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Intensification of the transition between inpatient neurological rehabilitation and home care of stroke patients. Controlled clinical trial with follow-up assessment six months after discharge

E Gräsel, J Biehler Clinic for Psychiatry and Psychotherapy, University of Erlangen-Nuremberg, **R Schmidt** and **W Schupp** Fachklinik Herzogenaurach (Clinic for In- and Outpatient Rehabilitation Medicine), Herzogenaurach, Bavaria, Germany

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Objective: An intensified transition concept between neurological inpatient rehabilitation and home care was investigated for effects on the functional status of stroke patients and the physical and emotional health of their carers.

Design: Controlled clinical trial allocating patients to intervention group (intensified transition on ward II) or control group (standard transition on ward I); patients were allocated to whichever ward had a vacancy. Follow-up assessment was carried out six months after discharge.

Subjects: Seventy-one patients and their family carers were included, of which nine cases dropped out. Therefore 62 stroke patients with persisting disability and their family carers were available for assessment at follow-up – 33 patients in the intervention group, 29 patients in the control group.

Intervention: The intensified transition concept consisted of therapeutic weekend care, bedside teaching and structured information for relatives during the second phase of the rehabilitation.

Main measures: Patients were assessed with the Barthel Index, Functional Independence Measure, Ashworth Spastic Scale, Frenchay Arm Test, and Timed Up and Go Test. The carers completed SF-36, and were assessed using the Giessen Symptom List, Depression Scale and Burden Scale for Family Caregivers.

Results: The intensified transition did not lead to significant change in the functional status of the patients or in the physical and emotional health of the family carers. Within the first four weeks after discharge, the patients in the intervention group had fewer new illnesses. In the observation period the use of outpatient care services was more frequent in the intervention group than in the control group.

Conclusion: Even though there are few differences of moderate intensity between the two groups the intensified transition programme does not affect either the functional status of the stroke patients or the health of the carers.

Address for correspondence: Wilfried Schupp, Fachklinik Herzogenaurach (Clinic for In- and Outpatient Rehabilitation Medicine), Department of Neurology, In der Reuth 1, D-91074 Herzogenaurach, Germany.
e-mail: sandra.schraml@fachklinik-herzogenaurach.de

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Introduction

Strokes represent one of the most common neurological diseases in Germany, with an incidence of 182 in 100 000 in the general population, a value similar to that in other western industrialized nations.¹ The mortality rate following a stroke is 19.4% within the first 28 days (1). Up to two-thirds of all patients surviving the acute event must reckon with long-term restrictions to their physical functions and in their activities of daily living (ADL). In about 50% of the cases impaired cognitive function is diagnosed and over one-third of the patients exhibit psychological symptoms such as depression or anxiety.^{2,3} Family carers of stroke patients are also found to suffer from increased emotional distress.⁴ This can be attributed on the one hand to the strain of caring itself;⁵ additionally, personality changes in the patient of a depressive or aggressive nature represent a particularly heavy psychological burden for the carers.⁶ Several studies have established that family carers request support from professionals, both as regards caring itself and also in helping them to cope with emotional and psychological problems.^{4–8}

In order to minimize the problems of home care and thereby to reduce the burden on the family carers, an optimized concept for the transition from inpatient neurological rehabilitation to home care has been developed at the Rehabilitation Clinic in Herzogenaurach.⁹

The running of a controlled study seemed to be an appropriate method for assessing the effects of an intensified transition. The following hypotheses were tested:

- Six months after their discharge from inpatient neurological rehabilitation, stroke patients in the intervention group have better physical function than patients in the control group (patient-related hypothesis).
- Six months after the patients' discharge family carers of members of the intervention group exhibit better general health (both emotional and physical) than family carers of members of the control group (carer-related hypothesis).

Methods

Transition concepts at the rehabilitation clinic

The standard transition comprised:

- advice and practical help with filing the applications for social service assistance, including the administrative demands of the nursing care insurance (classification of the degree of necessary help);
- mediation of self-help groups (e.g., for patients with aphasia) and support groups for carers by the clinic's social workers;
- allowing family carers to watch therapy sessions (e.g., in logopaedics) and advising them on therapy-related issues;
- one brief care advice for family carers by nurses before discharge (e.g., transfer from bed to wheelchair);
- application for the necessary nursing aids (e.g., wheelchair) to the nursing care insurance;
- forwarding a care relocation report to the nursing service, which assists the family carers later on.

