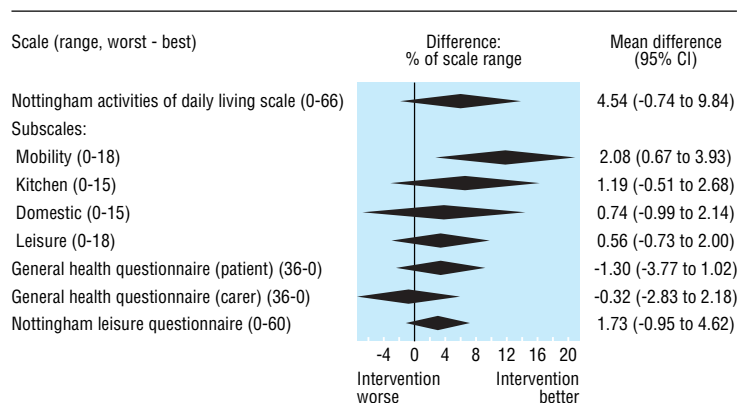
PAL made a clinical assessment of the barriers to outdoor mobility in the participants allocated to the occupational therapy intervention, negotiated mobility goals with them, and then delivered interventions to achieve those goals, using up to seven treatment sessions at home for up to three months. The treatment programme included the provision of information (for example, resuming driving, alternatives to cars and buses); the use of minor aids or adaptations, such as walking aids; and overcoming fear and apprehension by, for example, accompanying participants until confidence was restored. Aids and appliances were obtained from usual sources.

### Outcome measures

We measured outcomes by post at four and 10 months after randomisation. Our main outcome measure was the response to the query "do you get out of the house as much as you would like?" Our secondary measures were response to the query "how many journeys outdoors have you taken in the last month?" and scores on the Nottingham extended activities of daily living scale,<sup>5</sup> Nottingham leisure questionnaire,<sup>7</sup> and the 12 item version of the general health questionnaire.<sup>6</sup> Partners or carers were also invited to complete the general health questionnaire.

## Results

Between June 2001 and December 2002, we invited 262 people to take part in our study (see [bmj.com](http://bmj.com)). Overall, 178 of the 262 people responded of whom 10 were excluded, leaving 168 participants. The groups were comparable at baseline (table 1).



Multivariate linear regression analysis of self reported mobility scores at four months, adjusted for sex, ethnic origin, age, and prior use of transport at baseline. Centre of diamonds represents estimated treatment effect when expressed as percentage of scale range for each scale, and ends of diamonds are 95% confidence intervals for effects

**Table 1** Baseline characteristics of people with clinical diagnosis of stroke allocated to outdoor mobility intervention or leaflet describing local transport services for disabled people (control group). Values are numbers (percentages) of participants unless stated otherwise

Characteristic	Intervention group (n=86)	Control group (n=82)
Mean (SD) age (years)	74 (8.4)	74 (8.6)
Men	40 (46)	51 (62)
Residential status:		
Lives alone	36 (42)	31 (39)
Lives with others	46 (54)	47 (57)
Lives in care home	4 (5)	4 (5)
Mean (SD) time (months) from stroke	11 (8.4)	10 (9.0)
Self reported mobility:		
Housebound	32 (37)	30 (37)
Is accompanied when travelling	25 (29)	20 (24)
Travels alone	29 (34)	32 (39)
Gets out of house as much as wants	24 (28)	32 (39)
Median (interquartile range) scores:		
Barthel activities of daily living index	18 (16-20)	17 (13-20)
Nottingham activities of daily living	23 (12-31)	21 (9-35)
General health questionnaire	10 (7-13)	11 (8-13)

### Intervention and outcomes

Participants in the intervention group had a mean number of 4.7 visits (median 6, interquartile range 4-6), giving a mean (SD) total of contact time of 230 (113) minutes.