The *intensified transition* included four additional elements: a psycho-educational seminar for family carers; an individual training course for carers; therapeutic weekend care at home before discharge; and finally telephone counselling three months after discharge.⁹

- In the *psycho-educational seminar* (one session, duration 1 h), family carers were supplied with information about caregiving at home, about the burden to be expected, and about sources of assistance such as outpatient care services and self-help groups.
- In the *individual training course* (three sessions, duration 45–60 min each), nurses at the patient's bedside familiarized family carers with those elements of the individual care programme which must be continued at home later on. Information was given on the process of care and how to avoid common caregiving mistakes. The early acquisition of appropriate skills may help to reduce carer burden.
- The purpose of the *therapeutic weekend care* was to send the patient home for a weekend before discharge; as a prerequisite the patient

was to be accompanied and monitored by an outpatient care service. The actual care conditions within the home were then tested with the help of professional carers. This measure enabled the family carers to show their caregiving competence and they received assistance in checking to what extent adaptations of the home environment were necessary. The results were noted on standardized checklists and reported back to the clinic. This made provision for the fine-tuning of further rehabilitation and transition measures. An early review of the home care situation by professionals frequently facilitates the detection of problems which can often not be predicted during the inpatient rehabilitation.¹⁰

- Three months after the patient's discharge the situation in the home environment was assessed by means of *telephone counselling* initiated by the clinic itself, and if problems had arisen, assistance was offered. Assistance initiated by the clinic has been shown to be needed more than advice offered on demand.⁸

Design

The study was established as a controlled clinical trial with a follow-up assessment six months after discharge. The patients coming from the Nuremberg–Fuerth–Erlangen conurbation (population: 1 million) were recruited during a nine-month period from April to December 2002 at the clinic in Herzogenaurach (Bavaria, Germany). Only patients who had suffered a haemorrhagic or ischaemic stroke causing a substantial functional deficit (phase C according to the classification of the German Federal Rehabilitation Council (BAR)¹¹) and who required treatment in a rehabilitation clinic after the acute phase were included in the study (principal inclusion criterion).

At the time of registration in the clinic, the patients were distributed on two study wards, which were comparable in terms of size, staff and equipment. The qualities of therapists and nurses on both wards were identical (each with three physicians, 12 posts for further therapists, e.g., seven physiotherapists, as well as 17.8 nurses' posts on ward I and 17.7 nurses' posts on ward II, each including 12.6 posts of examined nurses). The allocation of the patients to the two wards took place without any influence from the clinic.

Allocation depended purely on when the patient was admitted – the rehabilitation patient was allocated to whichever ward had a vacancy.

In the first ward, the standard transition was applied (control group); in the second, the intensified transition concept was implemented in addition (intervention group). Three to ten days before discharge the subsidiary inclusion and exclusion criteria were tested (see Figure 1). After this test the ward physicians obtained the informed consent of the patients and of the family carers. At this point the final inclusion was decided on. At the time of discharge (T0), the data of the patients and the family carers were collected (see Figure 1). Four weeks after discharge a letter containing a questionnaire was sent to the carers (T1). Six months after discharge (T2), the patients and their carers were examined and questioned at home.

The examination and the assessment of the patients at points T0 and T2 were carried out by a male nurse, who was qualified in neurology and rehabilitation. He was trained in each measurement. The examination at T0 was performed in a separate room, so that the tester could not know which ward the patient came from. The data collected were immediately forwarded to the monitoring person, so that the tester himself had no access to the initial data at the time of the follow-up examination.

The investigation was authorized by the Ethics Commission of the Faculty of Medicine of the University of Erlangen-Nuremberg (application no. 2547).

Subjects

Seventy-one stroke patients fulfilled the final inclusion criteria. During the observation period nine patients dropped out (see Figure 1). Finally, 62 patients were examined in their home environment (follow-up sample). The sociodemographic data of the patients and carers demonstrate no significant group difference (Table 1).

Measurements

Patient-based assessment (examination and assessment)

The functional status of the patients with regard to dependence on help was assessed by using the Barthel Index¹² and the FIM (Functional Inde-

Figure 1 Flowchart for the study. ^a Intervention group: standard transition and additionally (a) therapeutic weekend care at home before discharge, (b) individual training course for family carers, (c) psycho-educational seminar for family carers, (d) telephone counselling three months after discharge. ^b Control group: standard transition.

pendence Measure).¹³ These measures were complemented by the assessment of the patients' standardized mobility via the Timed Up and Go Test (standing up from a sedentary position without human assistance but using necessary aids).¹⁴ The presence or absence of spastic paresis was

recorded using the Ashworth Spastic Scale as modified by Bohannon and Smith.¹⁵ The functionality of the upper extremities was tested with the Frenchay Arm Test.¹⁶ The health-related quality of life of the patients was measured using the SF-36.¹⁷ In the questionnaire on the physical status of the

Table 1 Characteristics of intervention (I) and control (C) group

Characteristics	I-Group (n = 33)	C-Group (n = 29)	p (two-tailed)
Patients			
Age (mean $\pm$ SD)	71.4 $\pm$ 8.2	74.4 $\pm$ 7.8	0.152 ^a
Female	13 (39%)	8 (28%)	0.327 ^b
Carers			
Age (mean $\pm$ SD)	59.7 $\pm$ 9.8	59.4 $\pm$ 9.5	0.907 ^a
Female	25 (76%)	21 (72%)	0.764 ^b
Relation to patient			
Partner	22 (67%)	22 (76%)	
Child	7 (21%)	7 (24%)	
Other	4 (12%)	0	0.153 ^b

^a *t*-test.^b Chi-squared test.

patients, the loss of motor function and sensibility as well as disturbance in gait was registered. Additionally, the use of public health resources was documented (support by physicians or nursing services, drugs).

Carer-based assessment (self-assessment)

Twenty-four somatic complaints of the carers were assessed by means of the short version of the Giessen Symptom List (GSL-24).¹⁸ For the standardization sample (representative sample of the adult normal population, $n = 1601$) the resulting Cronbach's alpha is 0.91.

The Zerssen Depression Scale (D-S)¹⁹ uses 16 items for the self-assessment of depressive symptoms. For the standardization sample (representative sample of the adult normal population, $n = 1700$), the resulting parallel test reliability is 0.76.

The Burden Scale for Family Caregivers (BSFC)²⁰ consists of 28 items which measure the subjective burden on the family carer. The sum score is a measure for the subjective burden of family carers. It expresses how urgently relief is required. The test-retest reliability (repeat measurement after 14 days) is 0.94.²⁰

Statistical methods and analysis

All statistical analyses were computed by using the Statistical Package for Social Sciences (SPSS version 12.0 for Windows). In testing the patient-related hypothesis the *t*-test was used to analyse

the difference between follow-up and baseline for significance between intervention and control groups.

In the carer-related analysis a potential gender and age effect is already taken into account in the percentile norms of the GSL-24 and the D-S. These ordinal scaled variables were checked for significance between the two groups using the Mann-Whitney test.

Dichotomous variables were checked for significant changes using the McNemar test. In the case of variables with three values, the marginal homogeneity test was applied to test for significant changes.

The level of significance was fixed at $p = 0.05$. *p*-values of between 0.05 and 0.10 are considered as representing trends.

Results

The stroke patients of the intervention group stayed on average 11 days longer in the rehabilitation clinic than control group patients (64 ± 20 versus 53 ± 15 days, $p = 0.014$). At baseline there was no other significant difference between the intervention and control group (Tables 2 and 3).

In testing the patient-related hypothesis, neither mean change scores of the Barthel index nor of the FIM showed a significant difference between intervention and control group (Table 2). Therefore the null hypothesis will be accepted: six months after discharge from inpatient neurological rehabilitation stroke patients in the intervention group have no better physical function than control group patients. In comparison to baseline the scores of the Barthel Index and of the FIM were increased at follow-up assessment in both groups: patients become less dependent on help in the six months following discharge (Table 2). An increase in the emotional quality of life could also be determined (Table 2). The measures of physical mobility show an advantage for the patients of the intervention group: the Timed Up and Go Test could be performed significantly more often for patients in the intervention group than in the control group six months after discharge. Major disturbances in the patients' gait were more frequent in the control group (Table 2) though

Table 2 Patient data (intervention (I) versus control (C) group)