At both four and 10 months, participants in the intervention group were more likely to get out of the

**Table 2** Outcomes at four and 10 months for people receiving outdoor mobility intervention or leaflets describing local transport services for disabled people. Values are medians (interquartile ranges) unless stated otherwise

Outcomes	Intervention group (n=86)	Control group (n=82)	Relative risk (95% CI)	P value (Mann-Whitney U test)
Four months:				
No (%) who got out of house as much as wanted	56 (65)	30 (35)	1.72 (1.25 to 2.37)*; number needed to treat 3.3	—
Outdoor journeys in past month	37 (18-62)	14 (5-34)	—	P<0.01*
10 months:				
No (%) who got out of house as much as wanted	53 (62)	33 (38)	1.74 (1.24 to 2.44)†; number needed to treat 4.0	—
Outdoor journeys in past month	42 (13-69)	14 (7-32)	—	P<0.01†

Number needed to treat is number of participants needed to be treated to produce one additional person who could get out of house as much as he or she wanted.

\*Responders only (n=158): relative risk 1.64 (1.20 to 2.25); intervention, median 39, control, median 15.

†Responders only (n=147): relative risk 1.67 (1.21 to 2.31); intervention, median 46, control, median 15.

house as often as wanted and to undertake more journeys in the month before assessment (table 2).

At four months, mobility scores on the Nottingham extended activities of daily living scale were significantly higher in the intervention group than in the control group, but the differences in the scores on the total and other subscores of the Nottingham extended activities of daily living scale, Nottingham leisure questionnaire, and general health questionnaire did not reach significance (figure). By 10 months we found no significant differences in the scores (see [bmj.com](http://bmj.com)).

## Discussion

A simple and feasible occupational therapy intervention in people after stroke was successful in increasing outdoor mobility in both the short and the longer term. The benefits of treatment were not lost within the observational period.

This targeted intervention was specially prepared for this study and was expected to overcome many of the barriers to outdoor mobility in patients after stroke. We propose that a cause and effect relation exists between our intervention and the improvement in outcome, and also that our findings are clinically meaningful.

Our recruitment rate indicates that there is likely to be a sufficient number of people in other health districts to make it worth while setting up services to deliver the intervention elsewhere. The high adherence to the trial protocol and the relatively small number of visits for occupational therapy suggests that the intervention is feasible within a NHS or similar healthcare setting (for example, community rehabilitation teams).

Our findings are likely to apply to the delivery of the intervention by other motivated occupational therapists who have been trained to provide the sorts of interventions used in this study. Our findings may not, however, apply to services delivered by untrained staff, to treatments that are considerably shorter than in our study, or to where one or more elements of the intervention cannot be provided, such as access to aids and equipment.

Our findings that occupational therapy can improve outdoor mobility are novel, but they are compatible with existing evidence that supports the use of community rehabilitation services after stroke<sup>8</sup> and targeted interventions from an occupational therapist.<sup>9</sup>

### What is already known on this topic

The quality of life of many people after stroke is poor because they are housebound

### What this study adds

A brief intervention by an occupational therapist improves outdoor mobility in community dwelling people after stroke

The intervention includes the provision of information, aids, and appliances, and approaches to overcoming fear

The intervention is likely to be feasible in many healthcare settings

We thank the participants, the primary care services who searched their records for people with stroke and sent letters on our behalf, Carol Coupland (lecturer in statistics) who provided statistical assistance, and Trent Focus, Primary Care Research network for promoting the research in the primary care setting.

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## The curse of the snake god

The 60 year old man presented with a six month history of curly, serpiginous, and tortuous lesions on the right side of his chest and a one month history of breathlessness on strenuous activity. He had been a smoker for the past 30 years.

A local indigenous practitioner cum priest had been managing him with local herbal application, special pooja (prayer), and other rituals and had told him that the snake-like lesions on the chest were due to the curse of the snake god. However, despite following the priest's advice religiously, the patient did not feel better and hence came to seek the aid of modern medicine.

The patient was well built and well nourished with distended veins on the right side of the chest. There was flushing and

oedema of the face, decreased breath sound, and dullness on percussion at the infraclavicular area. The chest x ray showed a large mass lesion at the apical region of the lung, and carcinoma of the lung with superior venacaval obstruction was diagnosed.

Although there have been tremendous advances in medicine over the past few decades, myths and blind beliefs continue to haunt our villagers. Our patient had been told that his problem was due to sins committed in his previous life, but I felt it was definitely due to sin committed in this life—that is, smoking.

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