Parameter	I-Group (n = 33) ^a			C-Group (n = 29) ^a			Between groups		p (two-tailed)
	Baseline (T0)	Follow-up (T2)	Difference (T2-T0)	Baseline (T0)	Follow-up (T2)	Difference (T2-T0)	Baseline (T0)	Follow-up (T2)	
Barthel Index	66.1 ± 14.3	77.4 ± 17.9	11.4 ± 14.1	62.8 ± 21.7	74.0 ± 23.5	11.2 ± 16.4	0.489 ^b	0.514 ^b	0.968 ^b
FIM	89.7 ± 14.2	92.2 ± 14.0	2.5 ± 12.9	84.9 ± 22.0	92.3 ± 17.5	7.4 ± 12.2	0.322 ^b	0.947 ^b	0.129 ^b
Frenchay Arm Test	2.9 ± 2.3	3.2 ± 2.2	0.3 ± 1.5	3.5 ± 2.1	3.7 ± 1.9	0.2 ± 0.8	0.261 ^b	0.345 ^b	0.679 ^b
Ashworth Spastic Scale	1.4 ± 1.2	1.7 ± 1.5	0.3 ± 1.0	1.3 ± 1.3	1.3 ± 1.4	0.0 ± 1.0	0.715 ^b	0.297 ^b	0.270 ^b
SF-36 ^c	31.7 ± 6.0	30.5 ± 6.9	-1.1 ± 9.4	31.7 ± 8.1	31.7 ± 8.9	0.0 ± 11.9	0.336 ^b	0.561 ^b	0.663 ^b
SF-36 ^e	48.7 ± 12.1	47.2 ± 12.4	-1.5 ± 11.5	48.7 ± 10.7	43.3 ± 14.7	-5.4 ± 15.9	0.511 ^b	0.258 ^b	0.261 ^b
Timed Up and Go Test (possible) ^f	26 (79%)	31 (94%)		23 (79%)	22 (76%)				
Pareses (upper extremity)	25 (76%)	24 (73%)		21 (72%)	22 (76%)		0.960 ^c	0.044^c	
Pareses (lower extremity)	27 (82%)	26 (79%)		23 (79%)	23 (79%)		0.764 ^c	0.778 ^c	
							0.803 ^c	0.960 ^c	
Gait disturbance									
None	4 (12%)	6 (18%)		5 (17%)	5 (17%)				
Minor ^g	29 (88%)	26 (79%)		24 (83%)	20 (69%)				
Major ^h	0 (0%)	1 (3%)		0 (0%)	4 (14%)				
							0.568 ^c	0.297 ^c	

SF-36^c, physical sum-score of the SF-36; SF-36^e, emotional sum-score of the SF-36.^aFigures are means ± SD.^bt-test.^cChi-squared test.^dMcNemar test.^eMarginal homogeneity test.^fNumber of patients capable of getting to feet alone.^gMinor disturbance in gait: unsure gait, falls seldom (maximum twice in last four weeks) and without subsequent injury.^hMajor disturbance in gait: frequent falls (more than two falls in the last four weeks) or falls with subsequent injury.

Table 3 Caregiver-related data (intervention (I) versus control (C) group)

Parameter	I-Group (<i>n</i> = 33) ^a		C-Group (<i>n</i> = 29) ^a		Between groups		<i>p</i> (two-tailed)
	Baseline (T0)	Follow-up (T2)	Difference (T2-T0)	Baseline (T0)	Follow-up (T2)	Difference (T2-T0)	
GSL sum score (PR)	35.3 ± 25.7	43.1 ± 30.5	7.9 ± 28.1	42.5 ± 30.3	53.6 ± 29.3	11.1 ± 29.8	0.670 ^b
D-S sum score (PR)	60.0 ± 31.9	65.3 ± 32.5	5.3 ± 26.2	69.4 ± 27.1	64.0 ± 29.8	-5.4 ± 32.9	0.153 ^b

PR percentile rank; GSL, Giessen symptom list;¹⁸ D-S, Depression Scale.¹⁹^aFigures are means ± SD.^bMann-Whitney test.

not to a statistically significant level. Pareses of arms and legs persisted between baseline and follow-up assessment (Table 2).

In testing the carer-related hypothesis, neither mean change scores of the GSL (physical complaints) nor of the D-S (depressive symptoms) showed a significant difference between intervention and control group (Table 3). Therefore the null hypothesis will be accepted: Six months after the patients' discharge family carers in the intervention group exhibit no better physical or emotional health than control group carers. While an increase in the physical complaints of the family carers within the first six months following discharge of the patient was found in both groups, no change in depressive symptoms was seen (Table 3).

Referring to the caring situation, the change in the mean number of physician visits between baseline (here four weeks after discharge) and follow-up (six months after discharge) revealed a significant difference between intervention and control group ($p = 0.018$). No significant group differences were detected either in the change in the number of prescribed drugs or in the subjective burden of family carers (Table 4).

Four weeks after discharge patients in the control group showed significantly more new illnesses than patients in the intervention group (7 (24%) versus 2 (6%), $p = 0.044$). These illnesses were in the majority of cases respiratory or systemic circulatory diseases. The number of new illnesses arising in the following five months of the observation period was not significantly different (6 (21%) in the control group versus 5 (15%) in the intervention group).

Deterioration in the home care situation, as evinced by readmission of the patient into hospital or by deterioration in the general state of the patient's health, was found equally frequently in both groups, namely two cases (7%) in the control group and three cases (9%) in the intervention group in the first four weeks after discharge. In the following five months, the rate was 28% in both groups (eight versus nine cases respectively). Complications related to the care itself (in four out of six cases problems with permanent catheters) increased only in the control group from one (3%) to four cases (14%).

Whereas half of the intervention group made use of an outpatient care service in their home care,

only one-third of the control group used outside assistance of this type.

Contacts with nonmedical therapists were at a significantly lower level ($p < 0.0005$, McNemar test) for both groups six months after discharge compared with inpatient rehabilitation (Table 5). At the time of the follow-up assessment only the aid of an occupational therapist was used significantly more frequently by patients in the intervention group than those in the control group ($p = 0.038$).

Discussion

The control study with a follow-up assessment after six months investigated effects of intensified transition between inpatient neurological rehabilitation and home care. Two hypotheses were tested and additional exploratory data were collected. In order to achieve evidence-based results the study was performed as a controlled trial. The situation of stroke patients and their family carers was registered, considering their physical and emotional health, their quality of life and their use of public health resources. Valid scales with representative norms (GSL-24 and D-S) were used for measurement. The assessment of both groups at baseline and follow-up was conducted by only one trained examiner, in order to preclude inter-rater reliability problems. To blind the measurements as much as possible, the examination before discharge was performed in a room not related to either ward.

The limitations of the study are determined by the numbers of cases investigated ($n = 62$), a larger number of patients may improve the evaluation of group differences. Additionally, the observation period was limited to six months, thus excluding the long-term effects. The allocation of the patients to the test groups was not guided in any way, but depended simply on beds in either ward becoming available as the patients were admitted. A truly random allocation of the patients would have involved considerable financial expense, as beds would have had to be kept free on both wards for the entire recruiting period.

Controlled studies of transition and aftercare concepts previously investigated the outcome vari-

Table 4 Data related to the care situation (intervention (I) versus control (C) group)

Parameter	I-Group (n = 33) ^a		C-Group (n = 29) ^a		Between groups		p (two-tailed)
	Baseline (T1)	Follow-up (T2)	Difference (T2-T1)	Baseline (T1)	Follow-up (T2)	Difference (T2-T1)	
Number of physician visits ^e	2.6 ± 1.5	2.0 ± 1.5	-0.6 ± 1.6	2.1 ± 1.6	2.9 ± 2.4	0.8 ± 2.5	0.018^b
Change in number of drugs ^{e,g}	0.15 ± 1.1	0.21 ± 0.9	0.06 ± 1.3	0.48 ± 1.5	0.17 ± 0.9	-0.31 ± 1.7	0.326 ^b
BSFC	74.6 ± 8.9	74.4 ± 8.8	-0.2 ± 8.6	72.8 ± 11.1	72.7 ± 9.0	-0.1 ± 10.8	0.454 ^b
Newly appearing illnesses ^h	2 (6%) ^e	5 (15%) ^f		7 (24%) ^e	6 (21%) ^f		0.980 ^b
Deterioration in home care ⁱ	3 (9%) ^e	9 (28%) ^f		2 (7%) ^e	8 (28%) ^f		0.569 ^c
Care-related complications ^j	0 (0%) ^d	1 (3%) ^f		1 (3%) ^e	4 (14%) ^f		0.963 ^c
Use of outpatient care services	15 (46%) ^e	17 (52%) ^f		9 (31%) ^e	9 (31%) ^f		0.120 ^c
							0.103 ^c

BSFC, Burden Scale for Family Caregivers.²⁰^a Figures are means ± SD.^b t-Test.^c Chi-squared test.^d McNemar test.^e Time window 4 weeks before questioning.^f Time window 5 months before questioning.^g Difference between number of newly prescribed drugs and those discontinued.^h Predominantly respiratory and systemic circulatory diseases.ⁱ Readmission of the patient into hospital or deterioration of general condition.^j Predominantly problems with permanent catheter.

Table 5 Nondrug therapies (intervention (I) versus control (C) group)

Therapy	I-Group (n = 33)		C-Group (n = 29)		Between groups p (two-tailed)	
	Baseline (T0)	Follow-up (T2)	Baseline (T0)	Follow-up (T2)	Baseline (T0)	Follow-up (T2)
Occupational therapy	33 (100%)	13 (39%) ^a	29 (100%)	3 (11%) ^a	const.	0.038^b
Physiotherapy	33 (100%)	20 (61%) ^a	29 (100%)	18 (61%) ^a	const.	0.997 ^b
Speech therapy	26 (79%)	7 (21%) ^a	23 (79%)	4 (14%) ^a	0.960 ^b	0.729 ^b
Physical therapy ^c	33 (100%)	6 (18%) ^a	29 (100%)	8 (28%) ^a	const.	0.559 ^b

^aTime window 6 months following discharge.^bChi-square test.^cMassage, packs, electrotherapy.

Const., no difference since all patients received the treatment.

ables of either patients or family carers, but not both together. Andersen *et al.*²¹ tested the effects of two different aftercare concepts on the functional status of 155 stroke patients in comparison with a control group (measures were only taken after discharge). Two, six and twelve weeks after discharge one-third of the patients were visited by a physician whose task was to discover problems in early stages, to maintain the functional abilities of the patient and to adjust the home situation (aftercare concept 1). Another third of the patients received physiotherapist instruction at the patient's home about indoor and outdoor mobility (aftercare concept 2). In the last third, a standard transition was practised without follow-up home visits. Six months after discharge from the inpatient rehabilitation, the functional disability was measured with the Barthel Index. There was no significant difference between the three groups.

Heier *et al.*⁷ investigated the effects of an intensified preparation of the family carers on the quality of care on stroke patients. The intervention group, consisting of 42 family carers, attended a training course of 10 weekly lessons. The participants were instructed in dealing with stroke patients, were informed about stroke, and learnt caring techniques to reduce their burden. The control group included 43 family carers. The emotional and physical well-being of the carers was checked before the seminar began, and five and ten months later. At the end of the study, the intervention group proved themselves more knowledgeable about stroke compared to the control group. In addition they made more use of health services. There was no significant change in the emotional and physical well-being of family carers in both groups.

In contrast to the aftercare concepts developed by Andersen *et al.*,²¹ the study reported here started the intervention measures, such as 'therapeutic weekend care' and bedside teaching *during* the inpatient rehabilitation, in order to prepare the home care and to prevent possible problems at an early stage. In comparison to Heier *et al.*'s⁷ psycho-educational seminar, this intervention concept offered only one information lesson but an additional three to four bedside teaching units.

The investigated intensified concept did not lead to a significant advantage either for the functional status and quality of life of the stroke patients or for the health and burden of care of family carers. Neither the aftercare concept nor the transition concept of the two cited studies showed any kind of breakthrough effect, which is also true of the intensified transition investigated in this study. This may on the one hand have something to do with the fact that the standard transition already contains effective elements of preparation for home care and that therefore no further decisive advantage can be attained. On the other hand, it is

Clinical messages

- The various accepted methods of transition from rehabilitation to home care do not fundamentally differ in their effects on the patient's functional status.
- An intensive transition led to increased uptake of outpatient services.
- This offers a potential opportunity to reduce the frequency of care-related complications at home.

crucial to recognize that not every relevant effect can be detected with sum scales.

With regard to the care situation and the contact with outpatient care services important effects of the intensified transition were found. The results demonstrate that patients and their family carers make earlier and more intensive use of the public health resources following an intensified transition. Physician visits started earlier and then decreased noticeably, whereas it was vice versa in the control group. Outpatient care services and occupational therapy were more extensively used in the intervention group. This could have been responsible for the fact that in the intervention group the frequency of care-related complications did not increase, that new illnesses occurred later, that more stroke patients could get up without personal help six months after discharge, and that major gait disturbances remained rare. These important advantages must be set against the on average longer stay in the rehabilitation clinic. This resulted mainly from the more intensive preparation of the stroke patients for home care following the feedback information of the therapeutic week-end care.

In fact, the basic transition methods applied in both groups were shown to be effective, since the functional status increased in both groups, though the use of nondrug therapies decreased significantly. The treatment with physiotherapy remained at a high level in both groups. This may have played a role in the stabilization of the functional status in the total sample.

Future studies should investigate whether the advantages of the intensified transition can also be achieved with the same duration of inpatient rehabilitation. Long-term effects (over six months) on the minimization of disease and care-related complications could probably be achieved by means of intensified transition methods including the appropriate use of outpatient therapies and services. Those hypothesized effects should also be examined in terms of a cost-benefit analysis.

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